Journal of Physical and Chemical Reference Data

Tables of Elastic Scattering Cross Sections of Photons in the Energy Range 50–1500 keV for All Elements in the Range $13 \leqslant Z \leqslant 104$

Cite as: Journal of Physical and Chemical Reference Data **27**, 1011 (1998); https://doi.org/10.1063/1.556027
Submitted: 09 June 1997 . Published Online: 15 October 2009

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Tables of Elastic Scattering Cross Sections of Photons in the Energy Range 50–1500 keV for All Elements in the Range $13 \leqslant Z \leqslant 104$

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Received June 9, 1997; final manuscript received August 12, 1998

Tables of differential and total elastic scattering cross sections for 92 elements in the atomic number range $13 \leqslant Z \leqslant 104$ and for selected photon energies in the range 50–1500 keV have been presented. The energies are chosen to cover the most commonly used photon energies and in a suitable grid so as to enable one to use the usual interpolation methods to determine cross sections for any other energies in this energy range. The available experimental results are also compared with the tabulated values and the difference is presented graphically. © *1998 American Institute of Physics and American Chemical Society.* [S0047-2689(98)00306-7]

Key words: cross section, elastic scattering, form factor, gamma rays, interpolation, Rayleigh scattering, *S*-matrix, x rays.

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1. Introduction and Nomenclature

1.1. Introduction

The elastic scattering of photons is one of the fundamental modes of interaction of photons with matter and has been an object of vigorous investigations for quite a long time. The tables of precise elastic scattering cross sections for any element and for varying photon energies have long been needed not only from the point of view of this importance in fundamental science but also from the point of view of their applications in various fields such as material study, health physics, biology, medicine, etc. Such tabulated values of differential elastic scattering cross sections are available for elements $1 \leqslant Z \leqslant 100$ using the form factor theory.[1–3] Although these tables have been found to be extremely useful and widely used, they are derived using approximate theories and therefore have their own limitations. In recent years, a numerical method to estimate Rayleigh scattering amplitudes (the elastic scattering of photons by bound electrons which is predominant in the energy region of our interest) within an accuracy of the order of 1% has been developed.[4] At the present time this happens to be the state-of-the-art method for estimating the most precise cross sections. However, in view of its requirement of large computer CPU time (particularly as one approaches photon energies away from the binding energies of a given electronic subshell and for high Z atoms due to its large number of subshells), published cross-section values available are fragmentary: namely, for ten elements and for seven selected photon energies.[5] The need for publishing tables of elastic scattering cross sections for all elements of the periodic table and at least for a selected photon energy range in a suitable fine grid of scattering angles by interpolation from the available published accurate values of cross section has long been felt.[6] Recently, we have been able to interpolate quite accurately in three dimensions (in terms of Z, photon energy E and scattering angle θ) from the published elastic scattering cross sections obtained using S-matrix formalism.[5] Sample tabulations for 16 new elements have been reported in the Indo–US Workshop on Radiation Physics held in March 1996.[7] In this paper, are tables of differential elastic scattering cross sections for elements in the range $13 \leqslant Z \leqslant 104$ and for 14 photon energies (50.0, 59.54, 145.4, 316.5, 411.8, 468.1, 661.6, 778.9, 964.0, 1004.8, 1112.1, 1274.5, 1408.0 and 1500 keV) in the range 50–1500 keV for 55 different scattering angles in the range $0 \leqslant \theta \leqslant 180$. Angles are chosen judiciously, very close angular grids (namely, 14 angles between 0° and 1°) due to the sharp variation of cross sections at forward angles and at relatively coarser grids with increasing scattering angles. On one hand while energies are chosen in such a way that one can use the usual interpolation methods to obtain cross sections for any energy in between and commonly used photon energies, on the other, they are chosen to enable us to compare our results with experiments. Angle integrated elastic scattering cross sections are also presented in the tables for all these elements and energies.

Before presenting tables, salient features of the form factor theory and the S-matrix formalism are presented in Sec. 2. The present method of tabulation will be described in Sec. 3. In Sec. 4, we will discuss a comparison of experimental values with our predicted values.

1.2. Nomenclature

A	total scattering amplitude
A^{R}	Rayleigh scattering amplitude
A^{T}	nuclear Thomson scattering amplitude
A^{D}	Delbruck scattering amplitude
A^{NR}	nuclear resonance amplitude
$\frac{\mathrm{d}\sigma^T}{\mathrm{d}\Omega}$	differential Thomson scattering cross section
r_0	classical electron radius $=e^2/mc^2$ $=2.817\ 938\ 0\times10^{-15}$ m
θ	scattering angle
f	form factor
q	momentum transfer in units of mc $=(2E/c)\sin(\theta/2)$
c	velocity of light$=2.997\ 924\ 58\times10^{8}$ ms^{-1}
e	elementary charge $=1.602\ 189\ 2\times10^{-19}$ C
ρ	electronic charge density
m	rest mass of electron $=9.109\ 534\times10^{-31}$ kg
ω	angular frequency of photon $=2\pi c/\lambda$
λ	wavelength of photon in Å^{-1}
ψ_n	wave function of the electron in the nth state
E_n	total energy of the nth electron
$V(r)$	effective atomic potential
g	modified form factor
g_n	modified form factor for the nth shell electron
$\frac{\mathrm{d}\sigma}{\mathrm{d}\Omega}$	differential scattering cross section
Z	atomic number
x	momentum transfer in Å^{-1}
$\hbar$	$h/2\pi=1.054\ 589\times10^{-34}$ J s
h	Planck's constant $=6.626\ 176\times10^{-34}$ J s

2. Elastic Scattering

2.1. Introduction

In elastic scattering, a photon is deflected from its original path by an atom without any change in its energy and without any change in the internal degrees of freedom of the atomic system. Since an atom consists of electrons and the nucleus, it is justifiable to consider the elastic scattering of photons by atom as a coherent sum of contributions from the

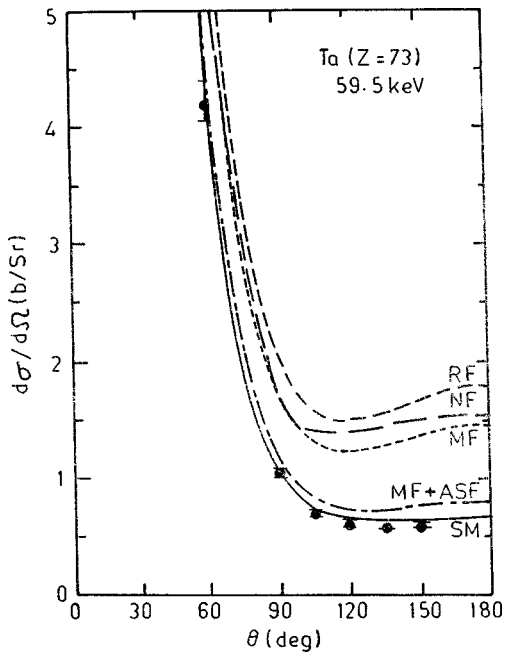

FIG. 1. Comparison of experimental results with the S matrix and different form factors for Ta at 59.5 keV: (NF) nonrelativistic form factor, (RF) relativistic form factor, (MF) modified form factor, and (MF+ASF) modified form factor with anomalous scattering factors

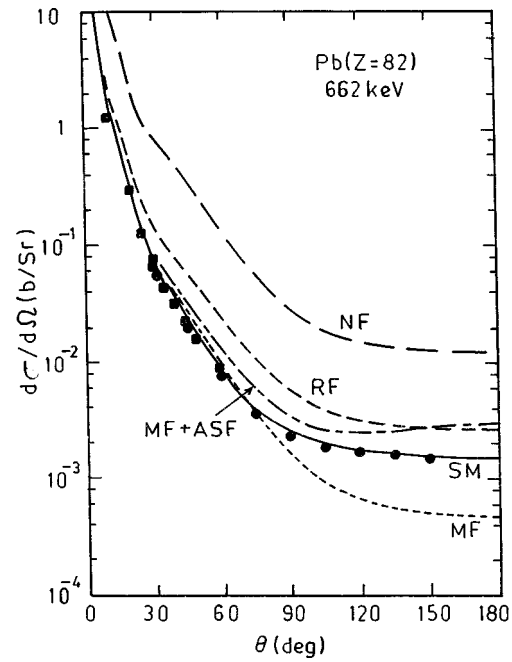

FIG. 3. Comparison of experimental results with the S matrix and different form factors for Pb at 661.6 keV: (NF) nonrelativistic form factor, (RF) relativistic form factor, (MF) modified form factor, and (MF+ASF) modified form factor with anomalous scattering factors.

nucleus (nuclear Thomson scattering, nuclear resonance scattering), from the bound electrons (Rayleigh scattering) and contributions from quantum electrodynamics (QED) effects (Delbruck scattering). Therefore, the total scattering amplitude will be the sum of the amplitudes of the different components:

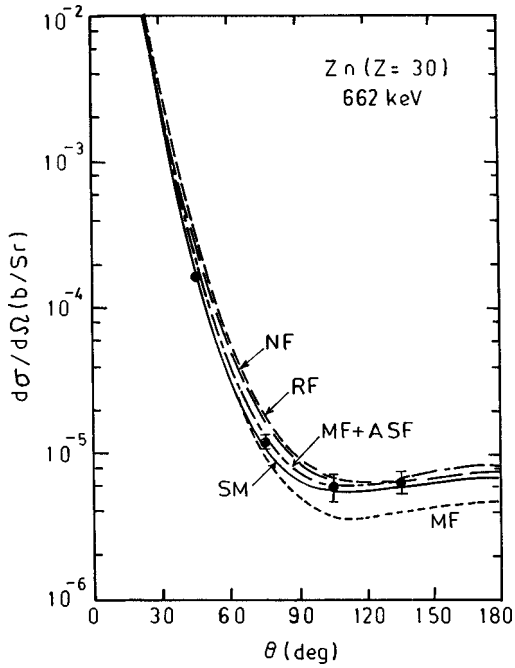

FIG. 2. Comparison of experimental results with the S matrix and different form factors for Zn at 661.6 keV: (NF) nonrelativistic form factor, (RF) relativistic form factor, (MF) modified form factor, and (MF+ASF) modified form factor with anomalous scattering factors.

$$A = A^{R} + A^{T} + A^{D} + A^{NR}, \tag{1}$$

where A^{R}, A^{T}, A^{D}, and A^{NR} represent Rayleigh, nuclear Thomson, Delbruck and nuclear resonance amplitude, respectively. It should be noted in this connection that the scattering amplitude is a complex quantity; its real part corresponds to dispersion while its imaginary part corresponds to absorption.

In general, Rayleigh scattering is predominant at lower photon energies, while nuclear Thomson scattering is important with increasing the atomic number (Z) of the target and is relatively important compared to Rayleigh scattering at large angle of scattering and high photon energy. Nuclear resonance and QED effects become important at higher photon energies. In the energy range of our interest, the nuclear resonance amplitude is several orders of magnitude less than the Rayleigh amplitude for all elements and can be neglected. The Delbruck amplitude is usually several orders of magnitude lower than the Rayleigh amplitudes, but appears at energies around 700 keV for high Z elements at large scattering angles (for highest Z, highest energy of this present work and at back angles the Delbruck amplitude is about an order less than the corresponding Rayleigh amplitude). The nuclear Thomson amplitude is about three orders of magnitude lower than the corresponding Rayleigh amplitudes for highest Z elements at 50 keV and is only comparable at 1500 keV at large scattering angles. Interested readers are referred to the review article[5] in which the relative contributions from different elastic processes are presented graphically. The present tabulations of elastic scattering in-

TABLE 1. Predicted *S*-matrix differential elastic scattering cross sections for photon energies (50.0, 59.54, 145.4, 316.5, 411.8, 468.1, 661.6, 778.9, 964.0, 1004.8, 1112.1, 1274.5, 1408.0 and 1500.0). The angle integrated total cross sections for each element and energies are presented. ''total'' represents total cross sections from this work, ''rel ff'' represents total cross sections calculated from the relativistic form factor, and ''nrl ff'' represents total cross sections calculated from the nonrelativistic form factor.[a]

θ (deg)	Photon energy (keV)						
	50.0	59.5	145.4	316.5	411.8	468.1	661.6
Aluminum ($Z=13$)							
0.00	1.34E+01	1.34E+01	1.34E+01	1.34E+01	1.34E+01	1.34E+01	1.34E+01
0.01	1.34E+01	1.34E+01	1.34E+01	1.34E+01	1.34E+01	1.34E+01	1.34E+01
0.02	1.34E+01	1.34E+01	1.34E+01	1.34E+01	1.34E+01	1.34E+01	1.33E+01
0.04	1.34E+01	1.34E+01	1.34E+01	1.33E+01	1.33E+01	1.33E+01	1.32E+01
0.06	1.34E+01	1.34E+01	1.34E+01	1.33E+01	1.32E+01	1.32E+01	1.29E+01
0.10	1.34E+01	1.34E+01	1.33E+01	1.31E+01	1.29E+01	1.28E+01	1.22E+01
0.20	1.34E+01	1.34E+01	1.31E+01	1.23E+01	1.17E+01	1.13E+01	1.00E+01
0.30	1.34E+01	1.33E+01	1.28E+01	1.12E+01	1.03E+01	9.76E+00	8.19E+00
0.40	1.33E+01	1.32E+01	1.24E+01	1.02E+01	9.04E+00	8.47E+00	6.92E+00
0.50	1.32E+01	1.31E+01	1.20E+01	9.23E+00	8.03E+00	7.46E+00	5.97E+00
0.60	1.32E+01	1.30E+01	1.15E+01	8.41E+00	7.22E+00	6.66E+00	5.21E+00
0.70	1.31E+01	1.29E+01	1.10E+01	7.71E+00	6.55E+00	6.00E+00	4.53E+00
0.80	1.30E+01	1.27E+01	1.05E+01	7.11E+00	5.99E+00	5.44E+00	3.93E+00
1.00	1.28E+01	1.24E+01	9.59E+00	6.15E+00	5.05E+00	4.47E+00	2.87E+00
1.20	1.25E+01	1.20E+01	8.77E+00	5.37E+00	4.24E+00	3.63E+00	2.03E+00
1.50	1.20E+01	1.14E+01	7.75E+00	4.40E+00	3.19E+00	2.58E+00	1.19E+00
1.70	1.17E+01	1.10E+01	7.20E+00	3.82E+00	2.60E+00	2.02E+00	8.42E−01
2.00	1.11E+01	1.04E+01	6.50E+00	3.06E+00	1.88E+00	1.39E+00	5.27E−01
2.50	1.01E+01	9.50E+00	5.56E+00	2.04E+00	1.08E+00	7.65E−01	2.90E−01
3.00	9.25E+00	8.67E+00	4.78E+00	1.34E+00	6.43E−01	4.55E−01	1.97E−01
3.50	8.51E+00	7.97E+00	4.09E+00	8.90E−01	4.14E−01	3.00E−01	1.52E−01
4.00	7.89E+00	7.37E+00	3.46E+00	6.11E−01	2.92E−01	2.18E−01	1.24E−01
5.00	7.00E+00	6.40E+00	2.40E+00	3.29E−01	1.84E−01	1.44E−01	8.57E−02
6.00	6.41E+00	5.63E+00	1.63E+00	2.12E−01	1.37E−01	1.09E−01	5.71E−02
7.00	5.96E+00	4.97E+00	1.10E+00	1.57E−01	1.09E−01	8.50E−02	3.67E−02
8.00	5.56E+00	4.37E+00	7.54E−01	1.26E−01	8.60E−02	6.49E−02	2.31E−02
9.00	5.13E+00	3.83E+00	5.36E−01	1.05E−01	6.71E−02	4.84E−02	1.44E−02
10.00	4.64E+00	3.33E+00	3.97E−01	8.83E−02	5.15E−02	3.54E−02	8.99E−03
12.50	3.33E+00	2.28E+00	2.28E−01	5.56E−02	2.53E−02	1.56E−02	2.89E−03
15.00	2.19E+00	1.52E+00	1.62E−01	3.31E−02	1.21E−02	6.78E−03	1.01E−03
17.50	1.40E+00	1.01E+00	1.26E−01	1.90E−02	5.86E−03	3.04E−03	3.90E−04
20.00	9.04E−01	6.85E−01	1.02E−01	1.08E−02	2.90E−03	1.42E−03	1.65E−04
22.50	6.11E−01	4.83E−01	8.19E−02	6.18E−03	1.49E−03	6.99E−04	7.64E−05
25.00	4.36E−01	3.55E−01	6.52E−02	3.57E−03	7.92E−04	3.60E−04	3.84E−05
27.50	3.29E−01	2.74E−01	5.12E−02	2.10E−03	4.37E−04	1.95E−04	2.09E−05
30.00	2.63E−01	2.20E−01	3.98E−02	1.27E−03	2.51E−04	1.10E−04	1.22E−05
35.00	1.89E−01	1.56E−01	2.35E−02	4.89E−04	9.13E−05	4.00E−05	5.09E−06
40.00	1.51E−01	1.20E−01	1.37E−02	2.06E−04	3.79E−05	1.70E−05	2.63E−06
45.00	1.26E−01	9.63E−02	7.99E−03	9.48E−05	1.77E−05	8.29E−06	1.64E−06
50.00	1.07E−01	7.79E−02	4.72E−03	4.72E−05	9.28E−06	4.58E−06	1.16E−06
55.00	9.09E−02	6.31E−02	2.84E−03	2.53E−05	5.36E−06	2.81E−06	9.02E−07
60.00	7.69E−02	5.10E−02	1.75E−03	1.46E−05	3.39E−06	1.89E−06	7.50E−07
65.00	6.49E−02	4.13E−02	1.10E−03	9.05E−06	2.33E−06	1.37E−06	6.51E−07
70.00	5.48E−02	3.36E−02	7.20E−04	5.98E−06	1.71E−06	1.06E−06	5.85E−07
75.00	4.65E−02	2.75E−02	4.85E−04	4.19E−06	1.35E−06	8.80E−07	5.47E−07
80.00	3.98E−02	2.28E−02	3.39E−04	3.11E−06	1.11E−06	7.60E−07	5.16E−07
85.00	3.45E−02	1.92E−02	2.46E−04	2.44E−06	9.64E−07	6.83E−07	4.96E−07
90.00	3.04E−02	1.64E−02	1.85E−04	2.02E−06	8.73E−07	6.41E−07	4.95E−07
95.00	2.72E−02	1.44E−02	1.45E−04	1.74E−06	8.18E−07	6.18E−07	4.99E−07
105.00	2.30E−02	1.17E−02	9.81E−05	1.44E−06	7.78E−07	6.16E−07	5.27E−07
120.00	2.00E−02	9.68E−03	6.72E−05	1.32E−06	8.24E−07	6.85E−07	6.19E−07
135.00	1.89E−02	8.81E−03	5.42E−05	1.35E−06	9.27E−07	7.96E−07	7.40E−07
150.00	1.84E−02	8.41E−03	4.80E−05	1.42E−06	1.04E−06	9.10E−07	8.59E−07
165.00	1.82E−02	8.23E−03	4.52E−05	1.49E−06	1.12E−06	9.94E−07	9.46E−07
180.00	1.82E−02	8.18E−03	4.44E−05	1.51E−06	1.15E−06	1.02E−06	9.77E−07
total	2.04E+00	1.53E+00	2.86E−01	6.25E−02	3.73E−02	2.88E−02	1.45E−02
rel ff	2.09E+00	1.54E+00	2.91E−01	6.35E−02	3.78E−02	2.93E−02	1.47E−02
nrl ff	2.10E+00	1.54E+00	2.91E−01	6.34E−02	3.78E−02	2.93E−02	1.47E−02

TABLE 1. Predicted *S*-matrix differential elastic scattering cross sections for photon energies (50.0, 59.54, 145.4, 316.5, 411.8, 468.1, 661.6, 778.9, 964.0, 1004.8, 1112.1, 1274.5, 1408.0 and 1500.0). The angle integrated total cross sections for each element and energies are presented. ''total'' represents total cross sections from this work, ''rel ff'' represents total cross sections calculated from the relativistic form factor and ''nrl ff'' represents total cross sections calculated from the nonrelativistic form factor—Continued[a]

θ (deg)	Photon energy (keV)						
	778.9	964.0	1004.8	1112.1	1274.5	1408.0	1500.0
Aluminum ($Z=13$)							
0.00	1.34E+01	1.34E+01	1.34E+01	1.34E+01	1.35E+01	1.36E+01	1.37E+01
0.01	1.34E+01	1.34E+01	1.34E+01	1.34E+01	1.35E+01	1.36E+01	1.36E+01
0.02	1.33E+01	1.33E+01	1.33E+01	1.33E+01	1.33E+01	1.34E+01	1.34E+01
0.04	1.31E+01	1.30E+01	1.29E+01	1.29E+01	1.28E+01	1.28E+01	1.28E+01
0.06	1.27E+01	1.25E+01	1.24E+01	1.22E+01	1.21E+01	1.20E+01	1.21E+01
0.10	1.18E+01	1.12E+01	1.11E+01	1.08E+01	1.05E+01	1.04E+01	1.04E+01
0.20	9.29E+00	8.33E+00	8.15E+00	7.73E+00	7.29E+00	7.09E+00	7.06E+00
0.30	7.47E+00	6.51E+00	6.31E+00	5.82E+00	5.09E+00	4.49E+00	4.07E+00
0.40	6.24E+00	5.28E+00	5.07E+00	4.50E+00	3.58E+00	2.79E+00	2.25E+00
0.50	5.30E+00	4.32E+00	4.10E+00	3.51E+00	2.59E+00	1.86E+00	1.40E+00
0.60	4.50E+00	3.49E+00	3.27E+00	2.73E+00	1.94E+00	1.37E+00	1.03E+00
0.70	3.78E+00	2.77E+00	2.57E+00	2.10E+00	1.50E+00	1.10E+00	8.67E−01
0.80	3.14E+00	2.17E+00	2.00E+00	1.61E+00	1.18E+00	9.30E−01	8.01E−01
1.00	2.10E+00	1.30E+00	1.18E+00	9.43E−01	7.49E−01	7.09E−01	7.48E−01
1.20	1.38E+00	7.87E−01	7.09E−01	5.66E−01	4.86E−01	5.35E−01	6.61E−01
1.50	7.55E−01	4.11E−01	3.69E−01	2.98E−01	2.68E−01	3.16E−01	4.13E−01
1.70	5.29E−01	2.93E−01	2.65E−01	2.16E−01	1.91E−01	2.10E−01	2.53E−01
2.00	3.41E−01	2.04E−01	1.86E−01	1.53E−01	1.25E−01	1.13E−01	1.07E−01
2.50	2.05E−01	1.42E−01	1.32E−01	1.10E−01	7.51E−02	4.63E−02	2.89E−02
3.00	1.48E−01	1.10E−01	1.03E−01	8.34E−02	5.04E−02	2.51E−02	1.27E−02
3.50	1.17E−01	8.40E−02	7.77E−02	6.10E−02	3.50E−02	1.70E−02	8.59E−03
4.00	9.39E−02	6.26E−02	5.70E−02	4.32E−02	2.49E−02	1.32E−02	7.57E−03
5.00	5.90E−02	3.29E−02	2.90E−02	2.09E−02	1.32E−02	9.44E−03	7.68E−03
6.00	3.52E−02	1.67E−02	1.44E−02	1.02E−02	7.16E−03	6.67E−03	7.32E−03
7.00	2.03E−02	8.49E−03	7.20E−03	5.03E−03	3.87E−03	4.38E−03	5.95E−03
8.00	1.16E−02	4.40E−03	3.68E−03	2.56E−03	2.11E−03	2.76E−03	4.36E−03
9.00	6.69E−03	2.34E−03	1.94E−03	1.35E−03	1.18E−03	1.73E−03	3.07E−03
10.00	3.90E−03	1.28E−03	1.06E−03	7.37E−04	6.82E−04	1.10E−03	2.15E−03
12.50	1.10E−03	3.26E−04	2.67E−04	1.88E−04	1.92E−04	3.60E−04	8.16E−04
15.00	3.57E−04	9.93E−05	8.12E−05	5.69E−05	5.88E−05	1.12E−04	2.54E−04
17.50	1.32E−04	3.57E−05	2.91E−05	2.00E−05	1.92E−05	3.24E−05	6.48E−05
20.00	5.54E−05	1.50E−05	1.21E−05	8.06E−06	6.79E−06	9.23E−06	1.47E−05
22.50	2.60E−05	7.22E−06	5.83E−06	3.75E−06	2.69E−06	2.77E−06	3.31E−06
25.00	1.36E−05	3.98E−06	3.22E−06	2.02E−06	1.21E−06	9.18E−07	7.97E−07
27.50	7.81E−06	2.48E−06	2.02E−06	1.24E−06	6.29E−07	3.48E−07	2.17E−07
30.00	4.89E−06	1.71E−06	1.41E−06	8.54E−07	3.73E−07	1.53E−07	6.91E−08
35.00	2.39E−06	1.03E−06	8.63E−07	5.21E−07	1.74E−07	4.22E−08	1.08E−08
40.00	1.45E−06	7.67E−07	6.63E−07	4.08E−07	1.16E−07	1.95E−08	3.33E−09
45.00	1.03E−06	6.47E−07	5.73E−07	3.66E−07	9.96E−08	1.44E−08	2.05E−09
50.00	8.16E−07	5.77E−07	5.21E−07	3.44E−07	9.46E−08	1.33E−08	1.82E−09
55.00	6.89E−07	5.34E−07	4.90E−07	3.37E−07	9.91E−08	1.49E−08	2.19E−09
60.00	6.12E−07	5.06E−07	4.70E−07	3.35E−07	1.08E−07	1.85E−08	3.09E−09
65.00	5.55E−07	4.76E−07	4.46E−07	3.27E−07	1.14E−07	2.22E−08	4.25E−09
70.00	5.19E−07	4.60E−07	4.34E−07	3.26E−07	1.22E−07	2.68E−08	5.76E−09
75.00	4.98E−07	4.47E−07	4.23E−07	3.24E−07	1.31E−07	3.25E−08	8.02E−09
80.00	4.81E−07	4.40E−07	4.18E−07	3.25E−07	1.39E−07	3.78E−08	1.02E−08
85.00	4.69E−07	4.35E−07	4.14E−07	3.28E−07	1.48E−07	4.41E−08	1.31E−08
90.00	4.74E−07	4.42E−07	4.22E−07	3.39E−07	1.61E−07	5.21E−08	1.69E−08
95.00	4.82E−07	4.53E−07	4.34E−07	3.52E−07	1.75E−07	6.05E−08	2.11E−08
105.00	5.17E−07	4.90E−07	4.71E−07	3.90E−07	2.09E−07	8.21E−08	3.25E−08
120.00	6.13E−07	5.86E−07	5.66E−07	4.80E−07	2.80E−07	1.26E−07	5.70E−08
135.00	7.37E−07	7.10E−07	6.88E−07	5.94E−07	3.67E−07	1.80E−07	8.94E−08
150.00	8.58E−07	8.28E−07	8.05E−07	7.03E−07	4.52E−07	2.36E−07	1.25E−07
165.00	9.46E−07	9.15E−07	8.91E−07	7.83E−07	5.16E−07	2.79E−07	1.53E−07
180.00	9.78E−07	9.47E−07	9.22E−07	8.12E−07	5.39E−07	2.96E−07	1.64E−07
total	1.04E−02	6.87E−03	6.35E−03	5.23E−03	4.03E−03	3.47E−03	3.44E−03
rel ff	1.06E−02	6.93E−03	6.38E−03	5.20E−03	3.95E−03	3.25E−03	2.87E−03
nrl ff	1.06E−02	6.93E−03	6.38E−03	5.20E−03	3.95E−03	3.24E−03	2.86E−03

TABLE 1. Predicted *S*-matrix differential elastic scattering cross sections for photon energies (50.0, 59.54, 145.4, 316.5, 411.8, 468.1, 661.6, 778.9, 964.0, 1004.8, 1112.1, 1274.5, 1408.0 and 1500.0). The angle integrated total cross sections for each element and energies are presented. ''total'' represents total cross sections from this work, ''rel ff'' represents total cross sections calculated from the relativistic form factor and ''nrl ff'' represents total cross sections calculated from the nonrelativistic form factor—Continued[a]

θ (deg)	Photon energy (keV)						
	50.0	59.5	145.4	316.5	411.8	468.1	661.6
Silicon ($Z=14$)							
0.00	1.56E+01	1.56E+01	1.55E+01	1.55E+01	1.55E+01	1.55E+01	1.55E+01
0.01	1.56E+01	1.56E+01	1.55E+01	1.55E+01	1.55E+01	1.55E+01	1.55E+01
0.02	1.56E+01	1.56E+01	1.55E+01	1.55E+01	1.55E+01	1.55E+01	1.55E+01
0.04	1.56E+01	1.56E+01	1.55E+01	1.55E+01	1.54E+01	1.54E+01	1.53E+01
0.06	1.56E+01	1.56E+01	1.55E+01	1.54E+01	1.53E+01	1.52E+01	1.50E+01
0.10	1.55E+01	1.55E+01	1.55E+01	1.52E+01	1.49E+01	1.48E+01	1.41E+01
0.20	1.55E+01	1.55E+01	1.52E+01	1.42E+01	1.35E+01	1.30E+01	1.15E+01
0.30	1.55E+01	1.54E+01	1.49E+01	1.30E+01	1.19E+01	1.13E+01	9.47E+00
0.40	1.54E+01	1.54E+01	1.44E+01	1.18E+01	1.04E+01	9.79E+00	7.97E+00
0.50	1.54E+01	1.52E+01	1.38E+01	1.07E+01	9.28E+00	8.61E+00	6.80E+00
0.60	1.53E+01	1.51E+01	1.33E+01	9.71E+00	8.33E+00	7.65E+00	5.83E+00
0.70	1.52E+01	1.49E+01	1.27E+01	8.90E+00	7.52E+00	6.84E+00	5.00E+00
0.80	1.51E+01	1.48E+01	1.21E+01	8.19E+00	6.82E+00	6.13E+00	4.29E+00
1.00	1.48E+01	1.44E+01	1.11E+01	7.02E+00	5.63E+00	4.94E+00	3.14E+00
1.20	1.45E+01	1.39E+01	1.01E+01	6.05E+00	4.65E+00	3.97E+00	2.30E+00
1.50	1.39E+01	1.32E+01	8.96E+00	4.85E+00	3.48E+00	2.85E+00	1.46E+00
1.70	1.34E+01	1.27E+01	8.31E+00	4.19E+00	2.86E+00	2.29E+00	1.09E+00
2.00	1.28E+01	1.20E+01	7.46E+00	3.35E+00	2.14E+00	1.66E+00	7.25E−01
2.50	1.17E+01	1.10E+01	6.28E+00	2.31E+00	1.34E+00	9.94E−01	4.08E−01
3.00	1.08E+01	1.00E+01	5.30E+00	1.60E+00	8.63E−01	6.28E−01	2.63E−01
3.50	9.99E+00	9.22E+00	4.47E+00	1.13E+00	5.80E−01	4.21E−01	1.88E−01
4.00	9.30E+00	8.51E+00	3.76E+00	8.16E−01	4.12E−01	3.01E−01	1.44E−01
5.00	8.21E+00	7.34E+00	2.67E+00	4.60E−01	2.42E−01	1.81E−01	9.29E−02
6.00	7.32E+00	6.37E+00	1.90E+00	2.91E−01	1.64E−01	1.25E−01	6.36E−02
7.00	6.58E+00	5.54E+00	1.36E+00	2.03E−01	1.21E−01	9.27E−02	4.35E−02
8.00	5.92E+00	4.82E+00	9.90E−01	1.53E−01	9.33E−02	7.04E−02	2.93E−02
9.00	5.32E+00	4.18E+00	7.34E−01	1.21E−01	7.34E−02	5.40E−02	1.93E−02
10.00	4.75E+00	3.62E+00	5.58E−01	9.79E−02	5.81E−02	4.14E−02	1.26E−02
12.50	3.50E+00	2.54E+00	3.16E−01	6.13E−02	3.17E−02	2.05E−02	4.39E−03
15.00	2.50E+00	1.78E+00	2.07E−01	3.89E−02	1.65E−02	9.75E−03	1.61E−03
17.50	1.77E+00	1.26E+00	1.49E−01	2.42E−02	8.50E−03	4.63E−03	6.39E−04
20.00	1.25E+00	9.07E−01	1.13E−01	1.47E−02	4.40E−03	2.24E−03	2.75E−04
22.50	8.92E−01	6.65E−01	8.90E−02	8.88E−03	2.33E−03	1.13E−03	1.28E−04
25.00	6.54E−01	4.99E−01	7.11E−02	5.35E−03	1.27E−03	5.92E−04	6.45E−05
27.50	4.94E−01	3.86E−01	5.71E−02	3.25E−03	7.13E−04	3.24E−04	3.48E−05
30.00	3.86E−01	3.06E−01	4.58E−02	2.00E−03	4.14E−04	1.84E−04	2.00E−05
35.00	2.57E−01	2.06E−01	2.90E−02	7.97E−04	1.53E−04	6.71E−05	8.05E−06
40.00	1.87E−01	1.49E−01	1.80E−02	3.42E−04	6.35E−05	2.82E−05	3.96E−06
45.00	1.44E−01	1.12E−01	1.11E−02	1.59E−04	2.95E−05	1.35E−05	2.34E−06
50.00	1.15E−01	8.71E−02	6.80E−03	7.92E−05	1.52E−05	7.27E−06	1.58E−06
55.00	9.46E−02	6.90E−02	4.22E−03	4.24E−05	8.60E−06	4.32E−06	1.18E−06
60.00	7.91E−02	5.56E−02	2.66E−03	2.43E−05	5.30E−06	2.82E−06	9.48E−07
65.00	6.70E−02	4.53E−02	1.72E−03	1.49E−05	3.54E−06	1.99E−06	8.04E−07
70.00	5.74E−02	3.74E−02	1.14E−03	9.71E−06	2.54E−06	1.50E−06	7.12E−07
75.00	4.97E−02	3.12E−02	7.77E−04	6.71E−06	1.94E−06	1.21E−06	6.59E−07
80.00	4.35E−02	2.65E−02	5.49E−04	4.91E−06	1.57E−06	1.02E−06	6.19E−07
85.00	3.86E−02	2.28E−02	4.01E−04	3.80E−06	1.33E−06	8.99E−07	5.94E−07
90.00	3.49E−02	2.00E−02	3.04E−04	3.09E−06	1.18E−06	8.29E−07	5.91E−07
95.00	3.20E−02	1.78E−02	2.39E−04	2.63E−06	1.09E−06	7.89E−07	5.94E−07
105.00	2.81E−02	1.50E−02	1.63E−04	2.12E−06	1.01E−06	7.70E−07	6.28E−07
120.00	2.56E−02	1.30E−02	1.13E−04	1.87E−06	1.05E−06	8.40E−07	7.37E−07
135.00	2.49E−02	1.22E−02	9.09E−05	1.86E−06	1.16E−06	9.64E−07	8.82E−07
150.00	2.48E−02	1.18E−02	8.06E−05	1.93E−06	1.29E−06	1.09E−06	1.02E−06
165.00	2.48E−02	1.17E−02	7.58E−05	2.00E−06	1.38E−06	1.19E−06	1.13E−06
180.00	2.49E−02	1.16E−02	7.44E−05	2.03E−06	1.42E−06	1.23E−06	1.16E−06
total	2.40E+00	1.82E+00	3.42E−01	7.50E−02	4.47E−02	3.46E−02	1.74E−02
rel ff	2.51E+00	1.85E+00	3.52E−01	7.70E−02	4.59E−02	3.56E−02	1.78E−02
nrl ff	2.52E+00	1.85E+00	3.52E−01	7.70E−02	4.59E−02	3.56E−02	1.79E−02

TABLE 1. Predicted *S*-matrix differential elastic scattering cross sections for photon energies (50.0, 59.54, 145.4, 316.5, 411.8, 468.1, 661.6, 778.9, 964.0, 1004.8, 1112.1, 1274.5, 1408.0 and 1500.0). The angle integrated total cross sections for each element and energies are presented. ''total'' represents total cross sections from this work, ''rel ff'' represents total cross sections calculated from the relativistic form factor and ''nrl ff'' represents total cross sections calculated from the nonrelativistic form factor—Continued[a]

θ (deg)	photon energy (keV)						
	778.9	964.0	1004.8	1112.1	1274.5	1408.0	1500.0
Silicon ($Z=14$)							
0.00	1.55E+01	1.55E+01	1.55E+01	1.56E+01	1.56E+01	1.57E+01	1.58E+01
0.01	1.55E+01	1.55E+01	1.55E+01	1.55E+01	1.56E+01	1.57E+01	1.57E+01
0.02	1.54E+01	1.54E+01	1.54E+01	1.54E+01	1.54E+01	1.54E+01	1.55E+01
0.04	1.52E+01	1.50E+01	1.50E+01	1.49E+01	1.48E+01	1.47E+01	1.47E+01
0.06	1.48E+01	1.44E+01	1.43E+01	1.41E+01	1.39E+01	1.38E+01	1.37E+01
0.10	1.36E+01	1.29E+01	1.28E+01	1.24E+01	1.20E+01	1.18E+01	1.17E+01
0.20	1.07E+01	9.62E+00	9.41E+00	8.91E+00	8.34E+00	8.03E+00	7.91E+00
0.30	8.62E+00	7.48E+00	7.25E+00	6.66E+00	5.80E+00	5.10E+00	4.62E+00
0.40	7.13E+00	5.95E+00	5.70E+00	5.05E+00	4.05E+00	3.23E+00	2.69E+00
0.50	5.94E+00	4.75E+00	4.50E+00	3.86E+00	2.93E+00	2.22E+00	1.77E+00
0.60	4.96E+00	3.79E+00	3.56E+00	3.00E+00	2.24E+00	1.69E+00	1.36E+00
0.70	4.12E+00	3.03E+00	2.83E+00	2.35E+00	1.77E+00	1.39E+00	1.17E+00
0.80	3.43E+00	2.43E+00	2.25E+00	1.87E+00	1.43E+00	1.18E+00	1.06E+00
1.00	2.37E+00	1.57E+00	1.44E+00	1.19E+00	9.59E−01	8.77E−01	8.73E−01
1.20	1.65E+00	1.03E+00	9.43E−01	7.70E−01	6.38E−01	6.25E−01	6.70E−01
1.50	9.89E−01	5.79E−01	5.25E−01	4.22E−01	3.48E−01	3.46E−01	3.79E−01
1.70	7.23E−01	4.16E−01	3.76E−01	2.99E−01	2.40E−01	2.28E−01	2.39E−01
2.00	4.78E−01	2.78E−01	2.51E−01	1.98E−01	1.49E−01	1.26E−01	1.16E−01
2.50	2.77E−01	1.71E−01	1.56E−01	1.23E−01	8.46E−02	5.85E−02	4.29E−02
3.00	1.84E−01	1.20E−01	1.10E−01	8.76E−02	5.72E−02	3.53E−02	2.28E−02
3.50	1.35E−01	8.95E−02	8.23E−02	6.51E−02	4.17E−02	2.48E−02	1.55E−02
4.00	1.04E−01	6.84E−02	6.27E−02	4.92E−02	3.13E−02	1.88E−02	1.19E−02
5.00	6.53E−02	4.00E−02	3.61E−02	2.76E−02	1.78E−02	1.18E−02	8.48E−03
6.00	4.16E−02	2.24E−02	1.97E−02	1.45E−02	9.70E−03	7.54E−03	6.64E−03
7.00	2.60E−02	1.21E−02	1.04E−02	7.32E−03	5.13E−03	4.70E−03	5.06E−03
8.00	1.59E−02	6.50E−03	5.47E−03	3.74E−03	2.72E−03	2.86E−03	3.63E−03
9.00	9.66E−03	3.55E−03	2.94E−03	1.97E−03	1.49E−03	1.73E−03	2.48E−03
10.00	5.87E−03	1.99E−03	1.63E−03	1.08E−03	8.38E−04	1.06E−03	1.65E−03
12.50	1.77E−03	5.24E−04	4.24E−04	2.77E−04	2.26E−04	3.18E−04	5.50E−04
15.00	5.92E−04	1.63E−04	1.31E−04	8.42E−05	6.85E−05	9.55E−05	1.63E−04
17.50	2.23E−04	5.88E−05	4.69E−05	2.96E−05	2.27E−05	2.85E−05	4.37E−05
20.00	9.37E−05	2.44E−05	1.94E−05	1.19E−05	8.28E−06	8.82E−06	1.13E−05
22.50	4.37E−05	1.16E−05	9.19E−06	5.54E−06	3.42E−06	2.96E−06	3.07E−06
25.00	2.25E−05	6.23E−06	4.96E−06	2.94E−06	1.62E−06	1.13E−06	9.24E−07
27.50	1.26E−05	3.75E−06	3.00E−06	1.78E−06	8.79E−07	4.94E−07	3.20E−07
30.00	7.70E−06	2.49E−06	2.02E−06	1.21E−06	5.46E−07	2.51E−07	1.30E−07
35.00	3.53E−06	1.39E−06	1.16E−06	7.12E−07	2.78E−07	8.98E−08	3.11E−08
40.00	2.01E−06	9.77E−07	8.45E−07	5.45E−07	1.98E−07	4.96E−08	1.28E−08
45.00	1.35E−06	7.95E−07	7.10E−07	4.85E−07	1.75E−07	3.92E−08	8.67E−09
50.00	1.03E−06	6.97E−07	6.38E−07	4.58E−07	1.69E−07	3.63E−08	7.56E−09
55.00	8.40E−07	6.43E−07	6.00E−07	4.52E−07	1.76E−07	3.91E−08	8.27E−09
60.00	7.31E−07	6.08E−07	5.77E−07	4.51E−07	1.88E−07	4.54E−08	1.04E−08
65.00	6.56E−07	5.75E−07	5.50E−07	4.42E−07	1.96E−07	5.17E−08	1.29E−08
70.00	6.09E−07	5.57E−07	5.37E−07	4.41E−07	2.07E−07	5.94E−08	1.62E−08
75.00	5.82E−07	5.43E−07	5.25E−07	4.38E−07	2.18E−07	6.91E−08	2.10E−08
80.00	5.62E−07	5.34E−07	5.19E−07	4.38E−07	2.28E−07	7.78E−08	2.56E−08
85.00	5.50E−07	5.28E−07	5.14E−07	4.39E−07	2.39E−07	8.80E−08	3.15E−08
90.00	5.56E−07	5.38E−07	5.24E−07	4.52E−07	2.55E−07	1.01E−07	3.91E−08
95.00	5.66E−07	5.51E−07	5.38E−07	4.67E−07	2.73E−07	1.15E−07	4.73E−08
105.00	6.09E−07	5.96E−07	5.82E−07	5.13E−07	3.19E−07	1.49E−07	6.90E−08
120.00	7.24E−07	7.11E−07	6.97E−07	6.23E−07	4.14E−07	2.18E−07	1.14E−07
135.00	8.73E−07	8.61E−07	8.45E−07	7.64E−07	5.31E−07	3.01E−07	1.70E−07
150.00	1.02E−06	1.00E−06	9.86E−07	8.98E−07	6.43E−07	3.84E−07	2.29E−07
165.00	1.12E−06	1.11E−06	1.09E−06	9.96E−07	7.27E−07	4.47E−07	2.75E−07
180.00	1.16E−06	1.15E−06	1.13E−06	1.03E−06	7.58E−07	4.71E−07	2.93E−07
total	1.25E−02	8.24E−03	7.61E−03	6.28E−03	4.86E−03	4.10E−03	3.81E−03
rel ff	1.29E−02	8.42E−03	7.75E−03	6.32E−03	4.80E−03	3.95E−03	3.48E−03
nrl ff	1.29E−02	8.43E−03	7.76E−03	6.32E−03	4.80E−03	3.95E−03	3.49E−03

TABLE 1. Predicted *S*-matrix differential elastic scattering cross sections for photon energies (50.0, 59.54, 145.4, 316.5, 411.8, 468.1, 661.6, 778.9, 964.0, 1004.8, 1112.1, 1274.5, 1408.0 and 1500.0). The angle integrated total cross sections for each element and energies are presented. ''total'' represents total cross sections from this work, ''rel ff'' represents total cross sections calculated from the relativistic form factor and ''nrl ff'' represents total cross sections calculated from the nonrelativistic form factor—Continued[a]

θ (deg)	Photon energy (keV)						
	50.0	59.5	145.4	316.5	411.8	468.1	661.6
Phosphorous ($Z=15$)							
0.00	1.79E+01	1.79E+01	1.78E+01	1.78E+01	1.78E+01	1.78E+01	1.78E+01
0.01	1.79E+01	1.79E+01	1.78E+01	1.78E+01	1.78E+01	1.78E+01	1.78E+01
0.02	1.79E+01	1.79E+01	1.78E+01	1.78E+01	1.78E+01	1.78E+01	1.78E+01
0.04	1.79E+01	1.79E+01	1.78E+01	1.78E+01	1.77E+01	1.77E+01	1.75E+01
0.06	1.79E+01	1.79E+01	1.78E+01	1.77E+01	1.76E+01	1.75E+01	1.72E+01
0.10	1.79E+01	1.78E+01	1.77E+01	1.74E+01	1.71E+01	1.69E+01	1.61E+01
0.20	1.78E+01	1.78E+01	1.75E+01	1.63E+01	1.54E+01	1.49E+01	1.32E+01
0.30	1.78E+01	1.77E+01	1.70E+01	1.49E+01	1.36E+01	1.29E+01	1.09E+01
0.40	1.77E+01	1.76E+01	1.65E+01	1.35E+01	1.20E+01	1.12E+01	9.14E+00
0.50	1.76E+01	1.75E+01	1.59E+01	1.22E+01	1.07E+01	9.89E+00	7.73E+00
0.60	1.75E+01	1.73E+01	1.52E+01	1.11E+01	9.56E+00	8.75E+00	6.55E+00
0.70	1.74E+01	1.71E+01	1.45E+01	1.02E+01	8.61E+00	7.78E+00	5.55E+00
0.80	1.73E+01	1.69E+01	1.39E+01	9.39E+00	7.76E+00	6.92E+00	4.72E+00
1.00	1.70E+01	1.65E+01	1.27E+01	7.99E+00	6.31E+00	5.49E+00	3.46E+00
1.20	1.66E+01	1.60E+01	1.16E+01	6.82E+00	5.14E+00	4.37E+00	2.60E+00
1.50	1.59E+01	1.51E+01	1.03E+01	5.39E+00	3.82E+00	3.16E+00	1.75E+00
1.70	1.54E+01	1.46E+01	9.54E+00	4.62E+00	3.17E+00	2.59E+00	1.37E+00
2.00	1.46E+01	1.38E+01	8.53E+00	3.69E+00	2.44E+00	1.94E+00	9.54E−01
2.50	1.34E+01	1.26E+01	7.10E+00	2.61E+00	1.63E+00	1.25E+00	5.49E−01
3.00	1.24E+01	1.15E+01	5.91E+00	1.89E+00	1.12E+00	8.30E−01	3.42E−01
3.50	1.16E+01	1.06E+01	4.93E+00	1.40E+00	7.76E−01	5.66E−01	2.30E−01
4.00	1.09E+01	9.78E+00	4.13E+00	1.05E+00	5.54E−01	4.00E−01	1.66E−01
5.00	9.55E+00	8.39E+00	2.97E+00	6.15E−01	3.10E−01	2.25E−01	1.02E−01
6.00	8.36E+00	7.21E+00	2.20E+00	3.84E−01	1.96E−01	1.45E−01	7.13E−02
7.00	7.31E+00	6.20E+00	1.65E+00	2.57E−01	1.36E−01	1.03E−01	5.11E−02
8.00	6.40E+00	5.34E+00	1.26E+00	1.84E−01	1.03E−01	7.75E−02	3.62E−02
9.00	5.63E+00	4.60E+00	9.64E−01	1.39E−01	8.12E−02	6.06E−02	2.50E−02
10.00	4.97E+00	3.98E+00	7.47E−01	1.10E−01	6.57E−02	4.81E−02	1.70E−02
12.50	3.73E+00	2.83E+00	4.20E−01	6.82E−02	3.87E−02	2.61E−02	6.33E−03
15.00	2.85E+00	2.07E+00	2.60E−01	4.53E−02	2.17E−02	1.34E−02	2.43E−03
17.50	2.17E+00	1.54E+00	1.76E−01	2.99E−02	1.18E−02	6.66E−03	9.93E−04
20.00	1.64E+00	1.16E+00	1.28E−01	1.93E−02	6.33E−03	3.35E−03	4.35E−04
22.50	1.23E+00	8.77E−01	9.82E−02	1.22E−02	3.46E−03	1.73E−03	2.05E−04
25.00	9.23E−01	6.70E−01	7.84E−02	7.59E−03	1.93E−03	9.22E−04	1.03E−04
27.50	6.99E−01	5.20E−01	6.40E−02	4.75E−03	1.10E−03	5.11E−04	5.55E−05
30.00	5.38E−01	4.09E−01	5.25E−02	2.99E−03	6.47E−04	2.93E−04	3.17E−05
35.00	3.38E−01	2.65E−01	3.52E−02	1.23E−03	2.43E−04	1.07E−04	1.24E−05
40.00	2.29E−01	1.82E−01	2.30E−02	5.39E−04	1.02E−04	4.48E−05	5.85E−06
45.00	1.66E−01	1.31E−01	1.47E−02	2.53E−04	4.70E−05	2.12E−05	3.30E−06
50.00	1.27E−01	9.84E−02	9.36E−03	1.27E−04	2.40E−05	1.12E−05	2.13E−06
55.00	1.01E−01	7.66E−02	5.97E−03	6.79E−05	1.33E−05	6.49E−06	1.53E−06
60.00	8.36E−02	6.14E−02	3.85E−03	3.88E−05	8.06E−06	4.12E−06	1.20E−06
65.00	7.09E−02	5.03E−02	2.53E−03	2.36E−05	5.26E−06	2.83E−06	9.94E−07
70.00	6.13E−02	4.19E−02	1.70E−03	1.52E−05	3.69E−06	2.09E−06	8.68E−07
75.00	5.38E−02	3.55E−02	1.18E−03	1.04E−05	2.76E−06	1.64E−06	7.93E−07
80.00	4.79E−02	3.06E−02	8.41E−04	7.52E−06	2.18E−06	1.36E−06	7.41E−07
85.00	4.33E−02	2.68E−02	6.21E−04	5.74E−06	1.82E−06	1.18E−06	7.09E−07
90.00	3.97E−02	2.39E−02	4.74E−04	4.62E−06	1.59E−06	1.07E−06	7.02E−07
95.00	3.71E−02	2.17E−02	3.75E−04	3.88E−06	1.45E−06	1.01E−06	7.05E−07
105.00	3.37E−02	1.88E−02	2.59E−04	3.07E−06	1.32E−06	9.64E−07	7.44E−07
120.00	3.17E−02	1.68E−02	1.80E−04	2.63E−06	1.33E−06	1.03E−06	8.71E−07
135.00	3.16E−02	1.61E−02	1.46E−04	2.56E−06	1.45E−06	1.17E−06	1.04E−06
150.00	3.21E−02	1.59E−02	1.29E−04	2.61E−06	1.59E−06	1.32E−06	1.21E−06
165.00	3.25E−02	1.59E−02	1.21E−04	2.68E−06	1.70E−06	1.43E−06	1.33E−06
180.00	3.26E−02	1.59E−02	1.19E−04	2.70E−06	1.74E−06	1.47E−06	1.37E−06
total	2.83E+00	2.15E+00	4.07E−01	8.94E−02	5.34E−02	4.13E−02	2.08E−02
rel ff	2.98E+00	2.20E+00	4.20E−01	9.22E−02	5.50E−02	4.27E−02	2.14E−02
nrl ff	2.99E+00	2.20E+00	4.21E−01	9.24E−02	5.51E−02	4.27E−02	2.14E−02

TABLE 1. Predicted *S*-matrix differential elastic scattering cross sections for photon energies (50.0, 59.54, 145.4, 316.5, 411.8, 468.1, 661.6, 778.9, 964.0, 1004.8, 1112.1, 1274.5, 1408.0 and 1500.0). The angle integrated total cross sections for each element and energies are presented. ''total'' represents total cross sections from this work, ''rel ff'' represents total cross sections calculated from the relativistic form factor and ''nrl ff'' represents total cross sections calculated from the nonrelativistic form factor—Continued[a]

θ (deg)	Photon energy (keV)						
	778.9	964.0	1004.8	1112.1	1274.5	1408.0	1500.0
Phosphorous ($Z=15$)							
0.00	1.78E+01	1.78E+01	1.78E+01	1.79E+01	1.79E+01	1.80E+01	1.81E+01
0.01	1.78E+01	1.78E+01	1.78E+01	1.78E+01	1.78E+01	1.79E+01	1.80E+01
0.02	1.77E+01	1.77E+01	1.77E+01	1.76E+01	1.76E+01	1.76E+01	1.77E+01
0.04	1.74E+01	1.72E+01	1.72E+01	1.71E+01	1.69E+01	1.68E+01	1.67E+01
0.06	1.69E+01	1.65E+01	1.64E+01	1.62E+01	1.59E+01	1.56E+01	1.55E+01
0.10	1.56E+01	1.48E+01	1.46E+01	1.42E+01	1.37E+01	1.34E+01	1.32E+01
0.20	1.23E+01	1.10E+01	1.08E+01	1.02E+01	9.51E+00	9.07E+00	8.86E+00
0.30	9.90E+00	8.57E+00	8.30E+00	7.61E+00	6.60E+00	5.80E+00	5.25E+00
0.40	8.12E+00	6.71E+00	6.41E+00	5.67E+00	4.59E+00	3.74E+00	3.18E+00
0.50	6.68E+00	5.26E+00	4.98E+00	4.29E+00	3.33E+00	2.63E+00	2.20E+00
0.60	5.50E+00	4.16E+00	3.91E+00	3.32E+00	2.56E+00	2.05E+00	1.75E+00
0.70	4.54E+00	3.34E+00	3.13E+00	2.64E+00	2.07E+00	1.71E+00	1.51E+00
0.80	3.77E+00	2.72E+00	2.54E+00	2.15E+00	1.71E+00	1.47E+00	1.34E+00
1.00	2.67E+00	1.86E+00	1.73E+00	1.46E+00	1.19E+00	1.06E+00	1.01E+00
1.20	1.95E+00	1.31E+00	1.21E+00	1.00E+00	8.10E−01	7.23E−01	6.94E−01
1.50	1.25E+00	7.79E−01	7.10E−01	5.69E−01	4.38E−01	3.83E−01	3.65E−01
1.70	9.48E−01	5.64E−01	5.09E−01	3.98E−01	2.96E−01	2.51E−01	2.35E−01
2.00	6.41E−01	3.65E−01	3.27E−01	2.49E−01	1.77E−01	1.43E−01	1.28E−01
2.50	3.61E−01	2.05E−01	1.84E−01	1.40E−01	9.64E−02	7.26E−02	6.00E−02
3.00	2.26E−01	1.34E−01	1.21E−01	9.42E−02	6.54E−02	4.75E−02	3.72E−02
3.50	1.56E−01	9.72E−02	8.88E−02	7.07E−02	4.92E−02	3.43E−02	2.53E−02
4.00	1.16E−01	7.55E−02	6.95E−02	5.60E−02	3.85E−02	2.54E−02	1.76E−02
5.00	7.28E−02	4.78E−02	4.40E−02	3.49E−02	2.30E−02	1.45E−02	9.55E−03
6.00	4.87E−02	2.88E−02	2.58E−02	1.95E−02	1.27E−02	8.59E−03	6.39E−03
7.00	3.23E−02	1.64E−02	1.43E−02	1.01E−02	6.62E−03	5.15E−03	4.61E−03
8.00	2.09E−02	9.14E−03	7.74E−03	5.24E−03	3.46E−03	3.05E−03	3.22E−03
9.00	1.33E−02	5.13E−03	4.25E−03	2.78E−03	1.86E−03	1.80E−03	2.14E−03
10.00	8.36E−03	2.93E−03	2.40E−03	1.53E−03	1.03E−03	1.07E−03	1.37E−03
12.50	2.68E−03	8.03E−04	6.43E−04	3.96E−04	2.72E−04	3.00E−04	4.15E−04
15.00	9.29E−04	2.55E−04	2.02E−04	1.22E−04	8.18E−05	8.82E−05	1.19E−04
17.50	3.56E−04	9.28E−05	7.28E−05	4.30E−05	2.74E−05	2.71E−05	3.34E−05
20.00	1.51E−04	3.84E−05	3.00E−05	1.74E−05	1.03E−05	8.97E−06	9.64E−06
22.50	7.02E−05	1.80E−05	1.41E−05	8.03E−06	4.39E−06	3.31E−06	3.04E−06
25.00	3.58E−05	9.48E−06	7.44E−06	4.23E−06	2.15E−06	1.40E−06	1.09E−06
27.50	1.98E−05	5.55E−06	4.39E−06	2.52E−06	1.21E−06	6.88E−07	4.60E−07
30.00	1.18E−05	3.57E−06	2.87E−06	1.68E−06	7.79E−07	3.92E−07	2.26E−07
35.00	5.11E−06	1.87E−06	1.55E−06	9.59E−07	4.22E−07	1.71E−07	7.57E−08
40.00	2.75E−06	1.24E−06	1.07E−06	7.14E−07	3.13E−07	1.09E−07	3.89E−08
45.00	1.77E−06	9.77E−07	8.74E−07	6.28E−07	2.83E−07	9.06E−08	2.86E−08
50.00	1.29E−06	8.40E−07	7.74E−07	5.91E−07	2.75E−07	8.41E−08	2.46E−08
55.00	1.03E−06	7.67E−07	7.24E−07	5.83E−07	2.84E−07	8.71E−08	2.50E−08
60.00	8.76E−07	7.23E−07	6.95E−07	5.84E−07	3.01E−07	9.63E−08	2.86E−08
65.00	7.76E−07	6.84E−07	6.65E−07	5.73E−07	3.09E−07	1.05E−07	3.28E−08
70.00	7.15E−07	6.62E−07	6.49E−07	5.71E−07	3.22E−07	1.16E−07	3.87E−08
75.00	6.80E−07	6.47E−07	6.37E−07	5.68E−07	3.34E−07	1.30E−07	4.71E−08
80.00	6.55E−07	6.37E−07	6.28E−07	5.66E−07	3.45E−07	1.43E−07	5.53E−08
85.00	6.41E−07	6.30E−07	6.23E−07	5.66E−07	3.57E−07	1.57E−07	6.56E−08
90.00	6.47E−07	6.42E−07	6.35E−07	5.80E−07	3.78E−07	1.77E−07	7.89E−08
95.00	6.60E−07	6.58E−07	6.51E−07	5.98E−07	4.00E−07	1.97E−07	9.30E−08
105.00	7.10E−07	7.11E−07	7.04E−07	6.52E−07	4.58E−07	2.48E−07	1.29E−07
120.00	8.46E−07	8.48E−07	8.40E−07	7.85E−07	5.80E−07	3.47E−07	2.02E−07
135.00	1.02E−06	1.02E−06	1.02E−06	9.55E−07	7.29E−07	4.64E−07	2.90E−07
150.00	1.19E−06	1.19E−06	1.18E−06	1.12E−06	8.73E−07	5.80E−07	3.80E−07
165.00	1.31E−06	1.32E−06	1.30E−06	1.23E−06	9.78E−07	6.67E−07	4.50E−07
180.00	1.36E−06	1.36E−06	1.35E−06	1.28E−06	1.02E−06	7.00E−07	4.76E−07
total	1.49E−02	9.83E−03	9.08E−03	7.49E−03	5.79E−03	4.82E−03	4.33E−03
rel ff	1.55E−02	1.01E−02	9.30E−03	7.58E−03	5.76E−03	4.73E−03	4.18E−03
nrl ff	1.55E−02	1.01E−02	9.31E−03	7.59E−03	5.77E−03	4.74E−03	4.18E−03

TABLE 1. Predicted *S*-matrix differential elastic scattering cross sections for photon energies (50.0, 59.54, 145.4, 316.5, 411.8, 468.1, 661.6, 778.9, 964.0, 1004.8, 1112.1, 1274.5, 1408.0 and 1500.0). The angle integrated total cross sections for each element and energies are presented. ''total'' represents total cross sections from this work, ''rel ff'' represents total cross sections calculated from the relativistic form factor and ''nrl ff'' represents total cross sections calculated from the nonrelativistic form factor—Continued[a]

θ (deg)	Photon energy (keV)						
	50.0	59.5	145.4	316.5	411.8	468.1	661.6
Sulphur ($Z=16$)							
0.00	2.03E+01	2.03E+01	2.03E+01	2.03E+01	2.03E+01	2.03E+01	2.03E+01
0.01	2.03E+01	2.03E+01	2.03E+01	2.03E+01	2.03E+01	2.03E+01	2.03E+01
0.02	2.03E+01	2.03E+01	2.03E+01	2.03E+01	2.03E+01	2.02E+01	2.02E+01
0.04	2.03E+01	2.03E+01	2.03E+01	2.02E+01	2.01E+01	2.01E+01	1.99E+01
0.06	2.03E+01	2.03E+01	2.03E+01	2.01E+01	2.00E+01	1.99E+01	1.95E+01
0.10	2.03E+01	2.03E+01	2.02E+01	1.98E+01	1.95E+01	1.93E+01	1.84E+01
0.20	2.03E+01	2.03E+01	1.99E+01	1.85E+01	1.75E+01	1.70E+01	1.51E+01
0.30	2.02E+01	2.02E+01	1.94E+01	1.69E+01	1.55E+01	1.47E+01	1.24E+01
0.40	2.01E+01	2.00E+01	1.88E+01	1.53E+01	1.37E+01	1.28E+01	1.04E+01
0.50	2.00E+01	1.99E+01	1.80E+01	1.40E+01	1.22E+01	1.13E+01	8.77E+00
0.60	1.99E+01	1.97E+01	1.73E+01	1.27E+01	1.09E+01	9.98E+00	7.36E+00
0.70	1.98E+01	1.95E+01	1.65E+01	1.17E+01	9.81E+00	8.83E+00	6.18E+00
0.80	1.97E+01	1.93E+01	1.58E+01	1.07E+01	8.80E+00	7.81E+00	5.22E+00
1.00	1.93E+01	1.87E+01	1.45E+01	9.08E+00	7.08E+00	6.12E+00	3.83E+00
1.20	1.88E+01	1.81E+01	1.33E+01	7.69E+00	5.71E+00	4.84E+00	2.93E+00
1.50	1.80E+01	1.72E+01	1.18E+01	6.01E+00	4.22E+00	3.52E+00	2.08E+00
1.70	1.74E+01	1.66E+01	1.09E+01	5.12E+00	3.53E+00	2.92E+00	1.67E+00
2.00	1.66E+01	1.57E+01	9.72E+00	4.10E+00	2.78E+00	2.26E+00	1.21E+00
2.50	1.53E+01	1.43E+01	8.02E+00	2.95E+00	1.95E+00	1.54E+00	7.11E−01
3.00	1.43E+01	1.32E+01	6.61E+00	2.21E+00	1.40E+00	1.06E+00	4.32E−01
3.50	1.34E+01	1.21E+01	5.47E+00	1.69E+00	9.99E−01	7.32E−01	2.79E−01
4.00	1.26E+01	1.12E+01	4.57E+00	1.31E+00	7.17E−01	5.13E−01	1.93E−01
5.00	1.10E+01	9.56E+00	3.32E+00	7.92E−01	3.88E−01	2.74E−01	1.14E−01
6.00	9.51E+00	8.16E+00	2.52E+00	4.91E−01	2.32E−01	1.67E−01	8.01E−02
7.00	8.16E+00	6.96E+00	1.97E+00	3.19E−01	1.55E−01	1.15E−01	5.94E−02
8.00	6.99E+00	5.94E+00	1.55E+00	2.20E−01	1.14E−01	8.61E−02	4.37E−02
9.00	6.05E+00	5.10E+00	1.22E+00	1.61E−01	9.05E−02	6.83E−02	3.13E−02
10.00	5.30E+00	4.40E+00	9.62E−01	1.24E−01	7.43E−02	5.54E−02	2.20E−02
12.50	4.02E+00	3.17E+00	5.39E−01	7.63E−02	4.64E−02	3.24E−02	8.73E−03
15.00	3.22E+00	2.39E+00	3.21E−01	5.24E−02	2.75E−02	1.76E−02	3.50E−03
17.50	2.61E+00	1.85E+00	2.07E−01	3.63E−02	1.56E−02	9.16E−03	1.47E−03
20.00	2.08E+00	1.44E+00	1.45E−01	2.44E−02	8.72E−03	4.76E−03	6.58E−04
22.50	1.62E+00	1.12E+00	1.10E−01	1.60E−02	4.90E−03	2.52E−03	3.13E−04
25.00	1.24E+00	8.65E−01	8.74E−02	1.03E−02	2.79E−03	1.37E−03	1.59E−04
27.50	9.42E−01	6.74E−01	7.20E−02	6.62E−03	1.63E−03	7.70E−04	8.53E−05
30.00	7.19E−01	5.27E−01	6.01E−02	4.26E−03	9.69E−04	4.46E−04	4.85E−05
35.00	4.34E−01	3.33E−01	4.18E−02	1.81E−03	3.70E−04	1.65E−04	1.85E−05
40.00	2.79E−01	2.20E−01	2.84E−02	8.10E−04	1.56E−04	6.88E−05	8.46E−06
45.00	1.92E−01	1.53E−01	1.89E−02	3.85E−04	7.21E−05	3.22E−05	4.59E−06
50.00	1.42E−01	1.12E−01	1.24E−02	1.95E−04	3.65E−05	1.67E−05	2.86E−06
55.00	1.11E−01	8.61E−02	8.09E−03	1.04E−04	2.01E−05	9.53E−06	1.99E−06
60.00	9.04E−02	6.85E−02	5.34E−03	5.95E−05	1.19E−05	5.92E−06	1.51E−06
65.00	7.65E−02	5.63E−02	3.57E−03	3.60E−05	7.66E−06	3.98E−06	1.23E−06
70.00	6.64E−02	4.73E−02	2.44E−03	2.31E−05	5.27E−06	2.88E−06	1.06E−06
75.00	5.88E−02	4.05E−02	1.71E−03	1.57E−05	3.87E−06	2.21E−06	9.54E−07
80.00	5.29E−02	3.53E−02	1.23E−03	1.12E−05	3.01E−06	1.80E−06	8.85E−07
85.00	4.84E−02	3.13E−02	9.18E−04	8.48E−06	2.47E−06	1.54E−06	8.43E−07
90.00	4.50E−02	2.83E−02	7.07E−04	6.76E−06	2.13E−06	1.38E−06	8.30E−07
95.00	4.25E−02	2.60E−02	5.63E−04	5.62E−06	1.91E−06	1.28E−06	8.32E−07
105.00	3.95E−02	2.30E−02	3.92E−04	4.36E−06	1.70E−06	1.21E−06	8.76E−07
120.00	3.84E−02	2.11E−02	2.75E−04	3.65E−06	1.68E−06	1.26E−06	1.02E−06
135.00	3.91E−02	2.07E−02	2.23E−04	3.48E−06	1.80E−06	1.42E−06	1.22E−06
150.00	4.02E−02	2.07E−02	1.99E−04	3.50E−06	1.96E−06	1.58E−06	1.41E−06
165.00	4.10E−02	2.08E−02	1.87E−04	3.56E−06	2.09E−06	1.71E−06	1.55E−06
180.00	4.13E−02	2.08E−02	1.83E−04	3.58E−06	2.13E−06	1.76E−06	1.60E−06
total	3.33E+00	2.53E+00	4.81E−01	1.06E−01	6.33E−02	4.90E−02	2.47E−02
rel ff	3.49E+00	2.58E+00	4.97E−01	1.09E−01	6.52E−02	5.06E−02	2.54E−02
nrl ff	3.50E+00	2.59E+00	4.98E−01	1.10E−01	6.53E−02	5.07E−02	2.54E−02

TABLE 1. Predicted *S*-matrix differential elastic scattering cross sections for photon energies (50.0, 59.54, 145.4, 316.5, 411.8, 468.1, 661.6, 778.9, 964.0, 1004.8, 1112.1, 1274.5, 1408.0 and 1500.0). The angle integrated total cross sections for each element and energies are presented. ''total'' represents total cross sections from this work, ''rel ff'' represents total cross sections calculated from the relativistic form factor and ''nrl ff'' represents total cross sections calculated from the nonrelativistic form factor—Continued[a]

θ (deg)	Photon energy (keV)						
	778.9	964.0	1004.8	1112.1	1274.5	1408.0	1500.0
Sulphur ($Z=16$)							
0.00	2.03E+01	2.03E+01	2.03E+01	2.03E+01	2.03E+01	2.04E+01	2.05E+01
0.01	2.03E+01	2.02E+01	2.02E+01	2.02E+01	2.03E+01	2.03E+01	2.03E+01
0.02	2.02E+01	2.01E+01	2.01E+01	2.01E+01	2.00E+01	2.00E+01	2.00E+01
0.04	1.98E+01	1.96E+01	1.95E+01	1.94E+01	1.92E+01	1.90E+01	1.89E+01
0.06	1.93E+01	1.88E+01	1.87E+01	1.84E+01	1.80E+01	1.77E+01	1.75E+01
0.10	1.78E+01	1.68E+01	1.66E+01	1.61E+01	1.55E+01	1.51E+01	1.49E+01
0.20	1.40E+01	1.26E+01	1.23E+01	1.17E+01	1.08E+01	1.02E+01	9.93E+00
0.30	1.13E+01	9.77E+00	9.46E+00	8.66E+00	7.51E+00	6.58E+00	5.96E+00
0.40	9.23E+00	7.56E+00	7.23E+00	6.38E+00	5.20E+00	4.31E+00	3.74E+00
0.50	7.51E+00	5.86E+00	5.54E+00	4.77E+00	3.78E+00	3.10E+00	2.68E+00
0.60	6.12E+00	4.60E+00	4.33E+00	3.69E+00	2.93E+00	2.45E+00	2.19E+00
0.70	5.02E+00	3.70E+00	3.47E+00	2.96E+00	2.39E+00	2.07E+00	1.90E+00
0.80	4.18E+00	3.05E+00	2.86E+00	2.45E+00	2.01E+00	1.77E+00	1.65E+00
1.00	3.01E+00	2.18E+00	2.05E+00	1.76E+00	1.44E+00	1.25E+00	1.15E+00
1.20	2.27E+00	1.61E+00	1.50E+00	1.26E+00	9.98E−01	8.30E−01	7.32E−01
1.50	1.54E+00	1.01E+00	9.21E−01	7.37E−01	5.40E−01	4.26E−01	3.65E−01
1.70	1.20E+00	7.34E−01	6.62E−01	5.12E−01	3.60E−01	2.79E−01	2.39E−01
2.00	8.26E−01	4.67E−01	4.15E−01	3.09E−01	2.10E−01	1.63E−01	1.42E−01
2.50	4.58E−01	2.45E−01	2.17E−01	1.60E−01	1.11E−01	8.87E−02	8.02E−02
3.00	2.74E−01	1.51E−01	1.35E−01	1.03E−01	7.49E−02	6.17E−02	5.58E−02
3.50	1.81E−01	1.07E−01	9.74E−02	7.77E−02	5.76E−02	4.54E−02	3.82E−02
4.00	1.30E−01	8.39E−02	7.75E−02	6.36E−02	4.63E−02	3.31E−02	2.45E−02
5.00	8.16E−02	5.63E−02	5.24E−02	4.29E−02	2.88E−02	1.75E−02	1.09E−02
6.00	5.66E−02	3.59E−02	3.27E−02	2.53E−02	1.60E−02	9.85E−03	6.47E−03
7.00	3.93E−02	2.14E−02	1.88E−02	1.35E−02	8.36E−03	5.72E−03	4.43E−03
8.00	2.66E−02	1.23E−02	1.05E−02	7.08E−03	4.34E−03	3.32E−03	3.02E−03
9.00	1.75E−02	7.10E−03	5.90E−03	3.79E−03	2.32E−03	1.92E−03	1.96E−03
10.00	1.14E−02	4.15E−03	3.39E−03	2.10E−03	1.28E−03	1.12E−03	1.22E−03
12.50	3.86E−03	1.18E−03	9.40E−04	5.55E−04	3.31E−04	3.00E−04	3.44E−04
15.00	1.39E−03	3.83E−04	3.00E−04	1.72E−04	9.94E−05	8.71E−05	9.68E−05
17.50	5.44E−04	1.41E−04	1.09E−04	6.14E−05	3.37E−05	2.75E−05	2.83E−05
20.00	2.33E−04	5.85E−05	4.51E−05	2.49E−05	1.29E−05	9.59E−06	8.93E−06
22.50	1.08E−04	2.72E−05	2.10E−05	1.15E−05	5.67E−06	3.81E−06	3.18E−06
25.00	5.49E−05	1.41E−05	1.09E−05	5.99E−06	2.86E−06	1.76E−06	1.32E−06
27.50	3.00E−05	8.05E−06	6.30E−06	3.52E−06	1.65E−06	9.43E−07	6.44E−07
30.00	1.75E−05	5.05E−06	4.01E−06	2.31E−06	1.09E−06	5.86E−07	3.68E−07
35.00	7.29E−06	2.50E−06	2.06E−06	1.27E−06	6.14E−07	2.98E−07	1.60E−07
40.00	3.75E−06	1.58E−06	1.36E−06	9.22E−07	4.66E−07	2.09E−07	9.82E−08
45.00	2.31E−06	1.20E−06	1.07E−06	7.96E−07	4.27E−07	1.82E−07	7.69E−08
50.00	1.62E−06	1.01E−06	9.31E−07	7.42E−07	4.15E−07	1.69E−07	6.57E−08
55.00	1.26E−06	9.08E−07	8.64E−07	7.30E−07	4.26E−07	1.70E−07	6.30E−08
60.00	1.05E−06	8.50E−07	8.25E−07	7.29E−07	4.45E−07	1.81E−07	6.69E−08
65.00	9.18E−07	8.02E−07	7.88E−07	7.17E−07	4.53E−07	1.89E−07	7.19E−08
70.00	8.38E−07	7.75E−07	7.69E−07	7.13E−07	4.66E−07	2.03E−07	8.04E−08
75.00	7.91E−07	7.59E−07	7.56E−07	7.10E−07	4.80E−07	2.21E−07	9.31E−08
80.00	7.60E−07	7.47E−07	7.46E−07	7.07E−07	4.90E−07	2.37E−07	1.06E−07
85.00	7.43E−07	7.39E−07	7.39E−07	7.05E−07	5.02E−07	2.57E−07	1.22E−07
90.00	7.49E−07	7.53E−07	7.54E−07	7.22E−07	5.27E−07	2.83E−07	1.42E−07
95.00	7.63E−07	7.72E−07	7.73E−07	7.42E−07	5.54E−07	3.11E−07	1.64E−07
105.00	8.22E−07	8.35E−07	8.36E−07	8.06E−07	6.24E−07	3.79E−07	2.19E−07
120.00	9.80E−07	9.95E−07	9.95E−07	9.62E−07	7.75E−07	5.14E−07	3.28E−07
135.00	1.18E−06	1.20E−06	1.20E−06	1.16E−06	9.60E−07	6.70E−07	4.54E−07
150.00	1.38E−06	1.40E−06	1.39E−06	1.35E−06	1.14E−06	8.23E−07	5.81E−07
165.00	1.52E−06	1.54E−06	1.54E−06	1.49E−06	1.27E−06	9.37E−07	6.78E−07
180.00	1.57E−06	1.59E−06	1.59E−06	1.54E−06	1.31E−06	9.79E−07	7.14E−07
total	1.77E−02	1.17E−02	1.08E−02	8.88E−03	6.84E−03	5.63E−03	4.99E−03
rel ff	1.83E−02	1.20E−02	1.10E−02	8.99E−03	6.83E−03	5.61E−03	4.96E−03
nrl ff	1.84E−02	1.20E−02	1.11E−02	9.01E−03	6.85E−03	5.63E−03	4.97E−03

TABLE 1. Predicted *S*-matrix differential elastic scattering cross sections for photon energies (50.0, 59.54, 145.4, 316.5, 411.8, 468.1, 661.6, 778.9, 964.0, 1004.8, 1112.1, 1274.5, 1408.0 and 1500.0). The angle integrated total cross sections for each element and energies are presented. ''total'' represents total cross sections from this work, ''rel ff'' represents total cross sections calculated from the relativistic form factor and ''nrl ff'' represents total cross sections calculated from the nonrelativistic form factor—Continued[a]

θ (deg)	Photon energy (keV)						
	50.0	59.5	145.4	316.5	411.8	468.1	661.6
Chlorine ($Z=17$)							
0.00	2.30E+01	2.30E+01	2.29E+01	2.29E+01	2.29E+01	2.29E+01	2.29E+01
0.01	2.30E+01	2.30E+01	2.29E+01	2.29E+01	2.29E+01	2.29E+01	2.29E+01
0.02	2.30E+01	2.30E+01	2.29E+01	2.29E+01	2.29E+01	2.29E+01	2.28E+01
0.04	2.30E+01	2.29E+01	2.29E+01	2.28E+01	2.27E+01	2.27E+01	2.25E+01
0.06	2.30E+01	2.29E+01	2.29E+01	2.27E+01	2.25E+01	2.24E+01	2.20E+01
0.10	2.29E+01	2.29E+01	2.28E+01	2.23E+01	2.20E+01	2.17E+01	2.08E+01
0.20	2.29E+01	2.29E+01	2.24E+01	2.09E+01	1.98E+01	1.92E+01	1.71E+01
0.30	2.28E+01	2.28E+01	2.19E+01	1.91E+01	1.75E+01	1.67E+01	1.41E+01
0.40	2.27E+01	2.26E+01	2.12E+01	1.74E+01	1.55E+01	1.46E+01	1.19E+01
0.50	2.26E+01	2.25E+01	2.04E+01	1.58E+01	1.39E+01	1.28E+01	9.93E+00
0.60	2.25E+01	2.23E+01	1.95E+01	1.45E+01	1.24E+01	1.13E+01	8.28E+00
0.70	2.24E+01	2.20E+01	1.87E+01	1.33E+01	1.11E+01	1.00E+01	6.91E+00
0.80	2.22E+01	2.18E+01	1.79E+01	1.22E+01	9.97E+00	8.81E+00	5.80E+00
1.00	2.18E+01	2.12E+01	1.64E+01	1.03E+01	7.95E+00	6.85E+00	4.26E+00
1.20	2.13E+01	2.05E+01	1.51E+01	8.67E+00	6.36E+00	5.39E+00	3.31E+00
1.50	2.03E+01	1.95E+01	1.34E+01	6.71E+00	4.69E+00	3.94E+00	2.42E+00
1.70	1.97E+01	1.88E+01	1.24E+01	5.71E+00	3.94E+00	3.29E+00	2.00E+00
2.00	1.87E+01	1.78E+01	1.10E+01	4.56E+00	3.14E+00	2.60E+00	1.49E+00
2.50	1.74E+01	1.63E+01	9.05E+00	3.32E+00	2.29E+00	1.84E+00	8.91E−01
3.00	1.63E+01	1.50E+01	7.41E+00	2.55E+00	1.70E+00	1.31E+00	5.33E−01
3.50	1.53E+01	1.38E+01	6.09E+00	2.01E+00	1.24E+00	9.15E−01	3.34E−01
4.00	1.44E+01	1.27E+01	5.08E+00	1.59E+00	8.99E−01	6.40E−01	2.25E−01
5.00	1.27E+01	1.09E+01	3.71E+00	9.89E−01	4.77E−01	3.31E−01	1.28E−01
6.00	1.08E+01	9.22E+00	2.88E+00	6.11E−01	2.74E−01	1.94E−01	9.03E−02
7.00	9.13E+00	7.82E+00	2.31E+00	3.89E−01	1.77E−01	1.30E−01	6.85E−02
8.00	7.71E+00	6.64E+00	1.87E+00	2.61E−01	1.29E−01	9.65E−02	5.18E−02
9.00	6.59E+00	5.67E+00	1.50E+00	1.87E−01	1.02E−01	7.70E−02	3.82E−02
10.00	5.73E+00	4.89E+00	1.20E+00	1.41E−01	8.41E−02	6.36E−02	2.76E−02
12.50	4.39E+00	3.56E+00	6.74E−01	8.59E−02	5.46E−02	3.92E−02	1.16E−02
15.00	3.63E+00	2.74E+00	3.90E−01	6.03E−02	3.39E−02	2.23E−02	4.85E−03
17.50	3.07E+00	2.18E+00	2.43E−01	4.31E−02	2.00E−02	1.21E−02	2.10E−03
20.00	2.54E+00	1.74E+00	1.66E−01	3.01E−02	1.16E−02	6.51E−03	9.58E−04
22.50	2.04E+00	1.38E+00	1.23E−01	2.04E−02	6.67E−03	3.53E−03	4.62E−04
25.00	1.59E+00	1.08E+00	9.81E−02	1.35E−02	3.89E−03	1.96E−03	2.36E−04
27.50	1.22E+00	8.46E−01	8.12E−02	8.88E−03	2.31E−03	1.12E−03	1.27E−04
30.00	9.26E−01	6.61E−01	6.85E−02	5.83E−03	1.39E−03	6.55E−04	7.21E−05
35.00	5.44E−01	4.09E−01	4.91E−02	2.56E−03	5.44E−04	2.45E−04	2.70E−05
40.00	3.37E−01	2.64E−01	3.44E−02	1.17E−03	2.31E−04	1.02E−04	1.20E−05
45.00	2.24E−01	1.79E−01	2.35E−02	5.65E−04	1.07E−04	4.76E−05	6.32E−06
50.00	1.61E−01	1.29E−01	1.58E−02	2.88E−04	5.41E−05	2.44E−05	3.81E−06
55.00	1.23E−01	9.76E−02	1.06E−02	1.55E−04	2.94E−05	1.37E−05	2.57E−06
60.00	9.94E−02	7.73E−02	7.12E−03	8.86E−05	1.73E−05	8.37E−06	1.91E−06
65.00	8.38E−02	6.34E−02	4.84E−03	5.34E−05	1.09E−05	5.53E−06	1.52E−06
70.00	7.28E−02	5.35E−02	3.36E−03	3.41E−05	7.41E−06	3.92E−06	1.29E−06
75.00	6.47E−02	4.61E−02	2.38E−03	2.30E−05	5.35E−06	2.96E−06	1.15E−06
80.00	5.87E−02	4.05E−02	1.74E−03	1.63E−05	4.10E−06	2.37E−06	1.05E−06
85.00	5.41E−02	3.62E−02	1.31E−03	1.23E−05	3.32E−06	2.00E−06	1.00E−06
90.00	5.07E−02	3.30E−02	1.01E−03	9.69E−06	2.83E−06	1.77E−06	9.79E−07
95.00	4.83E−02	3.06E−02	8.13E−04	8.01E−06	2.52E−06	1.63E−06	9.78E−07
105.00	4.57E−02	2.76E−02	5.72E−04	6.11E−06	2.20E−06	1.51E−06	1.03E−06
120.00	4.53E−02	2.59E−02	4.05E−04	5.00E−06	2.12E−06	1.55E−06	1.19E−06
135.00	4.70E−02	2.58E−02	3.31E−04	4.69E−06	2.25E−06	1.71E−06	1.41E−06
150.00	4.89E−02	2.61E−02	2.95E−04	4.66E−06	2.42E−06	1.90E−06	1.63E−06
165.00	5.02E−02	2.64E−02	2.78E−04	4.70E−06	2.56E−06	2.04E−06	1.79E−06
180.00	5.07E−02	2.65E−02	2.73E−04	4.72E−06	2.61E−06	2.10E−06	1.85E−06
total	3.88E+00	2.96E+00	5.65E−01	1.25E−01	7.45E−02	5.76E−02	2.90E−02
rel ff	4.05E+00	3.00E+00	5.81E−01	1.28E−01	7.65E−02	5.93E−02	2.98E−02
nrl ff	4.07E+00	3.01E+00	5.83E−01	1.29E−01	7.68E−02	5.95E−02	2.99E−02

TABLE 1. Predicted *S*-matrix differential elastic scattering cross sections for photon energies (50.0, 59.54, 145.4, 316.5, 411.8, 468.1, 661.6, 778.9, 964.0, 1004.8, 1112.1, 1274.5, 1408.0 and 1500.0). The angle integrated total cross sections for each element and energies are presented. ''total'' represents total cross sections from this work, ''rel ff'' represents total cross sections calculated from the relativistic form factor and ''nrl ff'' represents total cross sections calculated from the nonrelativistic form factor—Continued[a]

θ (deg)	Photon energy (keV)						
	778.9	964.0	1004.8	1112.1	1274.5	1408.0	1500.0
Chlorine ($Z=17$)							
0.00	2.29E+01	2.29E+01	2.29E+01	2.29E+01	2.29E+01	2.30E+01	2.30E+01
0.01	2.29E+01	2.28E+01	2.28E+01	2.28E+01	2.28E+01	2.29E+01	2.29E+01
0.02	2.28E+01	2.27E+01	2.27E+01	2.26E+01	2.26E+01	2.25E+01	2.25E+01
0.04	2.23E+01	2.21E+01	2.20E+01	2.19E+01	2.16E+01	2.14E+01	2.12E+01
0.06	2.17E+01	2.12E+01	2.11E+01	2.08E+01	2.03E+01	1.99E+01	1.96E+01
0.10	2.01E+01	1.90E+01	1.88E+01	1.82E+01	1.74E+01	1.69E+01	1.67E+01
0.20	1.59E+01	1.43E+01	1.40E+01	1.33E+01	1.22E+01	1.15E+01	1.11E+01
0.30	1.29E+01	1.11E+01	1.07E+01	9.83E+00	8.52E+00	7.47E+00	6.77E+00
0.40	1.05E+01	8.53E+00	8.14E+00	7.19E+00	5.90E+00	4.96E+00	4.37E+00
0.50	8.45E+00	6.54E+00	6.18E+00	5.34E+00	4.29E+00	3.61E+00	3.22E+00
0.60	6.84E+00	5.11E+00	4.81E+00	4.12E+00	3.34E+00	2.89E+00	2.67E+00
0.70	5.59E+00	4.11E+00	3.87E+00	3.33E+00	2.75E+00	2.45E+00	2.32E+00
0.80	4.65E+00	3.42E+00	3.22E+00	2.79E+00	2.34E+00	2.10E+00	1.99E+00
1.00	3.39E+00	2.53E+00	2.39E+00	2.08E+00	1.71E+00	1.46E+00	1.31E+00
1.20	2.62E+00	1.93E+00	1.81E+00	1.54E+00	1.20E+00	9.46E−01	7.83E−01
1.50	1.86E+00	1.25E+00	1.15E+00	9.24E−01	6.52E−01	4.77E−01	3.77E−01
1.70	1.47E+00	9.23E−01	8.34E−01	6.40E−01	4.32E−01	3.13E−01	2.51E−01
2.00	1.03E+00	5.81E−01	5.14E−01	3.77E−01	2.48E−01	1.86E−01	1.59E−01
2.50	5.67E−01	2.91E−01	2.55E−01	1.85E−01	1.28E−01	1.07E−01	1.03E−01
3.00	3.29E−01	1.72E−01	1.52E−01	1.15E−01	8.60E−02	7.75E−02	7.81E−02
3.50	2.10E−01	1.19E−01	1.08E−01	8.62E−02	6.69E−02	5.78E−02	5.36E−02
4.00	1.48E−01	9.38E−02	8.67E−02	7.20E−02	5.47E−02	4.16E−02	3.27E−02
5.00	9.18E−02	6.54E−02	6.14E−02	5.14E−02	3.50E−02	2.10E−02	1.26E−02
6.00	6.52E−02	4.36E−02	4.00E−02	3.15E−02	1.97E−02	1.13E−02	6.82E−03
7.00	4.69E−02	2.69E−02	2.39E−02	1.73E−02	1.04E−02	6.44E−03	4.46E−03
8.00	3.29E−02	1.60E−02	1.37E−02	9.27E−03	5.39E−03	3.68E−03	2.96E−03
9.00	2.24E−02	9.49E−03	7.92E−03	5.05E−03	2.87E−03	2.10E−03	1.88E−03
10.00	1.50E−02	5.67E−03	4.63E−03	2.83E−03	1.58E−03	1.20E−03	1.14E−03
12.50	5.36E−03	1.68E−03	1.33E−03	7.63E−04	4.07E−04	3.14E−04	3.08E−04
15.00	2.00E−03	5.58E−04	4.34E−04	2.40E−04	1.23E−04	9.07E−05	8.61E−05
17.50	7.99E−04	2.08E−04	1.60E−04	8.62E−05	4.21E−05	2.93E−05	2.61E−05
20.00	3.46E−04	8.64E−05	6.61E−05	3.51E−05	1.64E−05	1.07E−05	8.87E−06
22.50	1.62E−04	3.99E−05	3.05E−05	1.61E−05	7.36E−06	4.51E−06	3.47E−06
25.00	8.17E−05	2.04E−05	1.57E−05	8.38E−06	3.79E−06	2.22E−06	1.61E−06
27.50	4.42E−05	1.15E−05	8.91E−06	4.87E−06	2.23E−06	1.27E−06	8.82E−07
30.00	2.55E−05	7.04E−06	5.54E−06	3.14E−06	1.49E−06	8.44E−07	5.67E−07
35.00	1.02E−05	3.31E−06	2.71E−06	1.67E−06	8.61E−07	4.80E−07	3.00E−07
40.00	5.07E−06	2.00E−06	1.71E−06	1.17E−06	6.62E−07	3.63E−07	2.11E−07
45.00	3.01E−06	1.47E−06	1.31E−06	9.91E−07	6.07E−07	3.25E−07	1.74E−07
50.00	2.04E−06	1.20E−06	1.11E−06	9.12E−07	5.88E−07	3.02E−07	1.48E−07
55.00	1.54E−06	1.07E−06	1.02E−06	8.90E−07	5.98E−07	2.96E−07	1.36E−07
60.00	1.26E−06	9.90E−07	9.65E−07	8.85E−07	6.17E−07	3.05E−07	1.36E−07
65.00	1.08E−06	9.31E−07	9.20E−07	8.69E−07	6.23E−07	3.10E−07	1.39E−07
70.00	9.80E−07	8.97E−07	8.96E−07	8.64E−07	6.36E−07	3.25E−07	1.49E−07
75.00	9.19E−07	8.77E−07	8.81E−07	8.62E−07	6.50E−07	3.45E−07	1.65E−07
80.00	8.79E−07	8.63E−07	8.70E−07	8.56E−07	6.60E−07	3.64E−07	1.82E−07
85.00	8.58E−07	8.55E−07	8.63E−07	8.53E−07	6.71E−07	3.87E−07	2.04E−07
90.00	8.62E−07	8.71E−07	8.80E−07	8.73E−07	7.00E−07	4.21E−07	2.33E−07
95.00	8.78E−07	8.94E−07	9.03E−07	8.97E−07	7.31E−07	4.56E−07	2.63E−07
105.00	9.45E−07	9.67E−07	9.75E−07	9.71E−07	8.14E−07	5.44E−07	3.40E−07
120.00	1.12E−06	1.15E−06	1.16E−06	1.15E−06	9.96E−07	7.16E−07	4.90E−07
135.00	1.35E−06	1.39E−06	1.40E−06	1.39E−06	1.22E−06	9.15E−07	6.59E−07
150.00	1.58E−06	1.61E−06	1.62E−06	1.61E−06	1.43E−06	1.11E−06	8.28E−07
165.00	1.74E−06	1.77E−06	1.78E−06	1.77E−06	1.58E−06	1.25E−06	9.54E−07
180.00	1.80E−06	1.83E−06	1.84E−06	1.83E−06	1.64E−06	1.30E−06	1.00E−06
total	2.09E−02	1.37E−02	1.27E−02	1.04E−02	8.00E−03	6.55E−03	5.77E−03
rel ff	2.15E−02	1.41E−02	1.29E−02	1.06E−02	8.02E−03	6.59E−03	5.82E−03
nrl ff	2.16E−02	1.41E−02	1.30E−02	1.06E−02	8.05E−03	6.61E−03	5.84E−03

TABLE 1. Predicted *S*-matrix differential elastic scattering cross sections for photon energies (50.0, 59.54, 145.4, 316.5, 411.8, 468.1, 661.6, 778.9, 964.0, 1004.8, 1112.1, 1274.5, 1408.0 and 1500.0). The angle integrated total cross sections for each element and energies are presented. ''total'' represents total cross sections from this work, ''rel ff'' represents total cross sections calculated from the relativistic form factor and ''nrl ff'' represents total cross sections calculated from the nonrelativistic form factor—Continued[a]

θ (deg)	Photon energy (keV)						
	50.0	59.5	145.4	316.5	411.8	468.1	661.6
Argon ($Z=18$)							
0.00	2.58E+01	2.57E+01	2.57E+01	2.57E+01	2.57E+01	2.57E+01	2.57E+01
0.01	2.58E+01	2.57E+01	2.57E+01	2.57E+01	2.56E+01	2.56E+01	2.56E+01
0.02	2.58E+01	2.57E+01	2.57E+01	2.56E+01	2.56E+01	2.56E+01	2.56E+01
0.04	2.57E+01	2.57E+01	2.57E+01	2.56E+01	2.55E+01	2.54E+01	2.52E+01
0.06	2.57E+01	2.57E+01	2.56E+01	2.54E+01	2.53E+01	2.52E+01	2.47E+01
0.10	2.57E+01	2.57E+01	2.55E+01	2.50E+01	2.47E+01	2.44E+01	2.33E+01
0.20	2.57E+01	2.57E+01	2.51E+01	2.35E+01	2.23E+01	2.16E+01	1.92E+01
0.30	2.56E+01	2.55E+01	2.45E+01	2.15E+01	1.97E+01	1.88E+01	1.60E+01
0.40	2.55E+01	2.54E+01	2.38E+01	1.96E+01	1.75E+01	1.65E+01	1.34E+01
0.50	2.54E+01	2.52E+01	2.29E+01	1.79E+01	1.57E+01	1.46E+01	1.12E+01
0.60	2.53E+01	2.50E+01	2.20E+01	1.64E+01	1.41E+01	1.28E+01	9.31E+00
0.70	2.51E+01	2.47E+01	2.11E+01	1.50E+01	1.26E+01	1.13E+01	7.74E+00
0.80	2.49E+01	2.44E+01	2.02E+01	1.38E+01	1.13E+01	9.93E+00	6.48E+00
1.00	2.45E+01	2.38E+01	1.85E+01	1.16E+01	8.94E+00	7.67E+00	4.75E+00
1.20	2.39E+01	2.31E+01	1.71E+01	9.77E+00	7.11E+00	6.01E+00	3.72E+00
1.50	2.28E+01	2.19E+01	1.52E+01	7.52E+00	5.23E+00	4.40E+00	2.79E+00
1.70	2.21E+01	2.12E+01	1.41E+01	6.37E+00	4.40E+00	3.71E+00	2.35E+00
2.00	2.11E+01	2.01E+01	1.25E+01	5.09E+00	3.55E+00	2.98E+00	1.79E+00
2.50	1.96E+01	1.84E+01	1.02E+01	3.74E+00	2.66E+00	2.17E+00	1.09E+00
3.00	1.84E+01	1.69E+01	8.31E+00	2.92E+00	2.02E+00	1.57E+00	6.46E−01
3.50	1.74E+01	1.56E+01	6.81E+00	2.34E+00	1.50E+00	1.11E+00	3.97E−01
4.00	1.65E+01	1.44E+01	5.66E+00	1.89E+00	1.10E+00	7.79E−01	2.61E−01
5.00	1.44E+01	1.23E+01	4.16E+00	1.20E+00	5.76E−01	3.95E−01	1.45E−01
6.00	1.22E+01	1.04E+01	3.27E+00	7.43E−01	3.22E−01	2.25E−01	1.02E−01
7.00	1.02E+01	8.79E+00	2.67E+00	4.68E−01	2.04E−01	1.47E−01	7.83E−02
8.00	8.56E+00	7.43E+00	2.20E+00	3.09E−01	1.46E−01	1.09E−01	6.04E−02
9.00	7.26E+00	6.33E+00	1.80E+00	2.16E−01	1.15E−01	8.71E−02	4.56E−02
10.00	6.27E+00	5.46E+00	1.45E+00	1.62E−01	9.51E−02	7.25E−02	3.37E−02
12.50	4.82E+00	3.99E+00	8.21E−01	9.70E−02	6.33E−02	4.63E−02	1.49E−02
15.00	4.08E+00	3.13E+00	4.67E−01	6.89E−02	4.07E−02	2.76E−02	6.49E−03
17.50	3.55E+00	2.53E+00	2.84E−01	5.04E−02	2.49E−02	1.55E−02	2.90E−03
20.00	3.03E+00	2.06E+00	1.90E−01	3.61E−02	1.48E−02	8.60E−03	1.35E−03
22.50	2.48E+00	1.65E+00	1.40E−01	2.51E−02	8.80E−03	4.79E−03	6.60E−04
25.00	1.96E+00	1.31E+00	1.11E−01	1.71E−02	5.25E−03	2.71E−03	3.40E−04
27.50	1.52E+00	1.03E+00	9.18E−02	1.15E−02	3.17E−03	1.57E−03	1.84E−04
30.00	1.15E+00	8.07E−01	7.78E−02	7.70E−03	1.94E−03	9.29E−04	1.04E−04
35.00	6.69E−01	4.95E−01	5.68E−02	3.49E−03	7.73E−04	3.53E−04	3.85E−05
40.00	4.05E−01	3.14E−01	4.07E−02	1.64E−03	3.33E−04	1.48E−04	1.68E−05
45.00	2.62E−01	2.09E−01	2.85E−02	8.02E−04	1.55E−04	6.86E−05	8.61E−06
50.00	1.84E−01	1.48E−01	1.96E−02	4.13E−04	7.80E−05	3.49E−05	5.04E−06
55.00	1.39E−01	1.11E−01	1.34E−02	2.24E−04	4.22E−05	1.94E−05	3.31E−06
60.00	1.11E−01	8.77E−02	9.19E−03	1.28E−04	2.46E−05	1.17E−05	2.40E−06
65.00	9.29E−02	7.19E−02	6.35E−03	7.73E−05	1.54E−05	7.57E−06	1.87E−06
70.00	8.06E−02	6.06E−02	4.47E−03	4.92E−05	1.03E−05	5.29E−06	1.56E−06
75.00	7.17E−02	5.24E−02	3.21E−03	3.30E−05	7.33E−06	3.94E−06	1.38E−06
80.00	6.52E−02	4.63E−02	2.37E−03	2.34E−05	5.54E−06	3.11E−06	1.25E−06
85.00	6.03E−02	4.16E−02	1.80E−03	1.74E−05	4.44E−06	2.59E−06	1.18E−06
90.00	5.69E−02	3.82E−02	1.41E−03	1.37E−05	3.74E−06	2.27E−06	1.15E−06
95.00	5.44E−02	3.56E−02	1.14E−03	1.12E−05	3.29E−06	2.06E−06	1.14E−06
105.00	5.21E−02	3.25E−02	8.07E−04	8.46E−06	2.83E−06	1.88E−06	1.19E−06
120.00	5.26E−02	3.11E−02	5.78E−04	6.80E−06	2.68E−06	1.90E−06	1.38E−06
135.00	5.52E−02	3.13E−02	4.76E−04	6.28E−06	2.79E−06	2.07E−06	1.63E−06
150.00	5.81E−02	3.20E−02	4.26E−04	6.17E−06	2.98E−06	2.28E−06	1.87E−06
165.00	6.01E−02	3.26E−02	4.02E−04	6.18E−06	3.13E−06	2.44E−06	2.05E−06
180.00	6.08E−02	3.28E−02	3.94E−04	6.19E−06	3.19E−06	2.50E−06	2.12E−06
total	4.50E+00	3.43E+00	6.57E−01	1.45E−01	8.69E−02	6.72E−02	3.39E−02
rel ff	4.67E+00	3.47E+00	6.74E−01	1.49E−01	8.91E−02	6.91E−02	3.47E−02
nrl ff	4.69E+00	3.48E+00	6.77E−01	1.50E−01	8.94E−02	6.94E−02	3.49E−02

TABLE 1. Predicted *S*-matrix differential elastic scattering cross sections for photon energies (50.0, 59.54, 145.4, 316.5, 411.8, 468.1, 661.6, 778.9, 964.0, 1004.8, 1112.1, 1274.5, 1408.0 and 1500.0). The angle integrated total cross sections for each element and energies are presented. ''total'' represents total cross sections from this work, ''rel ff'' represents total cross sections calculated from the relativistic form factor and ''nrl ff'' represents total cross sections calculated from the nonrelativistic form factor—Continued[a]

θ (deg)	Photon energy (keV)						
	778.9	964.0	1004.8	1112.1	1274.5	1408.0	1500.0
Argon ($Z=18$)							
0.00	2.57E+01	2.57E+01	2.57E+01	2.57E+01	2.57E+01	2.57E+01	2.57E+01
0.01	2.56E+01	2.56E+01	2.56E+01	2.56E+01	2.56E+01	2.56E+01	2.56E+01
0.02	2.55E+01	2.54E+01	2.54E+01	2.54E+01	2.53E+01	2.52E+01	2.52E+01
0.04	2.51E+01	2.48E+01	2.47E+01	2.45E+01	2.42E+01	2.40E+01	2.37E+01
0.06	2.44E+01	2.38E+01	2.37E+01	2.33E+01	2.27E+01	2.22E+01	2.19E+01
0.10	2.26E+01	2.14E+01	2.11E+01	2.05E+01	1.96E+01	1.90E+01	1.87E+01
0.20	1.80E+01	1.62E+01	1.59E+01	1.50E+01	1.38E+01	1.30E+01	1.25E+01
0.30	1.46E+01	1.26E+01	1.22E+01	1.11E+01	9.65E+00	8.47E+00	7.69E+00
0.40	1.18E+01	9.61E+00	9.17E+00	8.10E+00	6.68E+00	5.68E+00	5.07E+00
0.50	9.51E+00	7.32E+00	6.92E+00	5.98E+00	4.87E+00	4.18E+00	3.81E+00
0.60	7.65E+00	5.70E+00	5.36E+00	4.61E+00	3.80E+00	3.37E+00	3.19E+00
0.70	6.24E+00	4.59E+00	4.32E+00	3.73E+00	3.14E+00	2.86E+00	2.76E+00
0.80	5.18E+00	3.84E+00	3.62E+00	3.16E+00	2.68E+00	2.44E+00	2.33E+00
1.00	3.82E+00	2.90E+00	2.75E+00	2.41E+00	1.99E+00	1.68E+00	1.47E+00
1.20	3.00E+00	2.27E+00	2.14E+00	1.84E+00	1.41E+00	1.07E+00	8.48E−01
1.50	2.19E+00	1.52E+00	1.40E+00	1.12E+00	7.73E−01	5.36E−01	4.00E−01
1.70	1.76E+00	1.13E+00	1.02E+00	7.81E−01	5.12E−01	3.54E−01	2.70E−01
2.00	1.25E+00	7.07E−01	6.25E−01	4.54E−01	2.92E−01	2.14E−01	1.79E−01
2.50	6.88E−01	3.44E−01	2.99E−01	2.14E−01	1.48E−01	1.28E−01	1.28E−01
3.00	3.91E−01	1.96E−01	1.73E−01	1.30E−01	9.89E−02	9.49E−02	1.03E−01
3.50	2.44E−01	1.35E−01	1.21E−01	9.65E−02	7.72E−02	7.13E−02	7.11E−02
4.00	1.69E−01	1.05E−01	9.74E−02	8.13E−02	6.36E−02	5.09E−02	4.20E−02
5.00	1.04E−01	7.50E−02	7.08E−02	6.00E−02	4.15E−02	2.48E−02	1.48E−02
6.00	7.45E−02	5.16E−02	4.78E−02	3.82E−02	2.37E−02	1.31E−02	7.44E−03
7.00	5.49E−02	3.29E−02	2.94E−02	2.16E−02	1.26E−02	7.31E−03	4.66E−03
8.00	3.96E−02	2.02E−02	1.74E−02	1.18E−02	6.62E−03	4.14E−03	3.01E−03
9.00	2.77E−02	1.23E−02	1.03E−02	6.56E−03	3.54E−03	2.34E−03	1.87E−03
10.00	1.90E−02	7.51E−03	6.15E−03	3.74E−03	1.96E−03	1.33E−03	1.12E−03
12.50	7.17E−03	2.32E−03	1.83E−03	1.03E−03	5.05E−04	3.41E−04	2.95E−04
15.00	2.77E−03	7.88E−04	6.11E−04	3.29E−04	1.53E−04	9.88E−05	8.26E−05
17.50	1.14E−03	2.98E−04	2.28E−04	1.19E−04	5.31E−05	3.26E−05	2.59E−05
20.00	4.98E−04	1.24E−04	9.46E−05	4.87E−05	2.11E−05	1.24E−05	9.33E−06
22.50	2.35E−04	5.74E−05	4.36E−05	2.24E−05	9.58E−06	5.44E−06	3.94E−06
25.00	1.18E−04	2.91E−05	2.22E−05	1.16E−05	5.00E−06	2.81E−06	1.98E−06
27.50	6.37E−05	1.61E−05	1.24E−05	6.64E−06	2.98E−06	1.69E−06	1.19E−06
30.00	3.65E−05	9.69E−06	7.57E−06	4.22E−06	2.00E−06	1.18E−06	8.30E−07
35.00	1.42E−05	4.37E−06	3.54E−06	2.18E−06	1.17E−06	7.22E−07	5.08E−07
40.00	6.80E−06	2.53E−06	2.15E−06	1.48E−06	8.99E−07	5.76E−07	3.96E−07
45.00	3.89E−06	1.79E−06	1.59E−06	1.22E−06	8.20E−07	5.26E−07	3.40E−07
50.00	2.56E−06	1.43E−06	1.32E−06	1.10E−06	7.89E−07	4.87E−07	2.89E−07
55.00	1.89E−06	1.25E−06	1.19E−06	1.06E−06	7.93E−07	4.70E−07	2.57E−07
60.00	1.51E−06	1.14E−06	1.12E−06	1.05E−06	8.12E−07	4.71E−07	2.47E−07
65.00	1.28E−06	1.07E−06	1.06E−06	1.03E−06	8.13E−07	4.69E−07	2.41E−07
70.00	1.14E−06	1.03E−06	1.03E−06	1.02E−06	8.24E−07	4.80E−07	2.49E−07
75.00	1.06E−06	1.00E−06	1.01E−06	1.02E−06	8.39E−07	5.01E−07	2.66E−07
80.00	1.01E−06	9.86E−07	9.99E−07	1.01E−06	8.48E−07	5.21E−07	2.87E−07
85.00	9.85E−07	9.77E−07	9.92E−07	1.01E−06	8.59E−07	5.47E−07	3.15E−07
90.00	9.87E−07	9.96E−07	1.01E−06	1.03E−06	8.92E−07	5.87E−07	3.52E−07
95.00	1.00E−06	1.02E−06	1.04E−06	1.06E−06	9.27E−07	6.29E−07	3.90E−07
105.00	1.08E−06	1.11E−06	1.12E−06	1.15E−06	1.02E−06	7.36E−07	4.91E−07
120.00	1.28E−06	1.32E−06	1.33E−06	1.36E−06	1.24E−06	9.48E−07	6.84E−07
135.00	1.54E−06	1.58E−06	1.60E−06	1.63E−06	1.50E−06	1.19E−06	8.98E−07
150.00	1.79E−06	1.84E−06	1.86E−06	1.88E−06	1.75E−06	1.42E−06	1.11E−06
165.00	1.97E−06	2.02E−06	2.04E−06	2.06E−06	1.93E−06	1.60E−06	1.27E−06
180.00	2.04E−06	2.09E−06	2.11E−06	2.13E−06	2.00E−06	1.66E−06	1.33E−06
total	2.44E−02	1.60E−02	1.48E−02	1.22E−02	9.28E−03	7.55E−03	6.65E−03
rel ff	2.51E−02	1.64E−02	1.51E−02	1.23E−02	9.34E−03	7.68E−03	6.78E−03
nrl ff	2.52E−02	1.65E−02	1.52E−02	1.24E−02	9.39E−03	7.71E−03	6.81E−03

TABLE 1. Predicted *S*-matrix differential elastic scattering cross sections for photon energies (50.0, 59.54, 145.4, 316.5, 411.8, 468.1, 661.6, 778.9, 964.0, 1004.8, 1112.1, 1274.5, 1408.0 and 1500.0). The angle integrated total cross sections for each element and energies are presented. ''total'' represents total cross sections from this work, ''rel ff'' represents total cross sections calculated from the relativistic form factor and ''nrl ff'' represents total cross sections calculated from the nonrelativistic form factor—Continued[a]

θ (deg)	Photon energy (keV)						
	50.0	59.5	145.4	316.5	411.8	468.1	661.6
Potassium ($Z=19$)							
0.00	2.87E+01	2.87E+01	2.86E+01	2.86E+01	2.86E+01	2.86E+01	2.86E+01
0.01	2.87E+01	2.87E+01	2.86E+01	2.86E+01	2.86E+01	2.86E+01	2.86E+01
0.02	2.87E+01	2.87E+01	2.86E+01	2.86E+01	2.85E+01	2.85E+01	2.85E+01
0.04	2.87E+01	2.87E+01	2.86E+01	2.85E+01	2.84E+01	2.83E+01	2.81E+01
0.06	2.87E+01	2.87E+01	2.86E+01	2.83E+01	2.82E+01	2.81E+01	2.76E+01
0.10	2.87E+01	2.87E+01	2.85E+01	2.79E+01	2.75E+01	2.72E+01	2.60E+01
0.20	2.87E+01	2.86E+01	2.80E+01	2.62E+01	2.49E+01	2.42E+01	2.16E+01
0.30	2.86E+01	2.85E+01	2.74E+01	2.41E+01	2.21E+01	2.11E+01	1.80E+01
0.40	2.84E+01	2.83E+01	2.66E+01	2.20E+01	1.97E+01	1.86E+01	1.52E+01
0.50	2.83E+01	2.81E+01	2.56E+01	2.01E+01	1.77E+01	1.64E+01	1.27E+01
0.60	2.82E+01	2.79E+01	2.46E+01	1.85E+01	1.59E+01	1.45E+01	1.05E+01
0.70	2.80E+01	2.76E+01	2.36E+01	1.70E+01	1.42E+01	1.28E+01	8.67E+00
0.80	2.78E+01	2.73E+01	2.26E+01	1.56E+01	1.27E+01	1.12E+01	7.25E+00
1.00	2.73E+01	2.66E+01	2.08E+01	1.31E+01	1.00E+01	8.60E+00	5.32E+00
1.20	2.67E+01	2.58E+01	1.92E+01	1.10E+01	7.96E+00	6.73E+00	4.19E+00
1.50	2.55E+01	2.45E+01	1.71E+01	8.43E+00	5.84E+00	4.93E+00	3.19E+00
1.70	2.47E+01	2.37E+01	1.59E+01	7.14E+00	4.93E+00	4.17E+00	2.71E+00
2.00	2.36E+01	2.25E+01	1.41E+01	5.70E+00	4.00E+00	3.38E+00	2.10E+00
2.50	2.20E+01	2.07E+01	1.15E+01	4.20E+00	3.04E+00	2.51E+00	1.29E+00
3.00	2.08E+01	1.91E+01	9.33E+00	3.32E+00	2.35E+00	1.85E+00	7.69E−01
3.50	1.97E+01	1.76E+01	7.62E+00	2.70E+00	1.78E+00	1.32E+00	4.68E−01
4.00	1.87E+01	1.63E+01	6.33E+00	2.20E+00	1.31E+00	9.29E−01	3.04E−01
5.00	1.64E+01	1.39E+01	4.66E+00	1.42E+00	6.85E−01	4.67E−01	1.65E−01
6.00	1.39E+01	1.17E+01	3.70E+00	8.85E−01	3.78E−01	2.61E−01	1.15E−01
7.00	1.15E+01	9.88E+00	3.06E+00	5.55E−01	2.35E−01	1.69E−01	8.88E−02
8.00	9.57E+00	8.34E+00	2.55E+00	3.62E−01	1.66E−01	1.23E−01	6.94E−02
9.00	8.06E+00	7.09E+00	2.11E+00	2.51E−01	1.30E−01	9.85E−02	5.33E−02
10.00	6.94E+00	6.11E+00	1.72E+00	1.86E−01	1.08E−01	8.23E−02	4.02E−02
12.50	5.32E+00	4.48E+00	9.80E−01	1.10E−01	7.25E−02	5.39E−02	1.87E−02
15.00	4.56E+00	3.54E+00	5.54E−01	7.83E−02	4.79E−02	3.31E−02	8.44E−03
17.50	4.04E+00	2.90E+00	3.33E−01	5.82E−02	3.02E−02	1.93E−02	3.88E−03
20.00	3.52E+00	2.39E+00	2.20E−01	4.26E−02	1.85E−02	1.10E−02	1.85E−03
22.50	2.94E+00	1.94E+00	1.60E−01	3.03E−02	1.13E−02	6.29E−03	9.18E−04
25.00	2.35E+00	1.56E+00	1.26E−01	2.11E−02	6.87E−03	3.63E−03	4.77E−04
27.50	1.83E+00	1.23E+00	1.04E−01	1.45E−02	4.22E−03	2.14E−03	2.59E−04
30.00	1.40E+00	9.64E−01	8.82E−02	9.88E−03	2.63E−03	1.28E−03	1.47E−04
35.00	8.09E−01	5.90E−01	6.49E−02	4.62E−03	1.07E−03	4.94E−04	5.40E−05
40.00	4.83E−01	3.70E−01	4.73E−02	2.22E−03	4.66E−04	2.09E−04	2.32E−05
45.00	3.08E−01	2.45E−01	3.38E−02	1.11E−03	2.19E−04	9.68E−05	1.16E−05
50.00	2.13E−01	1.72E−01	2.37E−02	5.77E−04	1.10E−04	4.90E−05	6.63E−06
55.00	1.58E−01	1.28E−01	1.65E−02	3.15E−04	5.94E−05	2.69E−05	4.25E−06
60.00	1.25E−01	1.00E−01	1.15E−02	1.81E−04	3.44E−05	1.60E−05	3.01E−06
65.00	1.04E−01	8.18E−02	8.10E−03	1.09E−04	2.13E−05	1.03E−05	2.31E−06
70.00	8.99E−02	6.89E−02	5.78E−03	6.94E−05	1.41E−05	7.07E−06	1.90E−06
75.00	7.98E−02	5.96E−02	4.21E−03	4.64E−05	9.92E−06	5.20E−06	1.65E−06
80.00	7.25E−02	5.27E−02	3.14E−03	3.27E−05	7.43E−06	4.05E−06	1.49E−06
85.00	6.72E−02	4.75E−02	2.40E−03	2.43E−05	5.89E−06	3.34E−06	1.39E−06
90.00	6.34E−02	4.37E−02	1.90E−03	1.90E−05	4.91E−06	2.89E−06	1.35E−06
95.00	6.09E−02	4.10E−02	1.54E−03	1.55E−05	4.28E−06	2.61E−06	1.33E−06
105.00	5.87E−02	3.78E−02	1.11E−03	1.16E−05	3.62E−06	2.34E−06	1.38E−06
120.00	6.00E−02	3.65E−02	8.03E−04	9.15E−06	3.37E−06	2.32E−06	1.59E−06
135.00	6.37E−02	3.73E−02	6.66E−04	8.34E−06	3.46E−06	2.50E−06	1.86E−06
150.00	6.76E−02	3.84E−02	5.98E−04	8.11E−06	3.66E−06	2.73E−06	2.14E−06
165.00	7.03E−02	3.93E−02	5.65E−04	8.07E−06	3.82E−06	2.90E−06	2.34E−06
180.00	7.12E−02	3.96E−02	5.55E−04	8.07E−06	3.89E−06	2.96E−06	2.41E−06
total	5.18E+00	3.94E+00	7.59E−01	1.68E−01	1.01E−01	7.78E−02	3.92E−02
rel ff	5.30E+00	3.94E+00	7.72E−01	1.71E−01	1.02E−01	7.93E−02	3.99E−02
nrl ff	5.33E+00	3.97E+00	7.77E−01	1.72E−01	1.03E−01	7.99E−02	4.01E−02

TABLE 1. Predicted *S*-matrix differential elastic scattering cross sections for photon energies (50.0, 59.54, 145.4, 316.5, 411.8, 468.1, 661.6, 778.9, 964.0, 1004.8, 1112.1, 1274.5, 1408.0 and 1500.0). The angle integrated total cross sections for each element and energies are presented. ''total'' represents total cross sections from this work, ''rel ff'' represents total cross sections calculated from the relativistic form factor and ''nrl ff'' represents total cross sections calculated from the nonrelativistic form factor—Continued[a]

θ (deg)	Photon energy (keV)						
	778.9	964.0	1004.8	1112.1	1274.5	1408.0	1500.0
Potassium ($Z=19$)							
0.00	2.86E+01	2.86E+01	2.86E+01	2.86E+01	2.86E+01	2.86E+01	2.86E+01
0.01	2.85E+01	2.85E+01	2.85E+01	2.85E+01	2.85E+01	2.85E+01	2.84E+01
0.02	2.84E+01	2.83E+01	2.83E+01	2.82E+01	2.81E+01	2.80E+01	2.80E+01
0.04	2.79E+01	2.76E+01	2.76E+01	2.74E+01	2.70E+01	2.67E+01	2.64E+01
0.06	2.72E+01	2.66E+01	2.64E+01	2.60E+01	2.54E+01	2.48E+01	2.44E+01
0.10	2.52E+01	2.39E+01	2.36E+01	2.29E+01	2.19E+01	2.12E+01	2.08E+01
0.20	2.02E+01	1.83E+01	1.79E+01	1.69E+01	1.56E+01	1.46E+01	1.40E+01
0.30	1.64E+01	1.42E+01	1.37E+01	1.26E+01	1.09E+01	9.59E+00	8.71E+00
0.40	1.33E+01	1.08E+01	1.03E+01	9.12E+00	7.56E+00	6.49E+00	5.85E+00
0.50	1.07E+01	8.21E+00	7.76E+00	6.72E+00	5.51E+00	4.81E+00	4.46E+00
0.60	8.58E+00	6.37E+00	5.99E+00	5.17E+00	4.31E+00	3.89E+00	3.74E+00
0.70	6.98E+00	5.13E+00	4.83E+00	4.19E+00	3.56E+00	3.29E+00	3.22E+00
0.80	5.80E+00	4.30E+00	4.07E+00	3.56E+00	3.05E+00	2.79E+00	2.69E+00
1.00	4.29E+00	3.29E+00	3.13E+00	2.76E+00	2.27E+00	1.90E+00	1.65E+00
1.20	3.41E+00	2.62E+00	2.48E+00	2.14E+00	1.63E+00	1.21E+00	9.26E−01
1.50	2.53E+00	1.80E+00	1.66E+00	1.33E+00	9.04E−01	6.05E−01	4.34E−01
1.70	2.07E+00	1.34E+00	1.22E+00	9.32E−01	6.01E−01	4.02E−01	2.96E−01
2.00	1.49E+00	8.45E−01	7.46E−01	5.41E−01	3.43E−01	2.47E−01	2.03E−01
2.50	8.19E−01	4.05E−01	3.51E−01	2.50E−01	1.72E−01	1.51E−01	1.54E−01
3.00	4.61E−01	2.26E−01	1.98E−01	1.48E−01	1.14E−01	1.13E−01	1.29E−01
3.50	2.84E−01	1.53E−01	1.37E−01	1.09E−01	8.85E−02	8.54E−02	8.96E−02
4.00	1.94E−01	1.19E−01	1.10E−01	9.15E−02	7.31E−02	6.06E−02	5.21E−02
5.00	1.17E−01	8.52E−02	8.05E−02	6.88E−02	4.82E−02	2.91E−02	1.74E−02
6.00	8.47E−02	5.99E−02	5.57E−02	4.50E−02	2.80E−02	1.51E−02	8.35E−03
7.00	6.34E−02	3.93E−02	3.54E−02	2.62E−02	1.51E−02	8.36E−03	5.03E−03
8.00	4.67E−02	2.49E−02	2.16E−02	1.48E−02	8.05E−03	4.70E−03	3.16E−03
9.00	3.34E−02	1.55E−02	1.31E−02	8.36E−03	4.36E−03	2.65E−03	1.93E−03
10.00	2.34E−02	9.68E−03	7.97E−03	4.84E−03	2.42E−03	1.50E−03	1.14E−03
12.50	9.30E−03	3.11E−03	2.46E−03	1.37E−03	6.30E−04	3.83E−04	2.98E−04
15.00	3.73E−03	1.09E−03	8.40E−04	4.44E−04	1.92E−04	1.12E−04	8.43E−05
17.50	1.57E−03	4.16E−04	3.18E−04	1.63E−04	6.75E−05	3.76E−05	2.73E−05
20.00	6.98E−04	1.75E−04	1.33E−04	6.69E−05	2.71E−05	1.47E−05	1.03E−05
22.50	3.31E−04	8.08E−05	6.10E−05	3.08E−05	1.25E−05	6.69E−06	4.61E−06
25.00	1.68E−04	4.07E−05	3.09E−05	1.58E−05	6.58E−06	3.58E−06	2.47E−06
27.50	8.99E−05	2.23E−05	1.70E−05	8.97E−06	3.94E−06	2.23E−06	1.57E−06
30.00	5.11E−05	1.32E−05	1.02E−05	5.62E−06	2.66E−06	1.59E−06	1.16E−06
35.00	1.95E−05	5.72E−06	4.61E−06	2.80E−06	1.54E−06	1.03E−06	7.90E−07
40.00	9.05E−06	3.19E−06	2.69E−06	1.84E−06	1.18E−06	8.46E−07	6.60E−07
45.00	5.02E−06	2.18E−06	1.92E−06	1.47E−06	1.06E−06	7.81E−07	5.85E−07
50.00	3.21E−06	1.70E−06	1.56E−06	1.30E−06	1.01E−06	7.21E−07	4.98E−07
55.00	2.31E−06	1.45E−06	1.38E−06	1.24E−06	1.00E−06	6.86E−07	4.35E−07
60.00	1.81E−06	1.31E−06	1.28E−06	1.22E−06	1.02E−06	6.75E−07	4.05E−07
65.00	1.51E−06	1.22E−06	1.21E−06	1.19E−06	1.01E−06	6.60E−07	3.82E−07
70.00	1.33E−06	1.16E−06	1.17E−06	1.18E−06	1.02E−06	6.66E−07	3.83E−07
75.00	1.23E−06	1.13E−06	1.15E−06	1.18E−06	1.04E−06	6.83E−07	3.98E−07
80.00	1.16E−06	1.11E−06	1.13E−06	1.17E−06	1.05E−06	7.03E−07	4.19E−07
85.00	1.13E−06	1.10E−06	1.13E−06	1.17E−06	1.06E−06	7.30E−07	4.51E−07
90.00	1.13E−06	1.13E−06	1.15E−06	1.20E−06	1.10E−06	7.76E−07	4.95E−07
95.00	1.14E−06	1.16E−06	1.18E−06	1.23E−06	1.14E−06	8.24E−07	5.41E−07
105.00	1.22E−06	1.25E−06	1.28E−06	1.33E−06	1.25E−06	9.50E−07	6.65E−07
120.00	1.45E−06	1.49E−06	1.51E−06	1.57E−06	1.49E−06	1.20E−06	9.01E−07
135.00	1.74E−06	1.79E−06	1.82E−06	1.88E−06	1.80E−06	1.49E−06	1.16E−06
150.00	2.02E−06	2.07E−06	2.10E−06	2.16E−06	2.08E−06	1.76E−06	1.41E−06
165.00	2.22E−06	2.28E−06	2.31E−06	2.37E−06	2.29E−06	1.96E−06	1.60E−06
180.00	2.29E−06	2.36E−06	2.39E−06	2.45E−06	2.37E−06	2.04E−06	1.67E−06
total	2.82E−02	1.85E−02	1.71E−02	1.40E−02	1.07E−02	8.66E−03	7.63E−03
rel ff	2.88E−02	1.88E−02	1.73E−02	1.41E−02	1.07E−02	8.82E−03	7.79E−03
nrl ff	2.90E−02	1.90E−02	1.74E−02	1.42E−02	1.08E−02	8.88E−03	7.84E−03

TABLE 1. Predicted *S*-matrix differential elastic scattering cross sections for photon energies (50.0, 59.54, 145.4, 316.5, 411.8, 468.1, 661.6, 778.9, 964.0, 1004.8, 1112.1, 1274.5, 1408.0 and 1500.0). The angle integrated total cross sections for each element and energies are presented. ''total'' represents total cross sections from this work, ''rel ff'' represents total cross sections calculated from the relativistic form factor and ''nrl ff'' represents total cross sections calculated from the nonrelativistic form factor—Continued[a]

θ (deg)	Photon energy (keV)						
	50.0	59.5	145.4	316.5	411.8	468.1	661.6
Calcium ($Z=20$)							
0.00	3.18E+01	3.18E+01	3.17E+01	3.17E+01	3.17E+01	3.17E+01	3.17E+01
0.01	3.18E+01	3.18E+01	3.17E+01	3.17E+01	3.17E+01	3.16E+01	3.16E+01
0.02	3.18E+01	3.18E+01	3.17E+01	3.16E+01	3.16E+01	3.16E+01	3.15E+01
0.04	3.18E+01	3.18E+01	3.17E+01	3.16E+01	3.15E+01	3.14E+01	3.11E+01
0.06	3.18E+01	3.18E+01	3.16E+01	3.14E+01	3.12E+01	3.11E+01	3.06E+01
0.10	3.18E+01	3.18E+01	3.15E+01	3.09E+01	3.05E+01	3.02E+01	2.89E+01
0.20	3.18E+01	3.17E+01	3.11E+01	2.91E+01	2.77E+01	2.69E+01	2.42E+01
0.30	3.17E+01	3.16E+01	3.04E+01	2.68E+01	2.47E+01	2.36E+01	2.03E+01
0.40	3.15E+01	3.14E+01	2.95E+01	2.46E+01	2.21E+01	2.09E+01	1.71E+01
0.50	3.14E+01	3.11E+01	2.85E+01	2.25E+01	1.99E+01	1.85E+01	1.42E+01
0.60	3.13E+01	3.09E+01	2.74E+01	2.07E+01	1.79E+01	1.63E+01	1.18E+01
0.70	3.11E+01	3.06E+01	2.63E+01	1.91E+01	1.60E+01	1.44E+01	9.74E+00
0.80	3.09E+01	3.03E+01	2.53E+01	1.75E+01	1.43E+01	1.26E+01	8.12E+00
1.00	3.03E+01	2.95E+01	2.33E+01	1.48E+01	1.13E+01	9.66E+00	5.95E+00
1.20	2.96E+01	2.87E+01	2.16E+01	1.24E+01	8.93E+00	7.54E+00	4.70E+00
1.50	2.84E+01	2.73E+01	1.92E+01	9.47E+00	6.54E+00	5.53E+00	3.60E+00
1.70	2.75E+01	2.64E+01	1.78E+01	8.00E+00	5.52E+00	4.68E+00	3.08E+00
2.00	2.63E+01	2.52E+01	1.59E+01	6.38E+00	4.49E+00	3.81E+00	2.41E+00
2.50	2.46E+01	2.32E+01	1.29E+01	4.72E+00	3.44E+00	2.86E+00	1.51E+00
3.00	2.33E+01	2.14E+01	1.05E+01	3.74E+00	2.69E+00	2.13E+00	9.02E−01
3.50	2.22E+01	1.98E+01	8.55E+00	3.06E+00	2.06E+00	1.54E+00	5.48E−01
4.00	2.10E+01	1.83E+01	7.09E+00	2.52E+00	1.52E+00	1.09E+00	3.54E−01
5.00	1.85E+01	1.56E+01	5.22E+00	1.65E+00	8.03E−01	5.47E−01	1.89E−01
6.00	1.56E+01	1.32E+01	4.16E+00	1.04E+00	4.41E−01	3.04E−01	1.30E−01
7.00	1.30E+01	1.11E+01	3.46E+00	6.50E−01	2.72E−01	1.94E−01	1.00E−01
8.00	1.07E+01	9.36E+00	2.91E+00	4.23E−01	1.90E−01	1.40E−01	7.87E−02
9.00	9.01E+00	7.96E+00	2.42E+00	2.92E−01	1.47E−01	1.11E−01	6.12E−02
10.00	7.73E+00	6.85E+00	1.99E+00	2.14E−01	1.22E−01	9.30E−02	4.69E−02
12.50	5.92E+00	5.03E+00	1.15E+00	1.25E−01	8.21E−02	6.16E−02	2.28E−02
15.00	5.08E+00	3.99E+00	6.50E−01	8.86E−02	5.53E−02	3.89E−02	1.07E−02
17.50	4.54E+00	3.29E+00	3.88E−01	6.63E−02	3.58E−02	2.34E−02	5.07E−03
20.00	4.00E+00	2.73E+00	2.54E−01	4.92E−02	2.26E−02	1.38E−02	2.47E−03
22.50	3.38E+00	2.24E+00	1.84E−01	3.57E−02	1.41E−02	8.06E−03	1.24E−03
25.00	2.74E+00	1.81E+00	1.43E−01	2.53E−02	8.76E−03	4.75E−03	6.54E−04
27.50	2.16E+00	1.44E+00	1.18E−01	1.78E−02	5.48E−03	2.84E−03	3.58E−04
30.00	1.66E+00	1.13E+00	9.96E−02	1.24E−02	3.47E−03	1.73E−03	2.04E−04
35.00	9.64E−01	6.94E−01	7.35E−02	5.96E−03	1.44E−03	6.77E−04	7.45E−05
40.00	5.74E−01	4.35E−01	5.42E−02	2.93E−03	6.38E−04	2.89E−04	3.16E−05
45.00	3.63E−01	2.85E−01	3.93E−02	1.49E−03	3.01E−04	1.34E−04	1.55E−05
50.00	2.48E−01	1.99E−01	2.81E−02	7.86E−04	1.52E−04	6.76E−05	8.66E−06
55.00	1.82E−01	1.47E−01	1.99E−02	4.33E−04	8.20E−05	3.69E−05	5.43E−06
60.00	1.43E−01	1.15E−01	1.41E−02	2.50E−04	4.72E−05	2.17E−05	3.76E−06
65.00	1.18E−01	9.33E−02	1.01E−02	1.51E−04	2.90E−05	1.38E−05	2.84E−06
70.00	1.01E−01	7.84E−02	7.29E−03	9.61E−05	1.91E−05	9.38E−06	2.29E−06
75.00	8.91E−02	6.77E−02	5.37E−03	6.42E−05	1.33E−05	6.81E−06	1.97E−06
80.00	8.07E−02	5.98E−02	4.05E−03	4.52E−05	9.87E−06	5.25E−06	1.76E−06
85.00	7.46E−02	5.40E−02	3.13E−03	3.34E−05	7.75E−06	4.29E−06	1.64E−06
90.00	7.04E−02	4.97E−02	2.49E−03	2.60E−05	6.41E−06	3.68E−06	1.57E−06
95.00	6.77E−02	4.67E−02	2.04E−03	2.11E−05	5.55E−06	3.29E−06	1.55E−06
105.00	6.55E−02	4.33E−02	1.48E−03	1.56E−05	4.63E−06	2.91E−06	1.60E−06
120.00	6.75E−02	4.23E−02	1.09E−03	1.22E−05	4.22E−06	2.84E−06	1.82E−06
135.00	7.23E−02	4.36E−02	9.09E−04	1.10E−05	4.28E−06	3.01E−06	2.12E−06
150.00	7.73E−02	4.53E−02	8.20E−04	1.06E−05	4.48E−06	3.25E−06	2.43E−06
165.00	8.07E−02	4.65E−02	7.77E−04	1.05E−05	4.65E−06	3.44E−06	2.65E−06
180.00	8.19E−02	4.70E−02	7.64E−04	1.05E−05	4.72E−06	3.51E−06	2.73E−06
total	5.90E+00	4.50E+00	8.70E−01	1.93E−01	1.15E−01	8.93E−02	4.50E−02
rel ff	5.98E+00	4.45E+00	8.78E−01	1.95E−01	1.17E−01	9.05E−02	4.55E−02
nrl ff	6.02E+00	4.48E+00	8.83E−01	1.96E−01	1.17E−01	9.11E−02	4.58E−02

TABLE 1. Predicted *S*-matrix differential elastic scattering cross sections for photon energies (50.0, 59.54, 145.4, 316.5, 411.8, 468.1, 661.6, 778.9, 964.0, 1004.8, 1112.1, 1274.5, 1408.0 and 1500.0). The angle integrated total cross sections for each element and energies are presented. ''total'' represents total cross sections from this work, ''rel ff'' represents total cross sections calculated from the relativistic form factor and ''nrl ff'' represents total cross sections calculated from the nonrelativistic form factor—Continued[a]

θ (deg)	Photon energy (keV)						
	778.9	964.0	1004.8	1112.1	1274.5	1408.0	1500.0
Calcium ($Z=20$)							
0.00	3.17E+01	3.17E+01	3.17E+01	3.17E+01	3.16E+01	3.17E+01	3.17E+01
0.01	3.16E+01	3.16E+01	3.16E+01	3.16E+01	3.15E+01	3.15E+01	3.15E+01
0.02	3.15E+01	3.14E+01	3.14E+01	3.13E+01	3.12E+01	3.11E+01	3.10E+01
0.04	3.10E+01	3.06E+01	3.06E+01	3.03E+01	2.99E+01	2.96E+01	2.93E+01
0.06	3.02E+01	2.95E+01	2.93E+01	2.89E+01	2.82E+01	2.75E+01	2.71E+01
0.10	2.81E+01	2.67E+01	2.64E+01	2.56E+01	2.44E+01	2.36E+01	2.32E+01
0.20	2.27E+01	2.05E+01	2.01E+01	1.90E+01	1.75E+01	1.63E+01	1.56E+01
0.30	1.85E+01	1.60E+01	1.55E+01	1.42E+01	1.23E+01	1.08E+01	9.87E+00
0.40	1.50E+01	1.22E+01	1.16E+01	1.03E+01	8.56E+00	7.40E+00	6.72E+00
0.50	1.20E+01	9.21E+00	8.71E+00	7.55E+00	6.24E+00	5.50E+00	5.16E+00
0.60	9.63E+00	7.14E+00	6.72E+00	5.80E+00	4.87E+00	4.44E+00	4.32E+00
0.70	7.82E+00	5.74E+00	5.41E+00	4.70E+00	4.01E+00	3.74E+00	3.69E+00
0.80	6.49E+00	4.82E+00	4.56E+00	4.00E+00	3.43E+00	3.16E+00	3.05E+00
1.00	4.82E+00	3.71E+00	3.53E+00	3.11E+00	2.56E+00	2.13E+00	1.83E+00
1.20	3.85E+00	2.99E+00	2.83E+00	2.44E+00	1.85E+00	1.35E+00	1.02E+00
1.50	2.89E+00	2.08E+00	1.92E+00	1.55E+00	1.04E+00	6.84E−01	4.79E−01
1.70	2.38E+00	1.57E+00	1.42E+00	1.09E+00	6.99E−01	4.59E−01	3.31E−01
2.00	1.73E+00	9.92E−01	8.77E−01	6.37E−01	4.01E−01	2.85E−01	2.31E−01
2.50	9.59E−01	4.74E−01	4.10E−01	2.91E−01	2.00E−01	1.76E−01	1.81E−01
3.00	5.39E−01	2.62E−01	2.29E−01	1.69E−01	1.31E−01	1.33E−01	1.54E−01
3.50	3.29E−01	1.74E−01	1.56E−01	1.23E−01	1.01E−01	9.99E−02	1.08E−01
4.00	2.23E−01	1.35E−01	1.24E−01	1.03E−01	8.29E−02	7.07E−02	6.27E−02
5.00	1.33E−01	9.59E−02	9.06E−02	7.76E−02	5.50E−02	3.38E−02	2.06E−02
6.00	9.58E−02	6.83E−02	6.37E−02	5.18E−02	3.25E−02	1.75E−02	9.59E−03
7.00	7.22E−02	4.60E−02	4.16E−02	3.11E−02	1.79E−02	9.63E−03	5.58E−03
8.00	5.40E−02	2.99E−02	2.61E−02	1.80E−02	9.71E−03	5.39E−03	3.41E−03
9.00	3.94E−02	1.91E−02	1.62E−02	1.05E−02	5.33E−03	3.03E−03	2.05E−03
10.00	2.82E−02	1.22E−02	1.01E−02	6.17E−03	2.99E−03	1.72E−03	1.21E−03
12.50	1.18E−02	4.07E−03	3.24E−03	1.80E−03	7.90E−04	4.41E−04	3.15E−04
15.00	4.88E−03	1.46E−03	1.13E−03	5.92E−04	2.43E−04	1.30E−04	9.09E−05
17.50	2.11E−03	5.70E−04	4.34E−04	2.19E−04	8.64E−05	4.48E−05	3.03E−05
20.00	9.54E−04	2.42E−04	1.83E−04	9.07E−05	3.51E−05	1.79E−05	1.19E−05
22.50	4.57E−04	1.12E−04	8.41E−05	4.17E−05	1.63E−05	8.33E−06	5.53E−06
25.00	2.32E−04	5.60E−05	4.23E−05	2.13E−05	8.62E−06	4.56E−06	3.09E−06
27.50	1.24E−04	3.04E−05	2.31E−05	1.20E−05	5.16E−06	2.90E−06	2.05E−06
30.00	7.04E−05	1.78E−05	1.37E−05	7.42E−06	3.47E−06	2.11E−06	1.58E−06
35.00	2.64E−05	7.46E−06	5.96E−06	3.58E−06	1.99E−06	1.39E−06	1.14E−06
40.00	1.20E−05	4.01E−06	3.35E−06	2.26E−06	1.49E−06	1.16E−06	9.96E−07
45.00	6.46E−06	2.65E−06	2.31E−06	1.76E−06	1.32E−06	1.08E−06	9.05E−07
50.00	4.02E−06	2.00E−06	1.82E−06	1.52E−06	1.24E−06	9.91E−07	7.74E−07
55.00	2.82E−06	1.68E−06	1.58E−06	1.42E−06	1.22E−06	9.32E−07	6.67E−07
60.00	2.16E−06	1.49E−06	1.45E−06	1.38E−06	1.23E−06	9.06E−07	6.07E−07
65.00	1.78E−06	1.37E−06	1.36E−06	1.35E−06	1.22E−06	8.74E−07	5.60E−07
70.00	1.55E−06	1.31E−06	1.31E−06	1.33E−06	1.22E−06	8.71E−07	5.47E−07
75.00	1.41E−06	1.27E−06	1.29E−06	1.33E−06	1.24E−06	8.83E−07	5.55E−07
80.00	1.33E−06	1.25E−06	1.27E−06	1.33E−06	1.25E−06	9.00E−07	5.74E−07
85.00	1.28E−06	1.24E−06	1.26E−06	1.33E−06	1.26E−06	9.28E−07	6.07E−07
90.00	1.28E−06	1.26E−06	1.29E−06	1.36E−06	1.30E−06	9.79E−07	6.56E−07
95.00	1.29E−06	1.30E−06	1.33E−06	1.40E−06	1.35E−06	1.03E−06	7.09E−07
105.00	1.38E−06	1.40E−06	1.44E−06	1.52E−06	1.48E−06	1.18E−06	8.52E−07
120.00	1.63E−06	1.67E−06	1.70E−06	1.79E−06	1.76E−06	1.47E−06	1.13E−06
135.00	1.95E−06	2.01E−06	2.04E−06	2.13E−06	2.11E−06	1.79E−06	1.43E−06
150.00	2.25E−06	2.32E−06	2.36E−06	2.46E−06	2.43E−06	2.11E−06	1.72E−06
165.00	2.48E−06	2.55E−06	2.59E−06	2.69E−06	2.66E−06	2.34E−06	1.94E−06
180.00	2.56E−06	2.63E−06	2.67E−06	2.77E−06	2.75E−06	2.42E−06	2.02E−06
total	3.24E−02	2.13E−02	1.96E−02	1.61E−02	1.22E−02	9.86E−03	8.70E−03
rel ff	3.29E−02	2.15E−02	1.98E−02	1.61E−02	1.23E−02	1.01E−02	8.89E−03
nrl ff	3.31E−02	2.16E−02	1.99E−02	1.62E−02	1.23E−02	1.01E−02	8.95E−03

TABLE 1. Predicted *S*-matrix differential elastic scattering cross sections for photon energies (50.0, 59.54, 145.4, 316.5, 411.8, 468.1, 661.6, 778.9, 964.0, 1004.8, 1112.1, 1274.5, 1408.0 and 1500.0). The angle integrated total cross sections for each element and energies are presented. ''total'' represents total cross sections from this work, ''rel ff'' represents total cross sections calculated from the relativistic form factor and ''nrl ff'' represents total cross sections calculated from the nonrelativistic form factor—Continued[a]

θ (deg)	Photon energy (keV)						
	50.0	59.5	145.4	316.5	411.8	468.1	661.6
Scandium ($Z=21$)							
0.00	3.51E+01	3.51E+01	3.49E+01	3.49E+01	3.49E+01	3.49E+01	3.49E+01
0.01	3.51E+01	3.51E+01	3.49E+01	3.49E+01	3.49E+01	3.49E+01	3.49E+01
0.02	3.51E+01	3.51E+01	3.49E+01	3.49E+01	3.49E+01	3.48E+01	3.48E+01
0.04	3.51E+01	3.51E+01	3.49E+01	3.48E+01	3.47E+01	3.47E+01	3.44E+01
0.06	3.51E+01	3.51E+01	3.49E+01	3.47E+01	3.45E+01	3.43E+01	3.38E+01
0.10	3.51E+01	3.50E+01	3.48E+01	3.42E+01	3.38E+01	3.35E+01	3.22E+01
0.20	3.50E+01	3.50E+01	3.43E+01	3.24E+01	3.10E+01	3.02E+01	2.73E+01
0.30	3.49E+01	3.48E+01	3.36E+01	3.01E+01	2.79E+01	2.68E+01	2.31E+01
0.40	3.48E+01	3.47E+01	3.28E+01	2.77E+01	2.52E+01	2.38E+01	1.96E+01
0.50	3.47E+01	3.44E+01	3.18E+01	2.56E+01	2.27E+01	2.12E+01	1.65E+01
0.60	3.45E+01	3.42E+01	3.07E+01	2.36E+01	2.05E+01	1.88E+01	1.37E+01
0.70	3.44E+01	3.39E+01	2.96E+01	2.18E+01	1.85E+01	1.66E+01	1.14E+01
0.80	3.42E+01	3.36E+01	2.85E+01	2.02E+01	1.66E+01	1.46E+01	9.54E+00
1.00	3.36E+01	3.28E+01	2.64E+01	1.71E+01	1.32E+01	1.13E+01	6.92E+00
1.20	3.29E+01	3.20E+01	2.45E+01	1.44E+01	1.05E+01	8.83E+00	5.33E+00
1.50	3.17E+01	3.06E+01	2.20E+01	1.11E+01	7.65E+00	6.38E+00	3.91E+00
1.70	3.09E+01	2.97E+01	2.05E+01	9.38E+00	6.38E+00	5.32E+00	3.27E+00
2.00	2.97E+01	2.84E+01	1.83E+01	7.43E+00	5.06E+00	4.21E+00	2.53E+00
2.50	2.79E+01	2.63E+01	1.50E+01	5.37E+00	3.72E+00	3.04E+00	1.63E+00
3.00	2.64E+01	2.44E+01	1.23E+01	4.12E+00	2.83E+00	2.25E+00	1.03E+00
3.50	2.51E+01	2.27E+01	1.00E+01	3.29E+00	2.16E+00	1.65E+00	6.59E−01
4.00	2.39E+01	2.10E+01	8.31E+00	2.67E+00	1.64E+00	1.21E+00	4.38E−01
5.00	2.12E+01	1.81E+01	6.01E+00	1.76E+00	9.30E−01	6.51E−01	2.31E−01
6.00	1.82E+01	1.53E+01	4.64E+00	1.15E+00	5.40E−01	3.75E−01	1.49E−01
7.00	1.54E+01	1.30E+01	3.75E+00	7.58E−01	3.38E−01	2.38E−01	1.09E−01
8.00	1.29E+01	1.10E+01	3.08E+00	5.11E−01	2.32E−01	1.67E−01	8.33E−02
9.00	1.09E+01	9.34E+00	2.54E+00	3.58E−01	1.73E−01	1.28E−01	6.50E−02
10.00	9.36E+00	8.02E+00	2.10E+00	2.63E−01	1.37E−01	1.03E−01	5.09E−02
12.50	6.89E+00	5.78E+00	1.27E+00	1.46E−01	8.72E−02	6.51E−02	2.66E−02
15.00	5.58E+00	4.44E+00	7.67E−01	9.78E−02	5.90E−02	4.23E−02	1.32E−02
17.50	4.74E+00	3.55E+00	4.77E−01	7.09E−02	3.98E−02	2.68E−02	6.52E−03
20.00	4.06E+00	2.89E+00	3.16E−01	5.26E−02	2.63E−02	1.66E−02	3.26E−03
22.50	3.42E+00	2.36E+00	2.25E−01	3.90E−02	1.70E−02	1.01E−02	1.68E−03
25.00	2.82E+00	1.91E+00	1.70E−01	2.86E−02	1.09E−02	6.13E−03	8.93E−04
27.50	2.29E+00	1.55E+00	1.35E−01	2.07E−02	7.01E−03	3.74E−03	4.93E−04
30.00	1.83E+00	1.25E+00	1.11E−01	1.49E−02	4.51E−03	2.31E−03	2.82E−04
35.00	1.14E+00	8.04E−01	7.85E−02	7.54E−03	1.93E−03	9.25E−04	1.03E−04
40.00	7.18E−01	5.25E−01	5.74E−02	3.83E−03	8.69E−04	3.99E−04	4.35E−05
45.00	4.66E−01	3.53E−01	4.23E−02	1.99E−03	4.15E−04	1.86E−04	2.10E−05
50.00	3.19E−01	2.48E−01	3.11E−02	1.07E−03	2.11E−04	9.37E−05	1.14E−05
55.00	2.31E−01	1.82E−01	2.27E−02	5.94E−04	1.14E−04	5.08E−05	6.99E−06
60.00	1.76E−01	1.39E−01	1.65E−02	3.45E−04	6.53E−05	2.97E−05	4.71E−06
65.00	1.41E−01	1.11E−01	1.21E−02	2.10E−04	4.00E−05	1.86E−05	3.46E−06
70.00	1.17E−01	9.08E−02	8.93E−03	1.33E−04	2.61E−05	1.25E−05	2.74E−06
75.00	1.00E−01	7.67E−02	6.69E−03	8.92E−05	1.80E−05	9.00E−06	2.30E−06
80.00	8.82E−02	6.65E−02	5.11E−03	6.27E−05	1.33E−05	6.85E−06	2.03E−06
85.00	8.00E−02	5.92E−02	4.00E−03	4.63E−05	1.03E−05	5.53E−06	1.86E−06
90.00	7.43E−02	5.39E−02	3.22E−03	3.59E−05	8.45E−06	4.69E−06	1.78E−06
95.00	7.07E−02	5.03E−02	2.66E−03	2.91E−05	7.24E−06	4.15E−06	1.74E−06
105.00	6.76E−02	4.63E−02	1.96E−03	2.13E−05	5.93E−06	3.60E−06	1.78E−06
120.00	6.98E−02	4.55E−02	1.46E−03	1.64E−05	5.28E−06	3.43E−06	2.00E−06
135.00	7.55E−02	4.73E−02	1.23E−03	1.46E−05	5.26E−06	3.58E−06	2.33E−06
150.00	8.13E−02	4.96E−02	1.12E−03	1.39E−05	5.42E−06	3.81E−06	2.65E−06
165.00	8.55E−02	5.13E−02	1.06E−03	1.37E−05	5.59E−06	4.00E−06	2.88E−06
180.00	8.70E−02	5.19E−02	1.04E−03	1.36E−05	5.66E−06	4.07E−06	2.97E−06
total	6.62E+00	5.08E+00	9.85E−01	2.19E−01	1.31E−01	1.01E−01	5.11E−02
rel ff	6.72E+00	5.01E+00	9.94E−01	2.21E−01	1.32E−01	1.03E−01	5.17E−02
nrl ff	6.76E+00	5.05E+00	1.00E+00	2.23E−01	1.33E−01	1.04E−01	5.21E−02

TABLE 1. Predicted *S*-matrix differential elastic scattering cross sections for photon energies (50.0, 59.54, 145.4, 316.5, 411.8, 468.1, 661.6, 778.9, 964.0, 1004.8, 1112.1, 1274.5, 1408.0 and 1500.0). The angle integrated total cross sections for each element and energies are presented. ''total'' represents total cross sections from this work, ''rel ff'' represents total cross sections calculated from the relativistic form factor and ''nrl ff'' represents total cross sections calculated from the nonrelativistic form factor—Continued[a]

θ (deg)	Photon energy (keV)						
	778.9	964.0	1004.8	1112.1	1274.5	1408.0	1500.0
Scandium ($Z=21$)							
0.00	3.49E+01	3.49E+01	3.49E+01	3.49E+01	3.49E+01	3.49E+01	3.49E+01
0.01	3.49E+01	3.48E+01	3.48E+01	3.48E+01	3.48E+01	3.47E+01	3.47E+01
0.02	3.47E+01	3.46E+01	3.46E+01	3.45E+01	3.44E+01	3.43E+01	3.42E+01
0.04	3.42E+01	3.39E+01	3.38E+01	3.36E+01	3.32E+01	3.28E+01	3.26E+01
0.06	3.35E+01	3.28E+01	3.26E+01	3.22E+01	3.14E+01	3.08E+01	3.04E+01
0.10	3.14E+01	2.99E+01	2.96E+01	2.88E+01	2.76E+01	2.68E+01	2.62E+01
0.20	2.57E+01	2.34E+01	2.29E+01	2.17E+01	2.01E+01	1.88E+01	1.80E+01
0.30	2.12E+01	1.84E+01	1.79E+01	1.64E+01	1.43E+01	1.27E+01	1.16E+01
0.40	1.73E+01	1.42E+01	1.35E+01	1.20E+01	1.00E+01	8.68E+00	7.87E+00
0.50	1.40E+01	1.08E+01	1.02E+01	8.86E+00	7.28E+00	6.35E+00	5.87E+00
0.60	1.13E+01	8.37E+00	7.87E+00	6.76E+00	5.57E+00	4.97E+00	4.72E+00
0.70	9.17E+00	6.68E+00	6.26E+00	5.38E+00	4.47E+00	4.05E+00	3.90E+00
0.80	7.58E+00	5.51E+00	5.18E+00	4.46E+00	3.72E+00	3.34E+00	3.18E+00
1.00	5.49E+00	4.06E+00	3.83E+00	3.31E+00	2.68E+00	2.25E+00	1.98E+00
1.20	4.24E+00	3.15E+00	2.96E+00	2.53E+00	1.95E+00	1.50E+00	1.20E+00
1.50	3.07E+00	2.17E+00	2.02E+00	1.65E+00	1.16E+00	8.19E−01	6.14E−01
1.70	2.50E+00	1.68E+00	1.54E+00	1.21E+00	8.18E−01	5.64E−01	4.22E−01
2.00	1.84E+00	1.12E+00	1.01E+00	7.59E−01	4.96E−01	3.50E−01	2.75E−01
2.50	1.08E+00	5.81E−01	5.11E−01	3.73E−01	2.51E−01	2.01E−01	1.84E−01
3.00	6.45E−01	3.29E−01	2.89E−01	2.14E−01	1.56E−01	1.41E−01	1.46E−01
3.50	4.05E−01	2.13E−01	1.90E−01	1.46E−01	1.12E−01	1.04E−01	1.07E−01
4.00	2.75E−01	1.56E−01	1.41E−01	1.13E−01	8.76E−02	7.59E−02	7.05E−02
5.00	1.55E−01	1.01E−01	9.41E−02	7.82E−02	5.72E−02	4.02E−02	2.89E−02
6.00	1.05E−01	7.10E−02	6.59E−02	5.37E−02	3.59E−02	2.19E−02	1.37E−02
7.00	7.70E−02	4.98E−02	4.54E−02	3.50E−02	2.13E−02	1.20E−02	7.17E−03
8.00	5.78E−02	3.42E−02	3.04E−02	2.20E−02	1.23E−02	6.68E−03	3.99E−03
9.00	4.32E−02	2.29E−02	1.99E−02	1.35E−02	7.02E−03	3.78E−03	2.33E−03
10.00	3.20E−02	1.52E−02	1.28E−02	8.18E−03	4.03E−03	2.18E−03	1.40E−03
12.50	1.44E−02	5.33E−03	4.28E−03	2.44E−03	1.09E−03	5.98E−04	4.15E−04
15.00	6.30E−03	1.96E−03	1.53E−03	8.10E−04	3.38E−04	1.83E−04	1.29E−04
17.50	2.80E−03	7.79E−04	5.95E−04	3.02E−04	1.20E−04	6.33E−05	4.38E−05
20.00	1.30E−03	3.34E−04	2.53E−04	1.26E−04	4.87E−05	2.50E−05	1.69E−05
22.50	6.30E−04	1.55E−04	1.17E−04	5.77E−05	2.23E−05	1.14E−05	7.58E−06
25.00	3.22E−04	7.77E−05	5.85E−05	2.91E−05	1.15E−05	6.01E−06	4.04E−06
27.50	1.73E−04	4.18E−05	3.17E−05	1.61E−05	6.71E−06	3.65E−06	2.53E−06
30.00	9.78E−05	2.42E−05	1.85E−05	9.76E−06	4.35E−06	2.53E−06	1.84E−06
35.00	3.61E−05	9.78E−06	7.72E−06	4.46E−06	2.32E−06	1.53E−06	1.21E−06
40.00	1.60E−05	5.02E−06	4.12E−06	2.66E−06	1.64E−06	1.22E−06	1.02E−06
45.00	8.38E−06	3.15E−06	2.71E−06	1.96E−06	1.40E−06	1.12E−06	9.55E−07
50.00	5.04E−06	2.28E−06	2.04E−06	1.63E−06	1.28E−06	1.04E−06	8.50E−07
55.00	3.41E−06	1.85E−06	1.71E−06	1.48E−06	1.25E−06	9.95E−07	7.58E−07
60.00	2.55E−06	1.61E−06	1.54E−06	1.43E−06	1.26E−06	9.76E−07	6.99E−07
65.00	2.04E−06	1.46E−06	1.43E−06	1.39E−06	1.26E−06	9.44E−07	6.41E−07
70.00	1.75E−06	1.38E−06	1.37E−06	1.38E−06	1.27E−06	9.39E−07	6.16E−07
75.00	1.58E−06	1.35E−06	1.35E−06	1.39E−06	1.30E−06	9.50E−07	6.12E−07
80.00	1.47E−06	1.32E−06	1.34E−06	1.40E−06	1.32E−06	9.65E−07	6.21E−07
85.00	1.41E−06	1.32E−06	1.34E−06	1.41E−06	1.35E−06	9.93E−07	6.48E−07
90.00	1.39E−06	1.35E−06	1.38E−06	1.46E−06	1.40E−06	1.04E−06	6.92E−07
95.00	1.41E−06	1.39E−06	1.42E−06	1.51E−06	1.46E−06	1.10E−06	7.41E−07
105.00	1.50E−06	1.52E−06	1.55E−06	1.65E−06	1.60E−06	1.25E−06	8.83E−07
120.00	1.76E−06	1.81E−06	1.85E−06	1.95E−06	1.92E−06	1.56E−06	1.16E−06
135.00	2.10E−06	2.17E−06	2.22E−06	2.34E−06	2.30E−06	1.91E−06	1.47E−06
150.00	2.43E−06	2.52E−06	2.57E−06	2.69E−06	2.65E−06	2.24E−06	1.77E−06
165.00	2.67E−06	2.76E−06	2.82E−06	2.94E−06	2.91E−06	2.49E−06	1.99E−06
180.00	2.76E−06	2.85E−06	2.91E−06	3.04E−06	3.00E−06	2.58E−06	2.08E−06
total	3.68E−02	2.41E−02	2.22E−02	1.82E−02	1.38E−02	1.12E−02	9.82E−03
rel ff	3.74E−02	2.44E−02	2.25E−02	1.83E−02	1.39E−02	1.14E−02	1.01E−02
nrl ff	3.76E−02	2.46E−02	2.27E−02	1.85E−02	1.40E−02	1.15E−02	1.02E−02

TABLE 1. Predicted *S*-matrix differential elastic scattering cross sections for photon energies (50.0, 59.54, 145.4, 316.5, 411.8, 468.1, 661.6, 778.9, 964.0, 1004.8, 1112.1, 1274.5, 1408.0 and 1500.0). The angle integrated total cross sections for each element and energies are presented. ''total'' represents total cross sections from this work, ''rel ff'' represents total cross sections calculated from the relativistic form factor and ''nrl ff'' represents total cross sections calculated from the nonrelativistic form factor—Continued[a]

θ (deg)	Photon energy (keV)						
	50.0	59.5	145.4	316.5	411.8	468.1	661.6
Titanium ($Z=22$)							
0.00	3.85E+01	3.85E+01	3.83E+01	3.83E+01	3.83E+01	3.83E+01	3.83E+01
0.01	3.85E+01	3.85E+01	3.83E+01	3.83E+01	3.83E+01	3.83E+01	3.83E+01
0.02	3.85E+01	3.85E+01	3.83E+01	3.83E+01	3.82E+01	3.82E+01	3.82E+01
0.04	3.85E+01	3.85E+01	3.83E+01	3.82E+01	3.81E+01	3.81E+01	3.78E+01
0.06	3.85E+01	3.85E+01	3.83E+01	3.81E+01	3.79E+01	3.78E+01	3.73E+01
0.10	3.85E+01	3.85E+01	3.82E+01	3.76E+01	3.72E+01	3.69E+01	3.56E+01
0.20	3.85E+01	3.84E+01	3.77E+01	3.58E+01	3.45E+01	3.36E+01	3.07E+01
0.30	3.84E+01	3.83E+01	3.71E+01	3.35E+01	3.13E+01	3.01E+01	2.62E+01
0.40	3.83E+01	3.81E+01	3.62E+01	3.11E+01	2.83E+01	2.69E+01	2.23E+01
0.50	3.81E+01	3.79E+01	3.52E+01	2.88E+01	2.57E+01	2.40E+01	1.89E+01
0.60	3.80E+01	3.76E+01	3.41E+01	2.67E+01	2.33E+01	2.14E+01	1.58E+01
0.70	3.78E+01	3.73E+01	3.30E+01	2.48E+01	2.11E+01	1.90E+01	1.32E+01
0.80	3.76E+01	3.70E+01	3.19E+01	2.29E+01	1.90E+01	1.68E+01	1.11E+01
1.00	3.71E+01	3.63E+01	2.97E+01	1.96E+01	1.52E+01	1.31E+01	7.97E+00
1.20	3.64E+01	3.54E+01	2.77E+01	1.66E+01	1.21E+01	1.02E+01	6.02E+00
1.50	3.52E+01	3.41E+01	2.50E+01	1.28E+01	8.84E+00	7.31E+00	4.26E+00
1.70	3.44E+01	3.32E+01	2.33E+01	1.09E+01	7.31E+00	6.01E+00	3.50E+00
2.00	3.31E+01	3.18E+01	2.09E+01	8.57E+00	5.68E+00	4.65E+00	2.67E+00
2.50	3.12E+01	2.96E+01	1.73E+01	6.06E+00	4.02E+00	3.26E+00	1.76E+00
3.00	2.96E+01	2.75E+01	1.42E+01	4.55E+00	3.00E+00	2.38E+00	1.17E+00
3.50	2.82E+01	2.57E+01	1.16E+01	3.55E+00	2.29E+00	1.77E+00	7.80E−01
4.00	2.69E+01	2.39E+01	9.62E+00	2.84E+00	1.77E+00	1.33E+00	5.31E−01
5.00	2.40E+01	2.06E+01	6.86E+00	1.89E+00	1.07E+00	7.63E−01	2.77E−01
6.00	2.10E+01	1.76E+01	5.17E+00	1.28E+00	6.48E−01	4.53E−01	1.71E−01
7.00	1.80E+01	1.50E+01	4.06E+00	8.75E−01	4.11E−01	2.88E−01	1.19E−01
8.00	1.53E+01	1.27E+01	3.28E+00	6.08E−01	2.79E−01	1.97E−01	8.89E−02
9.00	1.30E+01	1.08E+01	2.69E+00	4.32E−01	2.02E−01	1.46E−01	6.95E−02
10.00	1.11E+01	9.29E+00	2.23E+00	3.17E−01	1.55E−01	1.13E−01	5.52E−02
12.50	7.95E+00	6.59E+00	1.41E+00	1.70E−01	9.33E−02	6.94E−02	3.06E−02
15.00	6.13E+00	4.93E+00	8.94E−01	1.08E−01	6.34E−02	4.59E−02	1.61E−02
17.50	4.99E+00	3.85E+00	5.76E−01	7.63E−02	4.41E−02	3.05E−02	8.20E−03
20.00	4.17E+00	3.08E+00	3.85E−01	5.65E−02	3.03E−02	1.97E−02	4.21E−03
22.50	3.50E+00	2.50E+00	2.71E−01	4.25E−02	2.03E−02	1.24E−02	2.21E−03
25.00	2.93E+00	2.04E+00	2.00E−01	3.20E−02	1.34E−02	7.73E−03	1.19E−03
27.50	2.44E+00	1.67E+00	1.54E−01	2.39E−02	8.76E−03	4.81E−03	6.64E−04
30.00	2.01E+00	1.37E+00	1.23E−01	1.76E−02	5.74E−03	3.01E−03	3.82E−04
35.00	1.34E+00	9.23E−01	8.44E−02	9.32E−03	2.52E−03	1.23E−03	1.40E−04
40.00	8.79E−01	6.24E−01	6.13E−02	4.89E−03	1.16E−03	5.38E−04	5.88E−05
45.00	5.84E−01	4.28E−01	4.57E−02	2.60E−03	5.58E−04	2.52E−04	2.80E−05
50.00	4.01E−01	3.02E−01	3.43E−02	1.41E−03	2.85E−04	1.27E−04	1.50E−05
55.00	2.87E−01	2.21E−01	2.57E−02	7.96E−04	1.54E−04	6.89E−05	8.93E−06
60.00	2.14E−01	1.66E−01	1.91E−02	4.65E−04	8.87E−05	4.00E−05	5.88E−06
65.00	1.66E−01	1.30E−01	1.43E−02	2.84E−04	5.41E−05	2.49E−05	4.22E−06
70.00	1.34E−01	1.05E−01	1.07E−02	1.81E−04	3.51E−05	1.66E−05	3.27E−06
75.00	1.12E−01	8.69E−02	8.17E−03	1.21E−04	2.41E−05	1.18E−05	2.70E−06
80.00	9.71E−02	7.42E−02	6.33E−03	8.52E−05	1.76E−05	8.87E−06	2.35E−06
85.00	8.64E−02	6.52E−02	5.01E−03	6.29E−05	1.36E−05	7.08E−06	2.14E−06
90.00	7.93E−02	5.88E−02	4.07E−03	4.86E−05	1.10E−05	5.94E−06	2.02E−06
95.00	7.46E−02	5.45E−02	3.39E−03	3.93E−05	9.37E−06	5.21E−06	1.97E−06
105.00	7.07E−02	4.99E−02	2.54E−03	2.86E−05	7.56E−06	4.44E−06	1.99E−06
120.00	7.29E−02	4.92E−02	1.92E−03	2.18E−05	6.59E−06	4.14E−06	2.22E−06
135.00	7.93E−02	5.15E−02	1.63E−03	1.92E−05	6.44E−06	4.25E−06	2.56E−06
150.00	8.62E−02	5.44E−02	1.49E−03	1.81E−05	6.57E−06	4.47E−06	2.91E−06
165.00	9.10E−02	5.66E−02	1.42E−03	1.77E−05	6.72E−06	4.66E−06	3.16E−06
180.00	9.28E−02	5.74E−02	1.39E−03	1.76E−05	6.78E−06	4.74E−06	3.25E−06
total	7.42E+00	5.72E+00	1.11E+00	2.47E−01	1.48E−01	1.14E−01	5.77E−02
rel ff	7.52E+00	5.61E+00	1.12E+00	2.50E−01	1.49E−01	1.16E−01	5.84E−02
nrl ff	7.57E+00	5.66E+00	1.13E+00	2.52E−01	1.51E−01	1.17E−01	5.89E−02

TABLE 1. Predicted *S*-matrix differential elastic scattering cross sections for photon energies (50.0, 59.54, 145.4, 316.5, 411.8, 468.1, 661.6, 778.9, 964.0, 1004.8, 1112.1, 1274.5, 1408.0 and 1500.0). The angle integrated total cross sections for each element and energies are presented. ''total'' represents total cross sections from this work, ''rel ff'' represents total cross sections calculated from the relativistic form factor and ''nrl ff'' represents total cross sections calculated from the nonrelativistic form factor—Continued[a]

θ (deg)	Photon energy (keV)						
	778.9	964.0	1004.8	1112.1	1274.5	1408.0	1500.0
Titanium ($Z=22$)							
0.00	3.83E+01	3.83E+01	3.83E+01	3.83E+01	3.83E+01	3.83E+01	3.83E+01
0.01	3.82E+01	3.82E+01	3.82E+01	3.82E+01	3.82E+01	3.81E+01	3.81E+01
0.02	3.81E+01	3.80E+01	3.80E+01	3.79E+01	3.78E+01	3.77E+01	3.76E+01
0.04	3.76E+01	3.73E+01	3.72E+01	3.70E+01	3.66E+01	3.63E+01	3.60E+01
0.06	3.69E+01	3.62E+01	3.60E+01	3.56E+01	3.49E+01	3.42E+01	3.38E+01
0.10	3.48E+01	3.33E+01	3.30E+01	3.22E+01	3.10E+01	3.01E+01	2.95E+01
0.20	2.90E+01	2.65E+01	2.60E+01	2.46E+01	2.28E+01	2.14E+01	2.06E+01
0.30	2.41E+01	2.10E+01	2.04E+01	1.88E+01	1.65E+01	1.47E+01	1.35E+01
0.40	1.98E+01	1.63E+01	1.56E+01	1.39E+01	1.16E+01	1.01E+01	9.12E+00
0.50	1.61E+01	1.25E+01	1.18E+01	1.03E+01	8.40E+00	7.25E+00	6.64E+00
0.60	1.31E+01	9.70E+00	9.11E+00	7.79E+00	6.33E+00	5.53E+00	5.16E+00
0.70	1.06E+01	7.68E+00	7.19E+00	6.10E+00	4.97E+00	4.39E+00	4.14E+00
0.80	8.74E+00	6.25E+00	5.84E+00	4.96E+00	4.03E+00	3.55E+00	3.34E+00
1.00	6.21E+00	4.44E+00	4.15E+00	3.53E+00	2.83E+00	2.40E+00	2.15E+00
1.20	4.67E+00	3.34E+00	3.13E+00	2.64E+00	2.06E+00	1.66E+00	1.40E+00
1.50	3.27E+00	2.29E+00	2.13E+00	1.76E+00	1.29E+00	9.66E−01	7.66E−01
1.70	2.65E+00	1.80E+00	1.66E+00	1.34E+00	9.45E−01	6.82E−01	5.26E−01
2.00	1.97E+00	1.26E+00	1.15E+00	8.92E−01	6.00E−01	4.22E−01	3.23E−01
2.50	1.22E+00	7.00E−01	6.23E−01	4.65E−01	3.09E−01	2.29E−01	1.90E−01
3.00	7.60E−01	4.05E−01	3.57E−01	2.64E−01	1.84E−01	1.51E−01	1.41E−01
3.50	4.90E−01	2.57E−01	2.27E−01	1.71E−01	1.25E−01	1.10E−01	1.08E−01
4.00	3.32E−01	1.80E−01	1.61E−01	1.24E−01	9.35E−02	8.17E−02	7.85E−02
5.00	1.79E−01	1.08E−01	9.89E−02	8.01E−02	6.01E−02	4.70E−02	3.86E−02
6.00	1.15E−01	7.46E−02	6.88E−02	5.61E−02	3.95E−02	2.67E−02	1.87E−02
7.00	8.26E−02	5.39E−02	4.95E−02	3.91E−02	2.50E−02	1.47E−02	9.05E−03
8.00	6.20E−02	3.88E−02	3.50E−02	2.63E−02	1.52E−02	8.15E−03	4.68E−03
9.00	4.73E−02	2.71E−02	2.39E−02	1.69E−02	9.00E−03	4.64E−03	2.66E−03
10.00	3.59E−02	1.85E−02	1.59E−02	1.05E−02	5.28E−03	2.73E−03	1.63E−03
12.50	1.73E−02	6.80E−03	5.53E−03	3.22E−03	1.46E−03	7.92E−04	5.36E−04
15.00	7.94E−03	2.57E−03	2.02E−03	1.08E−03	4.58E−04	2.51E−04	1.78E−04
17.50	3.64E−03	1.04E−03	7.98E−04	4.08E−04	1.64E−04	8.75E−05	6.14E−05
20.00	1.72E−03	4.52E−04	3.42E−04	1.71E−04	6.63E−05	3.43E−05	2.34E−05
22.50	8.46E−04	2.11E−04	1.59E−04	7.82E−05	3.01E−05	1.53E−05	1.02E−05
25.00	4.36E−04	1.06E−04	7.94E−05	3.92E−05	1.53E−05	7.84E−06	5.25E−06
27.50	2.35E−04	5.66E−05	4.27E−05	2.14E−05	8.65E−06	4.59E−06	3.13E−06
30.00	1.33E−04	3.24E−05	2.46E−05	1.27E−05	5.44E−06	3.05E−06	2.16E−06
35.00	4.88E−05	1.27E−05	9.92E−06	5.54E−06	2.71E−06	1.71E−06	1.30E−06
40.00	2.12E−05	6.26E−06	5.06E−06	3.13E−06	1.81E−06	1.29E−06	1.06E−06
45.00	1.08E−05	3.77E−06	3.18E−06	2.20E−06	1.49E−06	1.18E−06	1.01E−06
50.00	6.29E−06	2.62E−06	2.30E−06	1.76E−06	1.34E−06	1.10E−06	9.30E−07
55.00	4.14E−06	2.05E−06	1.87E−06	1.56E−06	1.30E−06	1.06E−06	8.55E−07
60.00	3.01E−06	1.75E−06	1.65E−06	1.48E−06	1.30E−06	1.05E−06	7.98E−07
65.00	2.36E−06	1.57E−06	1.52E−06	1.44E−06	1.31E−06	1.02E−06	7.29E−07
70.00	1.99E−06	1.48E−06	1.46E−06	1.44E−06	1.33E−06	1.01E−06	6.91E−07
75.00	1.77E−06	1.44E−06	1.44E−06	1.46E−06	1.37E−06	1.02E−06	6.76E−07
80.00	1.63E−06	1.42E−06	1.43E−06	1.48E−06	1.40E−06	1.04E−06	6.76E−07
85.00	1.56E−06	1.42E−06	1.44E−06	1.50E−06	1.44E−06	1.06E−06	6.96E−07
90.00	1.53E−06	1.45E−06	1.48E−06	1.56E−06	1.50E−06	1.12E−06	7.36E−07
95.00	1.54E−06	1.50E−06	1.53E−06	1.62E−06	1.57E−06	1.18E−06	7.82E−07
105.00	1.64E−06	1.64E−06	1.68E−06	1.78E−06	1.74E−06	1.34E−06	9.22E−07
120.00	1.92E−06	1.96E−06	2.00E−06	2.13E−06	2.09E−06	1.66E−06	1.20E−06
135.00	2.28E−06	2.36E−06	2.41E−06	2.55E−06	2.50E−06	2.03E−06	1.52E−06
150.00	2.63E−06	2.73E−06	2.79E−06	2.93E−06	2.88E−06	2.39E−06	1.83E−06
165.00	2.89E−06	2.99E−06	3.06E−06	3.21E−06	3.16E−06	2.65E−06	2.06E−06
180.00	2.98E−06	3.09E−06	3.16E−06	3.31E−06	3.26E−06	2.75E−06	2.15E−06
total	4.16E−02	2.72E−02	2.51E−02	2.05E−02	1.56E−02	1.27E−02	1.11E−02
rel ff	4.22E−02	2.76E−02	2.54E−02	2.07E−02	1.57E−02	1.29E−02	1.14E−02
nrl ff	4.26E−02	2.78E−02	2.56E−02	2.09E−02	1.59E−02	1.31E−02	1.15E−02

TABLE 1. Predicted *S*-matrix differential elastic scattering cross sections for photon energies (50.0, 59.54, 145.4, 316.5, 411.8, 468.1, 661.6, 778.9, 964.0, 1004.8, 1112.1, 1274.5, 1408.0 and 1500.0). The angle integrated total cross sections for each element and energies are presented. ''total'' represents total cross sections from this work, ''rel ff'' represents total cross sections calculated from the relativistic form factor and ''nrl ff'' represents total cross sections calculated from the nonrelativistic form factor—Continued[a]

θ (deg)	Photon energy (keV)						
	50.0	59.5	145.4	316.5	411.8	468.1	661.6
Vanadium ($Z=23$)							
0.00	4.21E+01	4.21E+01	4.19E+01	4.19E+01	4.19E+01	4.19E+01	4.19E+01
0.01	4.21E+01	4.21E+01	4.19E+01	4.18E+01	4.18E+01	4.18E+01	4.18E+01
0.02	4.21E+01	4.21E+01	4.19E+01	4.18E+01	4.18E+01	4.18E+01	4.17E+01
0.04	4.21E+01	4.21E+01	4.19E+01	4.17E+01	4.17E+01	4.16E+01	4.14E+01
0.06	4.21E+01	4.21E+01	4.18E+01	4.16E+01	4.14E+01	4.13E+01	4.08E+01
0.10	4.21E+01	4.20E+01	4.17E+01	4.12E+01	4.08E+01	4.05E+01	3.92E+01
0.20	4.21E+01	4.20E+01	4.13E+01	3.94E+01	3.81E+01	3.72E+01	3.41E+01
0.30	4.20E+01	4.19E+01	4.07E+01	3.71E+01	3.48E+01	3.35E+01	2.93E+01
0.40	4.19E+01	4.17E+01	3.98E+01	3.46E+01	3.17E+01	3.01E+01	2.52E+01
0.50	4.17E+01	4.15E+01	3.88E+01	3.22E+01	2.89E+01	2.70E+01	2.14E+01
0.60	4.16E+01	4.12E+01	3.77E+01	2.99E+01	2.63E+01	2.42E+01	1.80E+01
0.70	4.14E+01	4.10E+01	3.66E+01	2.78E+01	2.38E+01	2.16E+01	1.51E+01
0.80	4.12E+01	4.06E+01	3.54E+01	2.58E+01	2.15E+01	1.91E+01	1.27E+01
1.00	4.07E+01	3.99E+01	3.31E+01	2.21E+01	1.73E+01	1.49E+01	9.08E+00
1.20	4.01E+01	3.91E+01	3.10E+01	1.88E+01	1.39E+01	1.17E+01	6.76E+00
1.50	3.89E+01	3.77E+01	2.80E+01	1.47E+01	1.01E+01	8.30E+00	4.65E+00
1.70	3.81E+01	3.68E+01	2.62E+01	1.24E+01	8.30E+00	6.75E+00	3.75E+00
2.00	3.68E+01	3.54E+01	2.36E+01	9.78E+00	6.35E+00	5.12E+00	2.84E+00
2.50	3.48E+01	3.30E+01	1.96E+01	6.81E+00	4.36E+00	3.50E+00	1.91E+00
3.00	3.30E+01	3.08E+01	1.62E+01	5.00E+00	3.20E+00	2.54E+00	1.32E+00
3.50	3.15E+01	2.88E+01	1.33E+01	3.84E+00	2.45E+00	1.91E+00	9.10E−01
4.00	3.00E+01	2.69E+01	1.10E+01	3.04E+00	1.92E+00	1.47E+00	6.33E−01
5.00	2.70E+01	2.33E+01	7.77E+00	2.03E+00	1.21E+00	8.84E−01	3.28E−01
6.00	2.39E+01	2.00E+01	5.74E+00	1.42E+00	7.65E−01	5.40E−01	1.94E−01
7.00	2.08E+01	1.71E+01	4.42E+00	1.00E+00	4.92E−01	3.42E−01	1.30E−01
8.00	1.79E+01	1.46E+01	3.51E+00	7.12E−01	3.31E−01	2.31E−01	9.54E−02
9.00	1.53E+01	1.24E+01	2.86E+00	5.13E−01	2.34E−01	1.66E−01	7.46E−02
10.00	1.31E+01	1.06E+01	2.38E+00	3.77E−01	1.75E−01	1.26E−01	6.00E−02
12.50	9.09E+00	7.45E+00	1.55E+00	1.96E−01	1.00E−01	7.43E−02	3.49E−02
15.00	6.74E+00	5.47E+00	1.03E+00	1.20E−01	6.82E−02	5.00E−02	1.91E−02
17.50	5.29E+00	4.18E+00	6.83E−01	8.25E−02	4.88E−02	3.44E−02	1.01E−02
20.00	4.33E+00	3.30E+00	4.61E−01	6.09E−02	3.45E−02	2.30E−02	5.32E−03
22.50	3.63E+00	2.66E+00	3.21E−01	4.64E−02	2.38E−02	1.50E−02	2.84E−03
25.00	3.07E+00	2.18E+00	2.33E−01	3.57E−02	1.61E−02	9.54E−03	1.55E−03
27.50	2.61E+00	1.81E+00	1.76E−01	2.72E−02	1.07E−02	6.05E−03	8.75E−04
30.00	2.21E+00	1.51E+00	1.37E−01	2.05E−02	7.16E−03	3.85E−03	5.08E−04
35.00	1.55E+00	1.05E+00	9.13E−02	1.13E−02	3.22E−03	1.61E−03	1.87E−04
40.00	1.06E+00	7.30E−01	6.58E−02	6.11E−03	1.50E−03	7.11E−04	7.83E−05
45.00	7.16E−01	5.11E−01	4.95E−02	3.31E−03	7.36E−04	3.36E−04	3.68E−05
50.00	4.93E−01	3.63E−01	3.78E−02	1.83E−03	3.79E−04	1.70E−04	1.94E−05
55.00	3.50E−01	2.64E−01	2.88E−02	1.04E−03	2.06E−04	9.17E−05	1.13E−05
60.00	2.57E−01	1.97E−01	2.19E−02	6.15E−04	1.18E−04	5.30E−05	7.30E−06
65.00	1.95E−01	1.51E−01	1.67E−02	3.77E−04	7.20E−05	3.28E−05	5.13E−06
70.00	1.54E−01	1.20E−01	1.27E−02	2.42E−04	4.65E−05	2.16E−05	3.90E−06
75.00	1.26E−01	9.82E−02	9.82E−03	1.62E−04	3.18E−05	1.52E−05	3.18E−06
80.00	1.07E−01	8.28E−02	7.70E−03	1.14E−04	2.30E−05	1.14E−05	2.73E−06
85.00	9.41E−02	7.20E−02	6.16E−03	8.40E−05	1.77E−05	9.00E−06	2.46E−06
90.00	8.53E−02	6.45E−02	5.05E−03	6.48E−05	1.43E−05	7.49E−06	2.31E−06
95.00	7.96E−02	5.94E−02	4.24E−03	5.23E−05	1.20E−05	6.51E−06	2.23E−06
105.00	7.48E−02	5.41E−02	3.22E−03	3.79E−05	9.56E−06	5.47E−06	2.24E−06
120.00	7.69E−02	5.34E−02	2.46E−03	2.86E−05	8.19E−06	5.00E−06	2.47E−06
135.00	8.40E−02	5.62E−02	2.11E−03	2.50E−05	7.89E−06	5.05E−06	2.84E−06
150.00	9.17E−02	5.98E−02	1.94E−03	2.34E−05	7.95E−06	5.26E−06	3.20E−06
165.00	9.73E−02	6.24E−02	1.85E−03	2.28E−05	8.08E−06	5.45E−06	3.47E−06
180.00	9.93E−02	6.33E−02	1.82E−03	2.26E−05	8.13E−06	5.52E−06	3.56E−06
total	8.31E+00	6.41E+00	1.25E+00	2.78E−01	1.66E−01	1.29E−01	6.50E−02
rel ff	8.39E+00	6.26E+00	1.26E+00	2.81E−01	1.68E−01	1.31E−01	6.57E−02
nrl ff	8.45E+00	6.32E+00	1.27E+00	2.83E−01	1.70E−01	1.32E−01	6.63E−02

TABLE 1. Predicted *S*-matrix differential elastic scattering cross sections for photon energies (50.0, 59.54, 145.4, 316.5, 411.8, 468.1, 661.6, 778.9, 964.0, 1004.8, 1112.1, 1274.5, 1408.0 and 1500.0). The angle integrated total cross sections for each element and energies are presented. ''total'' represents total cross sections from this work, ''rel ff'' represents total cross sections calculated from the relativistic form factor and ''nrl ff'' represents total cross sections calculated from the nonrelativistic form factor—Continued[a]

θ (deg)	Photon energy (keV)						
	778.9	964.0	1004.8	1112.1	1274.5	1408.0	1500.0
Vanadium ($Z=23$)							
0.00	4.18E+01	4.18E+01	4.18E+01	4.18E+01	4.18E+01	4.18E+01	4.18E+01
0.01	4.18E+01	4.18E+01	4.18E+01	4.17E+01	4.17E+01	4.17E+01	4.16E+01
0.02	4.17E+01	4.16E+01	4.16E+01	4.15E+01	4.14E+01	4.13E+01	4.12E+01
0.04	4.12E+01	4.09E+01	4.08E+01	4.06E+01	4.02E+01	3.98E+01	3.96E+01
0.06	4.05E+01	3.98E+01	3.96E+01	3.92E+01	3.85E+01	3.78E+01	3.74E+01
0.10	3.84E+01	3.69E+01	3.66E+01	3.57E+01	3.45E+01	3.35E+01	3.29E+01
0.20	3.24E+01	2.97E+01	2.91E+01	2.77E+01	2.57E+01	2.42E+01	2.33E+01
0.30	2.71E+01	2.37E+01	2.30E+01	2.13E+01	1.87E+01	1.68E+01	1.55E+01
0.40	2.24E+01	1.86E+01	1.78E+01	1.59E+01	1.33E+01	1.15E+01	1.04E+01
0.50	1.84E+01	1.43E+01	1.36E+01	1.18E+01	9.60E+00	8.22E+00	7.46E+00
0.60	1.49E+01	1.11E+01	1.04E+01	8.90E+00	7.14E+00	6.14E+00	5.64E+00
0.70	1.22E+01	8.75E+00	8.17E+00	6.89E+00	5.50E+00	4.77E+00	4.43E+00
0.80	9.99E+00	7.05E+00	6.56E+00	5.51E+00	4.39E+00	3.80E+00	3.53E+00
1.00	6.99E+00	4.86E+00	4.52E+00	3.79E+00	3.01E+00	2.57E+00	2.34E+00
1.20	5.14E+00	3.57E+00	3.32E+00	2.79E+00	2.19E+00	1.83E+00	1.61E+00
1.50	3.51E+00	2.43E+00	2.26E+00	1.88E+00	1.43E+00	1.12E+00	9.34E−01
1.70	2.83E+00	1.94E+00	1.80E+00	1.48E+00	1.08E+00	8.09E−01	6.42E−01
2.00	2.12E+00	1.41E+00	1.30E+00	1.03E+00	7.14E−01	5.01E−01	3.77E−01
2.50	1.36E+00	8.28E−01	7.45E−01	5.66E−01	3.72E−01	2.59E−01	1.99E−01
3.00	8.83E−01	4.89E−01	4.33E−01	3.20E−01	2.14E−01	1.63E−01	1.41E−01
3.50	5.82E−01	3.06E−01	2.69E−01	1.98E−01	1.39E−01	1.16E−01	1.10E−01
4.00	3.95E−01	2.07E−01	1.83E−01	1.37E−01	1.00E−01	8.81E−02	8.67E−02
5.00	2.06E−01	1.16E−01	1.05E−01	8.32E−02	6.36E−02	5.42E−02	4.96E−02
6.00	1.27E−01	7.89E−02	7.25E−02	5.90E−02	4.33E−02	3.20E−02	2.46E−02
7.00	8.91E−02	5.84E−02	5.39E−02	4.34E−02	2.89E−02	1.77E−02	1.12E−02
8.00	6.69E−02	4.36E−02	3.98E−02	3.08E−02	1.84E−02	9.82E−03	5.49E−03
9.00	5.17E−02	3.15E−02	2.83E−02	2.06E−02	1.12E−02	5.64E−03	3.06E−03
10.00	4.02E−02	2.21E−02	1.93E−02	1.32E−02	6.75E−03	3.37E−03	1.90E−03
12.50	2.04E−02	8.50E−03	6.98E−03	4.16E−03	1.91E−03	1.03E−03	6.80E−04
15.00	9.80E−03	3.31E−03	2.61E−03	1.42E−03	6.09E−04	3.36E−04	2.40E−04
17.50	4.63E−03	1.36E−03	1.05E−03	5.42E−04	2.20E−04	1.18E−04	8.39E−05
20.00	2.23E−03	6.00E−04	4.55E−04	2.28E−04	8.88E−05	4.63E−05	3.18E−05
22.50	1.11E−03	2.82E−04	2.12E−04	1.04E−04	4.00E−05	2.03E−05	1.36E−05
25.00	5.79E−04	1.41E−04	1.06E−04	5.20E−05	2.00E−05	1.02E−05	6.76E−06
27.50	3.14E−04	7.54E−05	5.67E−05	2.81E−05	1.11E−05	5.75E−06	3.86E−06
30.00	1.78E−04	4.28E−05	3.24E−05	1.64E−05	6.78E−06	3.68E−06	2.55E−06
35.00	6.48E−05	1.64E−05	1.26E−05	6.85E−06	3.19E−06	1.92E−06	1.42E−06
40.00	2.77E−05	7.78E−06	6.21E−06	3.70E−06	2.02E−06	1.39E−06	1.12E−06
45.00	1.38E−05	4.50E−06	3.74E−06	2.49E−06	1.61E−06	1.25E−06	1.08E−06
50.00	7.82E−06	3.02E−06	2.60E−06	1.92E−06	1.41E−06	1.17E−06	1.01E−06
55.00	5.01E−06	2.30E−06	2.06E−06	1.67E−06	1.35E−06	1.14E−06	9.56E−07
60.00	3.56E−06	1.92E−06	1.79E−06	1.56E−06	1.36E−06	1.13E−06	9.03E−07
65.00	2.74E−06	1.71E−06	1.63E−06	1.51E−06	1.36E−06	1.10E−06	8.24E−07
70.00	2.27E−06	1.59E−06	1.55E−06	1.51E−06	1.40E−06	1.09E−06	7.73E−07
75.00	1.99E−06	1.55E−06	1.53E−06	1.54E−06	1.45E−06	1.10E−06	7.47E−07
80.00	1.82E−06	1.52E−06	1.52E−06	1.56E−06	1.49E−06	1.11E−06	7.37E−07
85.00	1.73E−06	1.52E−06	1.54E−06	1.60E−06	1.53E−06	1.14E−06	7.51E−07
90.00	1.70E−06	1.56E−06	1.59E−06	1.67E−06	1.61E−06	1.20E−06	7.87E−07
95.00	1.70E−06	1.61E−06	1.65E−06	1.74E−06	1.68E−06	1.26E−06	8.30E−07
105.00	1.80E−06	1.77E−06	1.82E−06	1.93E−06	1.88E−06	1.43E−06	9.70E−07
120.00	2.09E−06	2.12E−06	2.17E−06	2.31E−06	2.26E−06	1.78E−06	1.26E−06
135.00	2.48E−06	2.56E−06	2.62E−06	2.77E−06	2.72E−06	2.17E−06	1.58E−06
150.00	2.86E−06	2.95E−06	3.02E−06	3.19E−06	3.13E−06	2.55E−06	1.90E−06
165.00	3.13E−06	3.24E−06	3.32E−06	3.49E−06	3.43E−06	2.82E−06	2.14E−06
180.00	3.23E−06	3.35E−06	3.42E−06	3.60E−06	3.54E−06	2.93E−06	2.23E−06
total	4.68E−02	3.07E−02	2.83E−02	2.31E−02	1.75E−02	1.43E−02	1.25E−02
rel ff	4.75E−02	3.10E−02	2.86E−02	2.33E−02	1.77E−02	1.45E−02	1.28E−02
nrl ff	4.80E−02	3.13E−02	2.89E−02	2.35E−02	1.79E−02	1.47E−02	1.30E−02

TABLE 1. Predicted *S*-matrix differential elastic scattering cross sections for photon energies (50.0, 59.54, 145.4, 316.5, 411.8, 468.1, 661.6, 778.9, 964.0, 1004.8, 1112.1, 1274.5, 1408.0 and 1500.0). The angle integrated total cross sections for each element and energies are presented. ''total'' represents total cross sections from this work, ''rel ff'' represents total cross sections calculated from the relativistic form factor and ''nrl ff'' represents total cross sections calculated from the nonrelativistic form factor—Continued[a]

θ (deg)	Photon energy (keV)						
	50.0	59.5	145.4	316.5	411.8	468.1	661.6
Chromium ($Z=24$)							
0.00	4.59E+01	4.58E+01	4.56E+01	4.56E+01	4.56E+01	4.56E+01	4.56E+01
0.01	4.59E+01	4.58E+01	4.56E+01	4.55E+01	4.55E+01	4.55E+01	4.55E+01
0.02	4.59E+01	4.58E+01	4.56E+01	4.55E+01	4.55E+01	4.55E+01	4.54E+01
0.04	4.59E+01	4.58E+01	4.56E+01	4.55E+01	4.54E+01	4.53E+01	4.51E+01
0.06	4.59E+01	4.58E+01	4.55E+01	4.53E+01	4.52E+01	4.51E+01	4.46E+01
0.10	4.58E+01	4.58E+01	4.55E+01	4.49E+01	4.45E+01	4.42E+01	4.30E+01
0.20	4.58E+01	4.57E+01	4.50E+01	4.32E+01	4.18E+01	4.09E+01	3.78E+01
0.30	4.58E+01	4.56E+01	4.44E+01	4.08E+01	3.85E+01	3.71E+01	3.27E+01
0.40	4.56E+01	4.55E+01	4.35E+01	3.82E+01	3.52E+01	3.35E+01	2.81E+01
0.50	4.55E+01	4.52E+01	4.25E+01	3.57E+01	3.21E+01	3.02E+01	2.40E+01
0.60	4.53E+01	4.50E+01	4.14E+01	3.33E+01	2.93E+01	2.71E+01	2.03E+01
0.70	4.52E+01	4.47E+01	4.03E+01	3.10E+01	2.66E+01	2.42E+01	1.71E+01
0.80	4.50E+01	4.44E+01	3.91E+01	2.89E+01	2.41E+01	2.15E+01	1.44E+01
1.00	4.45E+01	4.37E+01	3.67E+01	2.48E+01	1.96E+01	1.69E+01	1.03E+01
1.20	4.39E+01	4.29E+01	3.44E+01	2.12E+01	1.58E+01	1.33E+01	7.55E+00
1.50	4.27E+01	4.15E+01	3.13E+01	1.66E+01	1.15E+01	9.35E+00	5.07E+00
1.70	4.19E+01	4.05E+01	2.93E+01	1.41E+01	9.36E+00	7.55E+00	4.05E+00
2.00	4.06E+01	3.91E+01	2.64E+01	1.11E+01	7.08E+00	5.65E+00	3.04E+00
2.50	3.85E+01	3.66E+01	2.21E+01	7.62E+00	4.74E+00	3.77E+00	2.07E+00
3.00	3.66E+01	3.43E+01	1.83E+01	5.51E+00	3.42E+00	2.72E+00	1.47E+00
3.50	3.49E+01	3.21E+01	1.51E+01	4.16E+00	2.62E+00	2.07E+00	1.05E+00
4.00	3.33E+01	3.00E+01	1.25E+01	3.27E+00	2.08E+00	1.62E+00	7.42E−01
5.00	3.01E+01	2.61E+01	8.74E+00	2.19E+00	1.36E+00	1.01E+00	3.84E−01
6.00	2.69E+01	2.26E+01	6.35E+00	1.56E+00	8.90E−01	6.33E−01	2.20E−01
7.00	2.37E+01	1.93E+01	4.81E+00	1.13E+00	5.80E−01	4.02E−01	1.42E−01
8.00	2.06E+01	1.65E+01	3.77E+00	8.24E−01	3.87E−01	2.67E−01	1.03E−01
9.00	1.77E+01	1.41E+01	3.06E+00	6.01E−01	2.69E−01	1.88E−01	8.04E−02
10.00	1.51E+01	1.21E+01	2.55E+00	4.42E−01	1.96E−01	1.39E−01	6.52E−02
12.50	1.03E+01	8.38E+00	1.71E+00	2.25E−01	1.09E−01	8.00E−02	3.95E−02
15.00	7.41E+00	6.05E+00	1.17E+00	1.33E−01	7.37E−02	5.43E−02	2.25E−02
17.50	5.65E+00	4.55E+00	7.98E−01	8.96E−02	5.37E−02	3.85E−02	1.22E−02
20.00	4.54E+00	3.54E+00	5.43E−01	6.58E−02	3.89E−02	2.66E−02	6.60E−03
22.50	3.79E+00	2.85E+00	3.77E−01	5.07E−02	2.75E−02	1.77E−02	3.59E−03
25.00	3.24E+00	2.35E+00	2.70E−01	3.96E−02	1.90E−02	1.16E−02	1.99E−03
27.50	2.80E+00	1.96E+00	2.00E−01	3.08E−02	1.29E−02	7.46E−03	1.13E−03
30.00	2.41E+00	1.65E+00	1.53E−01	2.37E−02	8.76E−03	4.82E−03	6.62E−04
35.00	1.76E+00	1.19E+00	9.93E−02	1.35E−02	4.05E−03	2.06E−03	2.46E−04
40.00	1.24E+00	8.45E−01	7.10E−02	7.49E−03	1.92E−03	9.23E−04	1.03E−04
45.00	8.60E−01	6.00E−01	5.37E−02	4.15E−03	9.52E−04	4.40E−04	4.79E−05
50.00	5.96E−01	4.29E−01	4.15E−02	2.33E−03	4.94E−04	2.23E−04	2.48E−05
55.00	4.20E−01	3.11E−01	3.22E−02	1.34E−03	2.70E−04	1.20E−04	1.43E−05
60.00	3.04E−01	2.30E−01	2.49E−02	7.97E−04	1.55E−04	6.93E−05	9.04E−06
65.00	2.28E−01	1.75E−01	1.92E−02	4.92E−04	9.44E−05	4.26E−05	6.24E−06
70.00	1.77E−01	1.37E−01	1.49E−02	3.16E−04	6.08E−05	2.80E−05	4.66E−06
75.00	1.42E−01	1.11E−01	1.16E−02	2.13E−04	4.14E−05	1.95E−05	3.74E−06
80.00	1.19E−01	9.25E−02	9.21E−03	1.50E−04	2.99E−05	1.45E−05	3.18E−06
85.00	1.03E−01	7.97E−02	7.44E−03	1.10E−04	2.28E−05	1.14E−05	2.84E−06
90.00	9.25E−02	7.09E−02	6.15E−03	8.52E−05	1.83E−05	9.39E−06	2.64E−06
95.00	8.57E−02	6.50E−02	5.21E−03	6.86E−05	1.53E−05	8.11E−06	2.54E−06
105.00	7.97E−02	5.90E−02	4.00E−03	4.96E−05	1.20E−05	6.72E−06	2.52E−06
120.00	8.17E−02	5.81E−02	3.10E−03	3.72E−05	1.01E−05	6.04E−06	2.76E−06
135.00	8.95E−02	6.15E−02	2.69E−03	3.22E−05	9.63E−06	6.01E−06	3.15E−06
150.00	9.81E−02	6.57E−02	2.48E−03	3.00E−05	9.61E−06	6.20E−06	3.54E−06
165.00	1.04E−01	6.87E−02	2.38E−03	2.91E−05	9.70E−06	6.38E−06	3.82E−06
180.00	1.07E−01	6.99E−02	2.34E−03	2.88E−05	9.75E−06	6.45E−06	3.92E−06
total	9.27E+00	7.16E+00	1.40E+00	3.11E−01	1.87E−01	1.44E−01	7.29E−02
rel ff	9.35E+00	6.98E+00	1.41E+00	3.15E−01	1.88E−01	1.46E−01	7.37E−02
nrl ff	9.43E+00	7.04E+00	1.42E+00	3.18E−01	1.90E−01	1.48E−01	7.44E−02

TABLE 1. Predicted *S*-matrix differential elastic scattering cross sections for photon energies (50.0, 59.54, 145.4, 316.5, 411.8, 468.1, 661.6, 778.9, 964.0, 1004.8, 1112.1, 1274.5, 1408.0 and 1500.0). The angle integrated total cross sections for each element and energies are presented. ''total'' represents total cross sections from this work, ''rel ff'' represents total cross sections calculated from the relativistic form factor and ''nrl ff'' represents total cross sections calculated from the nonrelativistic form factor—Continued[a]

θ (deg)	Photon energy (keV)						
	778.9	964.0	1004.8	1112.1	1274.5	1408.0	1500.0
Chromium ($Z=24$)							
0.00	4.56E+01	4.55E+01	4.55E+01	4.55E+01	4.55E+01	4.55E+01	4.55E+01
0.01	4.55E+01	4.55E+01	4.55E+01	4.54E+01	4.54E+01	4.54E+01	4.53E+01
0.02	4.54E+01	4.53E+01	4.53E+01	4.52E+01	4.51E+01	4.50E+01	4.49E+01
0.04	4.49E+01	4.46E+01	4.45E+01	4.43E+01	4.39E+01	4.36E+01	4.33E+01
0.06	4.42E+01	4.35E+01	4.33E+01	4.29E+01	4.22E+01	4.16E+01	4.12E+01
0.10	4.21E+01	4.06E+01	4.03E+01	3.94E+01	3.81E+01	3.71E+01	3.64E+01
0.20	3.59E+01	3.30E+01	3.24E+01	3.09E+01	2.87E+01	2.71E+01	2.61E+01
0.30	3.02E+01	2.66E+01	2.58E+01	2.39E+01	2.11E+01	1.90E+01	1.75E+01
0.40	2.52E+01	2.09E+01	2.01E+01	1.80E+01	1.51E+01	1.31E+01	1.19E+01
0.50	2.07E+01	1.63E+01	1.54E+01	1.34E+01	1.09E+01	9.26E+00	8.35E+00
0.60	1.69E+01	1.26E+01	1.18E+01	1.01E+01	8.02E+00	6.80E+00	6.17E+00
0.70	1.38E+01	9.90E+00	9.22E+00	7.73E+00	6.09E+00	5.19E+00	4.75E+00
0.80	1.13E+01	7.90E+00	7.33E+00	6.10E+00	4.78E+00	4.08E+00	3.75E+00
1.00	7.82E+00	5.31E+00	4.92E+00	4.08E+00	3.21E+00	2.76E+00	2.54E+00
1.20	5.65E+00	3.83E+00	3.55E+00	2.96E+00	2.34E+00	2.01E+00	1.84E+00
1.50	3.78E+00	2.59E+00	2.41E+00	2.02E+00	1.58E+00	1.29E+00	1.11E+00
1.70	3.03E+00	2.10E+00	1.95E+00	1.62E+00	1.23E+00	9.45E−01	7.68E−01
2.00	2.28E+00	1.57E+00	1.45E+00	1.18E+00	8.36E−01	5.87E−01	4.36E−01
2.50	1.51E+00	9.64E−01	8.76E−01	6.77E−01	4.42E−01	2.94E−01	2.12E−01
3.00	1.01E+00	5.81E−01	5.16E−01	3.82E−01	2.48E−01	1.77E−01	1.43E−01
3.50	6.81E−01	3.59E−01	3.15E−01	2.29E−01	1.55E−01	1.24E−01	1.14E−01
4.00	4.63E−01	2.36E−01	2.07E−01	1.52E−01	1.09E−01	9.52E−02	9.51E−02
5.00	2.35E−01	1.26E−01	1.12E−01	8.74E−02	6.77E−02	6.17E−02	6.16E−02
6.00	1.41E−01	8.41E−02	7.69E−02	6.24E−02	4.74E−02	3.76E−02	3.13E−02
7.00	9.65E−02	6.33E−02	5.86E−02	4.79E−02	3.30E−02	2.10E−02	1.37E−02
8.00	7.23E−02	4.86E−02	4.48E−02	3.56E−02	2.18E−02	1.17E−02	6.45E−03
9.00	5.65E−02	3.62E−02	3.28E−02	2.47E−02	1.38E−02	6.78E−03	3.54E−03
10.00	4.47E−02	2.60E−02	2.30E−02	1.62E−02	8.43E−03	4.12E−03	2.22E−03
12.50	2.38E−02	1.04E−02	8.65E−03	5.27E−03	2.46E−03	1.31E−03	8.50E−04
15.00	1.19E−02	4.17E−03	3.31E−03	1.83E−03	7.96E−04	4.41E−04	3.14E−04
17.50	5.77E−03	1.75E−03	1.36E−03	7.06E−04	2.90E−04	1.57E−04	1.12E−04
20.00	2.84E−03	7.81E−04	5.94E−04	2.99E−04	1.17E−04	6.14E−05	4.25E−05
22.50	1.44E−03	3.70E−04	2.79E−04	1.37E−04	5.25E−05	2.67E−05	1.79E−05
25.00	7.55E−04	1.86E−04	1.39E−04	6.81E−05	2.59E−05	1.30E−05	8.64E−06
27.50	4.12E−04	9.90E−05	7.42E−05	3.65E−05	1.41E−05	7.18E−06	4.77E−06
30.00	2.34E−04	5.59E−05	4.21E−05	2.10E−05	8.43E−06	4.45E−06	3.02E−06
35.00	8.49E−05	2.09E−05	1.60E−05	8.46E−06	3.76E−06	2.18E−06	1.57E−06
40.00	3.58E−05	9.64E−06	7.60E−06	4.38E−06	2.28E−06	1.51E−06	1.19E−06
45.00	1.75E−05	5.39E−06	4.41E−06	2.83E−06	1.75E−06	1.34E−06	1.15E−06
50.00	9.69E−06	3.49E−06	2.97E−06	2.11E−06	1.50E−06	1.24E−06	1.10E−06
55.00	6.06E−06	2.59E−06	2.29E−06	1.79E−06	1.42E−06	1.22E−06	1.06E−06
60.00	4.21E−06	2.12E−06	1.95E−06	1.65E−06	1.42E−06	1.22E−06	1.01E−06
65.00	3.19E−06	1.86E−06	1.75E−06	1.59E−06	1.43E−06	1.18E−06	9.26E−07
70.00	2.60E−06	1.73E−06	1.67E−06	1.59E−06	1.47E−06	1.18E−06	8.62E−07
75.00	2.26E−06	1.67E−06	1.64E−06	1.62E−06	1.53E−06	1.19E−06	8.25E−07
80.00	2.05E−06	1.64E−06	1.63E−06	1.66E−06	1.58E−06	1.20E−06	8.06E−07
85.00	1.93E−06	1.64E−06	1.65E−06	1.71E−06	1.64E−06	1.23E−06	8.13E−07
90.00	1.88E−06	1.69E−06	1.71E−06	1.79E−06	1.72E−06	1.29E−06	8.45E−07
95.00	1.88E−06	1.75E−06	1.78E−06	1.87E−06	1.81E−06	1.35E−06	8.87E−07
105.00	1.98E−06	1.92E−06	1.97E−06	2.09E−06	2.03E−06	1.53E−06	1.03E−06
120.00	2.29E−06	2.30E−06	2.36E−06	2.51E−06	2.45E−06	1.90E−06	1.32E−06
135.00	2.71E−06	2.77E−06	2.84E−06	3.01E−06	2.94E−06	2.32E−06	1.65E−06
150.00	3.11E−06	3.20E−06	3.28E−06	3.47E−06	3.39E−06	2.71E−06	1.98E−06
165.00	3.40E−06	3.51E−06	3.59E−06	3.79E−06	3.71E−06	3.01E−06	2.23E−06
180.00	3.50E−06	3.62E−06	3.70E−06	3.91E−06	3.84E−06	3.12E−06	2.33E−06
total	5.25E−02	3.44E−02	3.17E−02	2.59E−02	1.97E−02	1.60E−02	1.41E−02
rel ff	5.33E−02	3.48E−02	3.21E−02	2.61E−02	1.99E−02	1.63E−02	1.44E−02
nrl ff	5.38E−02	3.52E−02	3.24E−02	2.64E−02	2.01E−02	1.65E−02	1.46E−02

TABLE 1. Predicted *S*-matrix differential elastic scattering cross sections for photon energies (50.0, 59.54, 145.4, 316.5, 411.8, 468.1, 661.6, 778.9, 964.0, 1004.8, 1112.1, 1274.5, 1408.0 and 1500.0). The angle integrated total cross sections for each element and energies are presented. ''total'' represents total cross sections from this work, ''rel ff'' represents total cross sections calculated from the relativistic form factor and ''nrl ff'' represents total cross sections calculated from the nonrelativistic form factor—Continued[a]

θ (deg)	Photon energy (keV)						
	50.0	59.5	145.4	316.5	411.8	468.1	661.6
Manganese ($Z=25$)							
0.00	4.98E+01	4.98E+01	4.95E+01	4.94E+01	4.94E+01	4.94E+01	4.94E+01
0.01	4.98E+01	4.98E+01	4.95E+01	4.94E+01	4.94E+01	4.94E+01	4.94E+01
0.02	4.98E+01	4.98E+01	4.95E+01	4.94E+01	4.94E+01	4.93E+01	4.93E+01
0.04	4.98E+01	4.97E+01	4.94E+01	4.93E+01	4.92E+01	4.92E+01	4.90E+01
0.06	4.98E+01	4.97E+01	4.94E+01	4.92E+01	4.90E+01	4.89E+01	4.84E+01
0.10	4.98E+01	4.97E+01	4.93E+01	4.88E+01	4.84E+01	4.81E+01	4.69E+01
0.20	4.97E+01	4.97E+01	4.89E+01	4.71E+01	4.57E+01	4.48E+01	4.15E+01
0.30	4.97E+01	4.96E+01	4.83E+01	4.47E+01	4.23E+01	4.08E+01	3.61E+01
0.40	4.96E+01	4.94E+01	4.74E+01	4.20E+01	3.88E+01	3.70E+01	3.12E+01
0.50	4.94E+01	4.92E+01	4.64E+01	3.94E+01	3.55E+01	3.34E+01	2.68E+01
0.60	4.93E+01	4.89E+01	4.53E+01	3.68E+01	3.25E+01	3.01E+01	2.27E+01
0.70	4.91E+01	4.87E+01	4.41E+01	3.43E+01	2.96E+01	2.69E+01	1.92E+01
0.80	4.89E+01	4.83E+01	4.29E+01	3.20E+01	2.69E+01	2.41E+01	1.62E+01
1.00	4.84E+01	4.76E+01	4.04E+01	2.77E+01	2.19E+01	1.90E+01	1.15E+01
1.20	4.78E+01	4.68E+01	3.80E+01	2.37E+01	1.77E+01	1.49E+01	8.40E+00
1.50	4.67E+01	4.54E+01	3.46E+01	1.86E+01	1.29E+01	1.05E+01	5.54E+00
1.70	4.59E+01	4.44E+01	3.25E+01	1.58E+01	1.05E+01	8.40E+00	4.37E+00
2.00	4.46E+01	4.29E+01	2.94E+01	1.24E+01	7.85E+00	6.21E+00	3.26E+00
2.50	4.24E+01	4.04E+01	2.47E+01	8.48E+00	5.16E+00	4.08E+00	2.24E+00
3.00	4.03E+01	3.79E+01	2.05E+01	6.05E+00	3.68E+00	2.93E+00	1.64E+00
3.50	3.84E+01	3.55E+01	1.70E+01	4.52E+00	2.81E+00	2.24E+00	1.19E+00
4.00	3.67E+01	3.33E+01	1.41E+01	3.53E+00	2.26E+00	1.77E+00	8.59E−01
5.00	3.34E+01	2.91E+01	9.78E+00	2.37E+00	1.53E+00	1.15E+00	4.44E−01
6.00	3.01E+01	2.52E+01	7.02E+00	1.72E+00	1.02E+00	7.32E−01	2.48E−01
7.00	2.67E+01	2.17E+01	5.24E+00	1.27E+00	6.75E−01	4.67E−01	1.57E−01
8.00	2.34E+01	1.86E+01	4.07E+00	9.43E−01	4.49E−01	3.07E−01	1.12E−01
9.00	2.01E+01	1.59E+01	3.29E+00	6.95E−01	3.08E−01	2.12E−01	8.69E−02
10.00	1.72E+01	1.36E+01	2.74E+00	5.12E−01	2.21E−01	1.54E−01	7.09E−02
12.50	1.16E+01	9.37E+00	1.88E+00	2.56E−01	1.18E−01	8.66E−02	4.43E−02
15.00	8.15E+00	6.68E+00	1.32E+00	1.48E−01	7.98E−02	5.91E−02	2.60E−02
17.50	6.07E+00	4.95E+00	9.20E−01	9.76E−02	5.89E−02	4.28E−02	1.46E−02
20.00	4.81E+00	3.83E+00	6.32E−01	7.14E−02	4.36E−02	3.03E−02	8.04E−03
22.50	4.00E+00	3.07E+00	4.38E−01	5.53E−02	3.14E−02	2.07E−02	4.45E−03
25.00	3.44E+00	2.53E+00	3.10E−01	4.38E−02	2.21E−02	1.38E−02	2.51E−03
27.50	3.00E+00	2.13E+00	2.26E−01	3.46E−02	1.53E−02	9.05E−03	1.44E−03
30.00	2.63E+00	1.81E+00	1.71E−01	2.70E−02	1.06E−02	5.92E−03	8.49E−04
35.00	1.99E+00	1.33E+00	1.08E−01	1.59E−02	4.99E−03	2.58E−03	3.18E−04
40.00	1.44E+00	9.66E−01	7.70E−02	9.03E−03	2.42E−03	1.18E−03	1.33E−04
45.00	1.02E+00	6.95E−01	5.84E−02	5.10E−03	1.21E−03	5.66E−04	6.16E−05
50.00	7.07E−01	5.00E−01	4.56E−02	2.91E−03	6.35E−04	2.88E−04	3.16E−05
55.00	4.97E−01	3.62E−01	3.57E−02	1.69E−03	3.48E−04	1.56E−04	1.79E−05
60.00	3.57E−01	2.67E−01	2.80E−02	1.02E−03	2.01E−04	8.96E−05	1.11E−05
65.00	2.64E−01	2.01E−01	2.19E−02	6.31E−04	1.22E−04	5.48E−05	7.57E−06
70.00	2.02E−01	1.56E−01	1.71E−02	4.08E−04	7.85E−05	3.58E−05	5.58E−06
75.00	1.61E−01	1.25E−01	1.35E−02	2.75E−04	5.34E−05	2.48E−05	4.42E−06
80.00	1.33E−01	1.03E−01	1.09E−02	1.94E−04	3.83E−05	1.83E−05	3.71E−06
85.00	1.14E−01	8.84E−02	8.86E−03	1.43E−04	2.91E−05	1.43E−05	3.28E−06
90.00	1.01E−01	7.82E−02	7.38E−03	1.11E−04	2.32E−05	1.17E−05	3.04E−06
95.00	9.30E−02	7.14E−02	6.30E−03	8.89E−05	1.94E−05	1.00E−05	2.90E−06
105.00	8.57E−02	6.45E−02	4.90E−03	6.41E−05	1.51E−05	8.23E−06	2.86E−06
120.00	8.75E−02	6.35E−02	3.85E−03	4.78E−05	1.25E−05	7.28E−06	3.10E−06
135.00	9.59E−02	6.74E−02	3.37E−03	4.11E−05	1.17E−05	7.16E−06	3.50E−06
150.00	1.05E−01	7.21E−02	3.12E−03	3.81E−05	1.16E−05	7.31E−06	3.92E−06
165.00	1.12E−01	7.57E−02	3.00E−03	3.68E−05	1.17E−05	7.48E−06	4.22E−06
180.00	1.15E−01	7.70E−02	2.96E−03	3.64E−05	1.17E−05	7.55E−06	4.33E−06
total	1.03E+01	7.97E+00	1.56E+00	3.47E−01	2.08E−01	1.61E−01	8.14E−02
rel ff	1.03E+01	7.73E+00	1.56E+00	3.50E−01	2.10E−01	1.63E−01	8.21E−02
nrl ff	1.04E+01	7.79E+00	1.58E+00	3.54E−01	2.12E−01	1.65E−01	8.30E−02

TABLE 1. Predicted *S*-matrix differential elastic scattering cross sections for photon energies (50.0, 59.54, 145.4, 316.5, 411.8, 468.1, 661.6, 778.9, 964.0, 1004.8, 1112.1, 1274.5, 1408.0 and 1500.0). The angle integrated total cross sections for each element and energies are presented. ''total'' represents total cross sections from this work, ''rel ff'' represents total cross sections calculated from the relativistic form factor and ''nrl ff'' represents total cross sections calculated from the nonrelativistic form factor—Continued[a]

θ (deg)	Photon energy (keV)						
	778.9	964.0	1004.8	1112.1	1274.5	1408.0	1500.0
Manganese ($Z=25$)							
0.00	4.94E+01	4.94E+01	4.94E+01	4.94E+01	4.94E+01	4.94E+01	4.94E+01
0.01	4.93E+01	4.93E+01	4.93E+01	4.93E+01	4.93E+01	4.92E+01	4.92E+01
0.02	4.92E+01	4.92E+01	4.92E+01	4.91E+01	4.90E+01	4.89E+01	4.88E+01
0.04	4.88E+01	4.85E+01	4.84E+01	4.82E+01	4.78E+01	4.75E+01	4.72E+01
0.06	4.81E+01	4.74E+01	4.72E+01	4.68E+01	4.61E+01	4.55E+01	4.50E+01
0.10	4.60E+01	4.45E+01	4.42E+01	4.33E+01	4.19E+01	4.08E+01	4.01E+01
0.20	3.95E+01	3.65E+01	3.58E+01	3.42E+01	3.18E+01	3.01E+01	2.90E+01
0.30	3.34E+01	2.95E+01	2.87E+01	2.66E+01	2.36E+01	2.12E+01	1.97E+01
0.40	2.80E+01	2.34E+01	2.24E+01	2.01E+01	1.70E+01	1.47E+01	1.33E+01
0.50	2.31E+01	1.83E+01	1.73E+01	1.50E+01	1.22E+01	1.04E+01	9.29E+00
0.60	1.90E+01	1.42E+01	1.33E+01	1.13E+01	8.95E+00	7.51E+00	6.74E+00
0.70	1.55E+01	1.11E+01	1.03E+01	8.62E+00	6.72E+00	5.65E+00	5.12E+00
0.80	1.27E+01	8.81E+00	8.16E+00	6.73E+00	5.21E+00	4.40E+00	4.01E+00
1.00	8.70E+00	5.82E+00	5.37E+00	4.41E+00	3.45E+00	2.97E+00	2.76E+00
1.20	6.21E+00	4.12E+00	3.81E+00	3.16E+00	2.52E+00	2.20E+00	2.07E+00
1.50	4.09E+00	2.78E+00	2.59E+00	2.18E+00	1.73E+00	1.46E+00	1.31E+00
1.70	3.26E+00	2.27E+00	2.11E+00	1.78E+00	1.38E+00	1.09E+00	9.03E−01
2.00	2.46E+00	1.74E+00	1.62E+00	1.34E+00	9.65E−01	6.80E−01	5.01E−01
2.50	1.67E+00	1.11E+00	1.01E+00	7.94E−01	5.17E−01	3.31E−01	2.28E−01
3.00	1.15E+00	6.79E−01	6.06E−01	4.49E−01	2.85E−01	1.94E−01	1.47E−01
3.50	7.87E−01	4.17E−01	3.65E−01	2.63E−01	1.73E−01	1.34E−01	1.18E−01
4.00	5.37E−01	2.69E−01	2.34E−01	1.69E−01	1.18E−01	1.03E−01	1.04E−01
5.00	2.67E−01	1.37E−01	1.21E−01	9.28E−02	7.24E−02	6.94E−02	7.42E−02
6.00	1.55E−01	9.01E−02	8.21E−02	6.64E−02	5.17E−02	4.35E−02	3.87E−02
7.00	1.05E−01	6.86E−02	6.37E−02	5.26E−02	3.72E−02	2.46E−02	1.66E−02
8.00	7.84E−02	5.39E−02	5.00E−02	4.05E−02	2.55E−02	1.38E−02	7.57E−03
9.00	6.17E−02	4.11E−02	3.76E−02	2.90E−02	1.65E−02	8.08E−03	4.11E−03
10.00	4.94E−02	3.01E−02	2.69E−02	1.95E−02	1.03E−02	4.98E−03	2.60E−03
12.50	2.74E−02	1.26E−02	1.05E−02	6.55E−03	3.11E−03	1.65E−03	1.05E−03
15.00	1.42E−02	5.17E−03	4.13E−03	2.32E−03	1.02E−03	5.69E−04	4.03E−04
17.50	7.07E−03	2.21E−03	1.72E−03	9.08E−04	3.76E−04	2.05E−04	1.47E−04
20.00	3.55E−03	1.00E−03	7.64E−04	3.87E−04	1.53E−04	8.03E−05	5.57E−05
22.50	1.82E−03	4.78E−04	3.61E−04	1.78E−04	6.82E−05	3.46E−05	2.33E−05
25.00	9.68E−04	2.41E−04	1.81E−04	8.82E−05	3.33E−05	1.66E−05	1.10E−05
27.50	5.32E−04	1.28E−04	9.61E−05	4.69E−05	1.78E−05	8.93E−06	5.87E−06
30.00	3.03E−04	7.21E−05	5.41E−05	2.67E−05	1.04E−05	5.38E−06	3.59E−06
35.00	1.10E−04	2.65E−05	2.02E−05	1.04E−05	4.45E−06	2.49E−06	1.75E−06
40.00	4.58E−05	1.19E−05	9.28E−06	5.20E−06	2.58E−06	1.65E−06	1.28E−06
45.00	2.20E−05	6.44E−06	5.21E−06	3.24E−06	1.92E−06	1.44E−06	1.24E−06
50.00	1.20E−05	4.05E−06	3.40E−06	2.34E−06	1.61E−06	1.33E−06	1.20E−06
55.00	7.33E−06	2.93E−06	2.55E−06	1.94E−06	1.50E−06	1.30E−06	1.17E−06
60.00	4.99E−06	2.36E−06	2.13E−06	1.77E−06	1.49E−06	1.31E−06	1.13E−06
65.00	3.71E−06	2.04E−06	1.90E−06	1.68E−06	1.50E−06	1.28E−06	1.04E−06
70.00	2.99E−06	1.88E−06	1.80E−06	1.68E−06	1.54E−06	1.27E−06	9.60E−07
75.00	2.56E−06	1.81E−06	1.76E−06	1.72E−06	1.61E−06	1.28E−06	9.12E−07
80.00	2.31E−06	1.77E−06	1.76E−06	1.76E−06	1.67E−06	1.29E−06	8.83E−07
85.00	2.16E−06	1.78E−06	1.78E−06	1.83E−06	1.74E−06	1.32E−06	8.84E−07
90.00	2.10E−06	1.83E−06	1.84E−06	1.92E−06	1.84E−06	1.38E−06	9.13E−07
95.00	2.09E−06	1.89E−06	1.92E−06	2.01E−06	1.94E−06	1.45E−06	9.52E−07
105.00	2.19E−06	2.08E−06	2.13E−06	2.25E−06	2.19E−06	1.65E−06	1.09E−06
120.00	2.52E−06	2.49E−06	2.55E−06	2.71E−06	2.64E−06	2.03E−06	1.40E−06
135.00	2.96E−06	3.00E−06	3.07E−06	3.26E−06	3.18E−06	2.47E−06	1.73E−06
150.00	3.39E−06	3.46E−06	3.55E−06	3.75E−06	3.66E−06	2.90E−06	2.08E−06
165.00	3.70E−06	3.79E−06	3.88E−06	4.11E−06	4.01E−06	3.20E−06	2.33E−06
180.00	3.81E−06	3.91E−06	4.01E−06	4.23E−06	4.14E−06	3.33E−06	2.44E−06
total	5.86E−02	3.84E−02	3.54E−02	2.90E−02	2.20E−02	1.78E−02	1.57E−02
rel ff	5.94E−02	3.88E−02	3.58E−02	2.91E−02	2.22E−02	1.82E−02	1.61E−02
nrl ff	6.00E−02	3.92E−02	3.61E−02	2.95E−02	2.24E−02	1.84E−02	1.62E−02

TABLE 1. Predicted *S*-matrix differential elastic scattering cross sections for photon energies (50.0, 59.54, 145.4, 316.5, 411.8, 468.1, 661.6, 778.9, 964.0, 1004.8, 1112.1, 1274.5, 1408.0 and 1500.0). The angle integrated total cross sections for each element and energies are presented. ''total'' represents total cross sections from this work, ''rel ff'' represents total cross sections calculated from the relativistic form factor and ''nrl ff'' represents total cross sections calculated from the nonrelativistic form factor—Continued[a]

θ (deg)	Photon energy (keV)						
	50.0	59.5	145.4	316.5	411.8	468.1	661.6
Iron ($Z=26$)							
0.00	5.39E+01	5.38E+01	5.35E+01	5.35E+01	5.34E+01	5.34E+01	5.34E+01
0.01	5.39E+01	5.38E+01	5.35E+01	5.34E+01	5.34E+01	5.34E+01	5.34E+01
0.02	5.39E+01	5.38E+01	5.35E+01	5.34E+01	5.34E+01	5.34E+01	5.33E+01
0.04	5.39E+01	5.38E+01	5.35E+01	5.33E+01	5.33E+01	5.32E+01	5.30E+01
0.06	5.39E+01	5.38E+01	5.34E+01	5.32E+01	5.31E+01	5.30E+01	5.25E+01
0.10	5.38E+01	5.38E+01	5.34E+01	5.28E+01	5.24E+01	5.21E+01	5.09E+01
0.20	5.38E+01	5.37E+01	5.30E+01	5.11E+01	4.97E+01	4.88E+01	4.54E+01
0.30	5.38E+01	5.36E+01	5.23E+01	4.87E+01	4.62E+01	4.47E+01	3.96E+01
0.40	5.37E+01	5.35E+01	5.15E+01	4.59E+01	4.25E+01	4.06E+01	3.44E+01
0.50	5.35E+01	5.33E+01	5.05E+01	4.32E+01	3.90E+01	3.68E+01	2.96E+01
0.60	5.33E+01	5.30E+01	4.94E+01	4.04E+01	3.58E+01	3.32E+01	2.52E+01
0.70	5.32E+01	5.28E+01	4.82E+01	3.78E+01	3.26E+01	2.98E+01	2.14E+01
0.80	5.30E+01	5.24E+01	4.69E+01	3.53E+01	2.97E+01	2.67E+01	1.80E+01
1.00	5.25E+01	5.17E+01	4.43E+01	3.06E+01	2.43E+01	2.11E+01	1.29E+01
1.20	5.19E+01	5.09E+01	4.17E+01	2.63E+01	1.97E+01	1.66E+01	9.31E+00
1.50	5.08E+01	4.95E+01	3.80E+01	2.07E+01	1.44E+01	1.17E+01	6.05E+00
1.70	5.00E+01	4.85E+01	3.57E+01	1.76E+01	1.17E+01	9.31E+00	4.74E+00
2.00	4.87E+01	4.69E+01	3.24E+01	1.38E+01	8.68E+00	6.83E+00	3.51E+00
2.50	4.64E+01	4.42E+01	2.73E+01	9.40E+00	5.63E+00	4.43E+00	2.43E+00
3.00	4.41E+01	4.16E+01	2.28E+01	6.64E+00	3.97E+00	3.16E+00	1.81E+00
3.50	4.21E+01	3.91E+01	1.89E+01	4.92E+00	3.04E+00	2.43E+00	1.35E+00
4.00	4.02E+01	3.67E+01	1.57E+01	3.82E+00	2.45E+00	1.94E+00	9.81E−01
5.00	3.67E+01	3.21E+01	1.09E+01	2.57E+00	1.70E+00	1.29E+00	5.09E−01
6.00	3.33E+01	2.79E+01	7.73E+00	1.89E+00	1.16E+00	8.36E−01	2.80E−01
7.00	2.98E+01	2.41E+01	5.72E+00	1.42E+00	7.75E−01	5.35E−01	1.73E−01
8.00	2.62E+01	2.07E+01	4.41E+00	1.07E+00	5.15E−01	3.49E−01	1.22E−01
9.00	2.27E+01	1.77E+01	3.55E+00	7.93E−01	3.50E−01	2.38E−01	9.42E−02
10.00	1.95E+01	1.52E+01	2.96E+00	5.87E−01	2.47E−01	1.72E−01	7.71E−02
12.50	1.30E+01	1.04E+01	2.06E+00	2.90E−01	1.29E−01	9.41E−02	4.92E−02
15.00	8.96E+00	7.36E+00	1.48E+00	1.64E−01	8.65E−02	6.43E−02	2.98E−02
17.50	6.55E+00	5.40E+00	1.05E+00	1.07E−01	6.44E−02	4.73E−02	1.71E−02
20.00	5.13E+00	4.14E+00	7.27E−01	7.77E−02	4.84E−02	3.42E−02	9.66E−03
22.50	4.25E+00	3.31E+00	5.03E−01	6.04E−02	3.55E−02	2.39E−02	5.44E−03
25.00	3.67E+00	2.74E+00	3.53E−01	4.82E−02	2.55E−02	1.62E−02	3.11E−03
27.50	3.23E+00	2.31E+00	2.55E−01	3.85E−02	1.79E−02	1.08E−02	1.81E−03
30.00	2.87E+00	1.98E+00	1.91E−01	3.05E−02	1.25E−02	7.17E−03	1.07E−03
35.00	2.23E+00	1.48E+00	1.19E−01	1.84E−02	6.06E−03	3.20E−03	4.06E−04
40.00	1.65E+00	1.09E+00	8.37E−02	1.07E−02	2.99E−03	1.48E−03	1.70E−04
45.00	1.18E+00	7.96E−01	6.35E−02	6.16E−03	1.52E−03	7.18E−04	7.84E−05
50.00	8.27E−01	5.75E−01	4.99E−02	3.57E−03	8.03E−04	3.68E−04	3.99E−05
55.00	5.81E−01	4.17E−01	3.95E−02	2.10E−03	4.43E−04	1.99E−04	2.23E−05
60.00	4.15E−01	3.07E−01	3.12E−02	1.27E−03	2.57E−04	1.14E−04	1.37E−05
65.00	3.04E−01	2.30E−01	2.47E−02	7.98E−04	1.56E−04	6.99E−05	9.17E−06
70.00	2.30E−01	1.77E−01	1.96E−02	5.18E−04	1.00E−04	4.54E−05	6.66E−06
75.00	1.81E−01	1.41E−01	1.56E−02	3.51E−04	6.80E−05	3.14E−05	5.21E−06
80.00	1.48E−01	1.16E−01	1.26E−02	2.48E−04	4.87E−05	2.30E−05	4.34E−06
85.00	1.26E−01	9.83E−02	1.04E−02	1.83E−04	3.68E−05	1.78E−05	3.81E−06
90.00	1.11E−01	8.66E−02	8.73E−03	1.42E−04	2.93E−05	1.45E−05	3.50E−06
95.00	1.02E−01	7.87E−02	7.50E−03	1.14E−04	2.43E−05	1.24E−05	3.32E−06
105.00	9.28E−02	7.08E−02	5.90E−03	8.20E−05	1.88E−05	1.01E−05	3.25E−06
120.00	9.42E−02	6.95E−02	4.71E−03	6.09E−05	1.54E−05	8.77E−06	3.49E−06
135.00	1.03E−01	7.39E−02	4.15E−03	5.21E−05	1.43E−05	8.52E−06	3.91E−06
150.00	1.13E−01	7.93E−02	3.87E−03	4.81E−05	1.40E−05	8.63E−06	4.35E−06
165.00	1.21E−01	8.33E−02	3.73E−03	4.63E−05	1.40E−05	8.79E−06	4.67E−06
180.00	1.24E−01	8.48E−02	3.69E−03	4.58E−05	1.40E−05	8.85E−06	4.79E−06
total	1.14E+01	8.83E+00	1.73E+00	3.86E−01	2.31E−01	1.79E−01	9.05E−02
rel ff	1.14E+01	8.55E+00	1.73E+00	3.89E−01	2.33E−01	1.81E−01	9.13E−02
nrl ff	1.15E+01	8.62E+00	1.75E+00	3.93E−01	2.36E−01	1.83E−01	9.23E−02

TABLE 1. Predicted *S*-matrix differential elastic scattering cross sections for photon energies (50.0, 59.54, 145.4, 316.5, 411.8, 468.1, 661.6, 778.9, 964.0, 1004.8, 1112.1, 1274.5, 1408.0 and 1500.0). The angle integrated total cross sections for each element and energies are presented. ''total'' represents total cross sections from this work, ''rel ff'' represents total cross sections calculated from the relativistic form factor and ''nrl ff'' represents total cross sections calculated from the nonrelativistic form factor—Continued[a]

θ (deg)	Photon energy (keV)						
	778.9	964.0	1004.8	1112.1	1274.5	1408.0	1500.0
Iron ($Z=26$)							
0.00	5.34E+01	5.34E+01	5.34E+01	5.34E+01	5.34E+01	5.34E+01	5.34E+01
0.01	5.34E+01	5.33E+01	5.33E+01	5.33E+01	5.33E+01	5.32E+01	5.32E+01
0.02	5.33E+01	5.32E+01	5.32E+01	5.31E+01	5.30E+01	5.29E+01	5.28E+01
0.04	5.28E+01	5.25E+01	5.24E+01	5.22E+01	5.18E+01	5.15E+01	5.12E+01
0.06	5.21E+01	5.14E+01	5.12E+01	5.08E+01	5.01E+01	4.95E+01	4.91E+01
0.10	5.00E+01	4.85E+01	4.82E+01	4.72E+01	4.58E+01	4.46E+01	4.39E+01
0.20	4.33E+01	4.01E+01	3.94E+01	3.76E+01	3.50E+01	3.32E+01	3.20E+01
0.30	3.68E+01	3.25E+01	3.16E+01	2.94E+01	2.61E+01	2.36E+01	2.20E+01
0.40	3.09E+01	2.59E+01	2.49E+01	2.24E+01	1.89E+01	1.64E+01	1.49E+01
0.50	2.57E+01	2.03E+01	1.93E+01	1.68E+01	1.36E+01	1.15E+01	1.03E+01
0.60	2.11E+01	1.59E+01	1.49E+01	1.26E+01	9.93E+00	8.28E+00	7.37E+00
0.70	1.73E+01	1.24E+01	1.15E+01	9.58E+00	7.40E+00	6.16E+00	5.53E+00
0.80	1.42E+01	9.78E+00	9.04E+00	7.42E+00	5.69E+00	4.76E+00	4.31E+00
1.00	9.65E+00	6.37E+00	5.86E+00	4.78E+00	3.72E+00	3.21E+00	3.00E+00
1.20	6.82E+00	4.46E+00	4.11E+00	3.39E+00	2.71E+00	2.41E+00	2.32E+00
1.50	4.43E+00	2.99E+00	2.78E+00	2.35E+00	1.90E+00	1.65E+00	1.50E+00
1.70	3.52E+00	2.45E+00	2.30E+00	1.95E+00	1.54E+00	1.24E+00	1.04E+00
2.00	2.67E+00	1.91E+00	1.79E+00	1.50E+00	1.10E+00	7.78E−01	5.72E−01
2.50	1.84E+00	1.26E+00	1.16E+00	9.17E−01	5.97E−01	3.73E−01	2.49E−01
3.00	1.30E+00	7.83E−01	7.00E−01	5.21E−01	3.25E−01	2.12E−01	1.55E−01
3.50	8.99E−01	4.79E−01	4.19E−01	3.00E−01	1.93E−01	1.44E−01	1.24E−01
4.00	6.16E−01	3.04E−01	2.64E−01	1.88E−01	1.29E−01	1.12E−01	1.12E−01
5.00	3.02E−01	1.50E−01	1.32E−01	9.94E−02	7.78E−02	7.74E−02	8.69E−02
6.00	1.72E−01	9.71E−02	8.81E−02	7.09E−02	5.63E−02	4.97E−02	4.67E−02
7.00	1.14E−01	7.44E−02	6.91E−02	5.74E−02	4.16E−02	2.84E−02	1.98E−02
8.00	8.51E−02	5.93E−02	5.54E−02	4.55E−02	2.93E−02	1.61E−02	8.88E−03
9.00	6.73E−02	4.61E−02	4.25E−02	3.34E−02	1.94E−02	9.54E−03	4.80E−03
10.00	5.44E−02	3.44E−02	3.10E−02	2.29E−02	1.24E−02	5.96E−03	3.05E−03
12.50	3.12E−02	1.49E−02	1.26E−02	8.00E−03	3.87E−03	2.04E−03	1.27E−03
15.00	1.66E−02	6.30E−03	5.08E−03	2.90E−03	1.30E−03	7.21E−04	5.06E−04
17.50	8.53E−03	2.76E−03	2.16E−03	1.15E−03	4.82E−04	2.64E−04	1.88E−04
20.00	4.37E−03	1.26E−03	9.69E−04	4.95E−04	1.97E−04	1.04E−04	7.19E−05
22.50	2.28E−03	6.09E−04	4.61E−04	2.29E−04	8.75E−05	4.44E−05	2.99E−05
25.00	1.22E−03	3.08E−04	2.31E−04	1.13E−04	4.24E−05	2.11E−05	1.38E−05
27.50	6.77E−04	1.64E−04	1.23E−04	5.97E−05	2.24E−05	1.11E−05	7.22E−06
30.00	3.88E−04	9.21E−05	6.90E−05	3.37E−05	1.29E−05	6.51E−06	4.29E−06
35.00	1.41E−04	3.34E−05	2.52E−05	1.28E−05	5.27E−06	2.86E−06	1.97E−06
40.00	5.82E−05	1.46E−05	1.13E−05	6.17E−06	2.93E−06	1.82E−06	1.39E−06
45.00	2.75E−05	7.71E−06	6.16E−06	3.71E−06	2.12E−06	1.55E−06	1.33E−06
50.00	1.47E−05	4.72E−06	3.91E−06	2.61E−06	1.73E−06	1.42E−06	1.29E−06
55.00	8.85E−06	3.33E−06	2.86E−06	2.11E−06	1.59E−06	1.39E−06	1.28E−06
60.00	5.92E−06	2.63E−06	2.35E−06	1.90E−06	1.58E−06	1.40E−06	1.25E−06
65.00	4.33E−06	2.25E−06	2.07E−06	1.79E−06	1.58E−06	1.37E−06	1.15E−06
70.00	3.44E−06	2.05E−06	1.94E−06	1.78E−06	1.63E−06	1.36E−06	1.07E−06
75.00	2.92E−06	1.97E−06	1.90E−06	1.83E−06	1.71E−06	1.37E−06	1.01E−06
80.00	2.61E−06	1.93E−06	1.89E−06	1.88E−06	1.77E−06	1.39E−06	9.69E−07
85.00	2.43E−06	1.93E−06	1.92E−06	1.95E−06	1.86E−06	1.42E−06	9.64E−07
90.00	2.35E−06	1.98E−06	1.99E−06	2.05E−06	1.97E−06	1.49E−06	9.89E−07
95.00	2.33E−06	2.05E−06	2.07E−06	2.16E−06	2.08E−06	1.56E−06	1.03E−06
105.00	2.43E−06	2.26E−06	2.30E−06	2.43E−06	2.35E−06	1.77E−06	1.17E−06
120.00	2.77E−06	2.70E−06	2.76E−06	2.93E−06	2.85E−06	2.18E−06	1.48E−06
135.00	3.25E−06	3.25E−06	3.33E−06	3.53E−06	3.43E−06	2.64E−06	1.83E−06
150.00	3.70E−06	3.74E−06	3.83E−06	4.06E−06	3.95E−06	3.09E−06	2.18E−06
165.00	4.03E−06	4.10E−06	4.20E−06	4.44E−06	4.32E−06	3.42E−06	2.45E−06
180.00	4.15E−06	4.23E−06	4.33E−06	4.58E−06	4.46E−06	3.55E−06	2.56E−06
total	6.52E−02	4.27E−02	3.94E−02	3.23E−02	2.44E−02	1.98E−02	1.75E−02
rel ff	6.61E−02	4.32E−02	3.98E−02	3.24E−02	2.47E−02	2.03E−02	1.79E−02
nrl ff	6.68E−02	4.37E−02	4.02E−02	3.28E−02	2.49E−02	2.05E−02	1.81E−02

TABLE 1. Predicted *S*-matrix differential elastic scattering cross sections for photon energies (50.0, 59.54, 145.4, 316.5, 411.8, 468.1, 661.6, 778.9, 964.0, 1004.8, 1112.1, 1274.5, 1408.0 and 1500.0). The angle integrated total cross sections for each element and energies are presented. ''total'' represents total cross sections from this work, ''rel ff'' represents total cross sections calculated from the relativistic form factor and ''nrl ff'' represents total cross sections calculated from the nonrelativistic form factor—Continued[a]

θ (deg)	Photon energy (keV)						
	50.0	59.5	145.4	316.5	411.8	468.1	661.6
Cobalt ($Z=27$)							
0.00	5.81E+01	5.81E+01	5.77E+01	5.76E+01	5.76E+01	5.76E+01	5.76E+01
0.01	5.81E+01	5.81E+01	5.77E+01	5.76E+01	5.76E+01	5.76E+01	5.75E+01
0.02	5.81E+01	5.81E+01	5.77E+01	5.76E+01	5.76E+01	5.75E+01	5.75E+01
0.04	5.81E+01	5.81E+01	5.77E+01	5.75E+01	5.74E+01	5.74E+01	5.72E+01
0.06	5.81E+01	5.80E+01	5.76E+01	5.74E+01	5.73E+01	5.71E+01	5.66E+01
0.10	5.81E+01	5.80E+01	5.76E+01	5.70E+01	5.66E+01	5.63E+01	5.51E+01
0.20	5.80E+01	5.80E+01	5.72E+01	5.53E+01	5.39E+01	5.29E+01	4.94E+01
0.30	5.80E+01	5.79E+01	5.65E+01	5.28E+01	5.02E+01	4.87E+01	4.33E+01
0.40	5.79E+01	5.77E+01	5.57E+01	5.00E+01	4.64E+01	4.43E+01	3.77E+01
0.50	5.77E+01	5.75E+01	5.47E+01	4.70E+01	4.27E+01	4.02E+01	3.25E+01
0.60	5.76E+01	5.73E+01	5.35E+01	4.41E+01	3.91E+01	3.63E+01	2.78E+01
0.70	5.74E+01	5.70E+01	5.23E+01	4.13E+01	3.57E+01	3.27E+01	2.36E+01
0.80	5.72E+01	5.67E+01	5.09E+01	3.86E+01	3.26E+01	2.93E+01	2.00E+01
1.00	5.68E+01	5.59E+01	4.82E+01	3.35E+01	2.68E+01	2.33E+01	1.42E+01
1.20	5.62E+01	5.51E+01	4.55E+01	2.89E+01	2.18E+01	1.84E+01	1.03E+01
1.50	5.51E+01	5.37E+01	4.16E+01	2.29E+01	1.59E+01	1.29E+01	6.61E+00
1.70	5.43E+01	5.27E+01	3.91E+01	1.95E+01	1.29E+01	1.03E+01	5.15E+00
2.00	5.29E+01	5.10E+01	3.55E+01	1.53E+01	9.57E+00	7.49E+00	3.80E+00
2.50	5.05E+01	4.82E+01	3.01E+01	1.04E+01	6.14E+00	4.81E+00	2.64E+00
3.00	4.81E+01	4.54E+01	2.52E+01	7.29E+00	4.31E+00	3.42E+00	1.99E+00
3.50	4.59E+01	4.27E+01	2.10E+01	5.36E+00	3.28E+00	2.63E+00	1.50E+00
4.00	4.39E+01	4.01E+01	1.74E+01	4.14E+00	2.66E+00	2.12E+00	1.11E+00
5.00	4.01E+01	3.52E+01	1.20E+01	2.79E+00	1.87E+00	1.44E+00	5.79E−01
6.00	3.66E+01	3.07E+01	8.51E+00	2.07E+00	1.31E+00	9.45E−01	3.14E−01
7.00	3.29E+01	2.66E+01	6.25E+00	1.58E+00	8.80E−01	6.08E−01	1.91E−01
8.00	2.91E+01	2.29E+01	4.79E+00	1.20E+00	5.85E−01	3.96E−01	1.33E−01
9.00	2.53E+01	1.96E+01	3.84E+00	8.96E−01	3.95E−01	2.68E−01	1.02E−01
10.00	2.17E+01	1.68E+01	3.20E+00	6.66E−01	2.77E−01	1.91E−01	8.38E−02
12.50	1.45E+01	1.15E+01	2.25E+00	3.27E−01	1.41E−01	1.03E−01	5.43E−02
15.00	9.84E+00	8.10E+00	1.65E+00	1.82E−01	9.40E−02	7.00E−02	3.37E−02
17.50	7.10E+00	5.90E+00	1.18E+00	1.17E−01	7.03E−02	5.20E−02	1.99E−02
20.00	5.51E+00	4.50E+00	8.26E−01	8.46E−02	5.34E−02	3.82E−02	1.14E−02
22.50	4.55E+00	3.59E+00	5.72E−01	6.58E−02	3.98E−02	2.71E−02	6.56E−03
25.00	3.93E+00	2.97E+00	4.00E−01	5.28E−02	2.89E−02	1.87E−02	3.80E−03
27.50	3.48E+00	2.52E+00	2.87E−01	4.26E−02	2.07E−02	1.27E−02	2.23E−03
30.00	3.12E+00	2.17E+00	2.13E−01	3.41E−02	1.46E−02	8.55E−03	1.34E−03
35.00	2.47E+00	1.64E+00	1.31E−01	2.11E−02	7.26E−03	3.90E−03	5.12E−04
40.00	1.87E+00	1.22E+00	9.13E−02	1.25E−02	3.64E−03	1.83E−03	2.15E−04
45.00	1.35E+00	9.00E−01	6.92E−02	7.34E−03	1.88E−03	8.99E−04	9.90E−05
50.00	9.54E−01	6.55E−01	5.45E−02	4.32E−03	1.00E−03	4.63E−04	4.99E−05
55.00	6.71E−01	4.76E−01	4.34E−02	2.58E−03	5.57E−04	2.52E−04	2.77E−05
60.00	4.78E−01	3.49E−01	3.46E−02	1.58E−03	3.24E−04	1.45E−04	1.68E−05
65.00	3.48E−01	2.61E−01	2.76E−02	9.94E−04	1.97E−04	8.82E−05	1.11E−05
70.00	2.62E−01	2.00E−01	2.21E−02	6.50E−04	1.27E−04	5.71E−05	7.96E−06
75.00	2.04E−01	1.58E−01	1.78E−02	4.41E−04	8.59E−05	3.93E−05	6.16E−06
80.00	1.66E−01	1.29E−01	1.45E−02	3.13E−04	6.14E−05	2.87E−05	5.08E−06
85.00	1.40E−01	1.09E−01	1.20E−02	2.32E−04	4.63E−05	2.21E−05	4.42E−06
90.00	1.22E−01	9.60E−02	1.02E−02	1.79E−04	3.67E−05	1.80E−05	4.04E−06
95.00	1.11E−01	8.70E−02	8.82E−03	1.44E−04	3.04E−05	1.53E−05	3.82E−06
105.00	1.01E−01	7.79E−02	7.02E−03	1.04E−04	2.33E−05	1.23E−05	3.70E−06
120.00	1.02E−01	7.63E−02	5.67E−03	7.69E−05	1.89E−05	1.06E−05	3.93E−06
135.00	1.11E−01	8.11E−02	5.05E−03	6.55E−05	1.73E−05	1.01E−05	4.37E−06
150.00	1.22E−01	8.71E−02	4.73E−03	6.02E−05	1.69E−05	1.02E−05	4.84E−06
165.00	1.30E−01	9.16E−02	4.58E−03	5.78E−05	1.68E−05	1.03E−05	5.18E−06
180.00	1.34E−01	9.32E−02	4.53E−03	5.71E−05	1.68E−05	1.04E−05	5.31E−06
total	1.26E+01	9.75E+00	1.91E+00	4.27E−01	2.56E−01	1.98E−01	1.00E−01
rel ff	1.26E+01	9.43E+00	1.92E+00	4.31E−01	2.59E−01	2.01E−01	1.01E−01
nrl ff	1.27E+01	9.51E+00	1.94E+00	4.36E−01	2.62E−01	2.03E−01	1.02E−01

TABLE 1. Predicted *S*-matrix differential elastic scattering cross sections for photon energies (50.0, 59.54, 145.4, 316.5, 411.8, 468.1, 661.6, 778.9, 964.0, 1004.8, 1112.1, 1274.5, 1408.0 and 1500.0). The angle integrated total cross sections for each element and energies are presented. ''total'' represents total cross sections from this work, ''rel ff'' represents total cross sections calculated from the relativistic form factor and ''nrl ff'' represents total cross sections calculated from the nonrelativistic form factor—Continued[a]

θ (deg)	Photon energy (keV)						
	778.9	964.0	1004.8	1112.1	1274.5	1408.0	1500.0
Cobalt ($Z=27$)							
0.00	5.76E+01	5.76E+01	5.76E+01	5.76E+01	5.76E+01	5.76E+01	5.75E+01
0.01	5.75E+01	5.75E+01	5.75E+01	5.75E+01	5.75E+01	5.74E+01	5.74E+01
0.02	5.74E+01	5.74E+01	5.74E+01	5.73E+01	5.72E+01	5.70E+01	5.69E+01
0.04	5.70E+01	5.67E+01	5.66E+01	5.63E+01	5.60E+01	5.57E+01	5.54E+01
0.06	5.63E+01	5.56E+01	5.54E+01	5.50E+01	5.43E+01	5.37E+01	5.32E+01
0.10	5.42E+01	5.26E+01	5.23E+01	5.13E+01	4.98E+01	4.86E+01	4.78E+01
0.20	4.72E+01	4.37E+01	4.30E+01	4.11E+01	3.84E+01	3.63E+01	3.51E+01
0.30	4.02E+01	3.56E+01	3.47E+01	3.22E+01	2.87E+01	2.61E+01	2.43E+01
0.40	3.39E+01	2.85E+01	2.74E+01	2.47E+01	2.09E+01	1.82E+01	1.65E+01
0.50	2.83E+01	2.25E+01	2.13E+01	1.86E+01	1.51E+01	1.27E+01	1.14E+01
0.60	2.33E+01	1.76E+01	1.65E+01	1.40E+01	1.10E+01	9.10E+00	8.06E+00
0.70	1.92E+01	1.37E+01	1.28E+01	1.06E+01	8.14E+00	6.72E+00	5.99E+00
0.80	1.57E+01	1.08E+01	9.98E+00	8.16E+00	6.22E+00	5.16E+00	4.65E+00
1.00	1.07E+01	6.97E+00	6.40E+00	5.20E+00	4.02E+00	3.47E+00	3.27E+00
1.20	7.48E+00	4.83E+00	4.45E+00	3.66E+00	2.93E+00	2.64E+00	2.57E+00
1.50	4.81E+00	3.23E+00	3.01E+00	2.54E+00	2.08E+00	1.83E+00	1.71E+00
1.70	3.81E+00	2.66E+00	2.49E+00	2.13E+00	1.70E+00	1.40E+00	1.19E+00
2.00	2.89E+00	2.10E+00	1.97E+00	1.67E+00	1.24E+00	8.82E−01	6.49E−01
2.50	2.02E+00	1.41E+00	1.31E+00	1.04E+00	6.81E−01	4.20E−01	2.73E−01
3.00	1.45E+00	8.91E−01	8.00E−01	5.97E−01	3.68E−01	2.34E−01	1.65E−01
3.50	1.02E+00	5.46E−01	4.78E−01	3.41E−01	2.15E−01	1.57E−01	1.31E−01
4.00	6.99E−01	3.44E−01	2.97E−01	2.10E−01	1.42E−01	1.21E−01	1.21E−01
5.00	3.41E−01	1.65E−01	1.44E−01	1.07E−01	8.40E−02	8.55E−02	9.93E−02
6.00	1.91E−01	1.05E−01	9.50E−02	7.61E−02	6.11E−02	5.60E−02	5.49E−02
7.00	1.25E−01	8.06E−02	7.48E−02	6.24E−02	4.61E−02	3.25E−02	2.33E−02
8.00	9.26E−02	6.49E−02	6.08E−02	5.05E−02	3.32E−02	1.86E−02	1.04E−02
9.00	7.33E−02	5.12E−02	4.75E−02	3.79E−02	2.26E−02	1.12E−02	5.62E−03
10.00	5.96E−02	3.88E−02	3.52E−02	2.66E−02	1.47E−02	7.06E−03	3.59E−03
12.50	3.51E−02	1.74E−02	1.49E−02	9.64E−03	4.74E−03	2.49E−03	1.53E−03
15.00	1.93E−02	7.59E−03	6.16E−03	3.58E−03	1.63E−03	9.00E−04	6.26E−04
17.50	1.01E−02	3.39E−03	2.67E−03	1.44E−03	6.11E−04	3.34E−04	2.37E−04
20.00	5.29E−03	1.57E−03	1.21E−03	6.25E−04	2.50E−04	1.32E−04	9.16E−05
22.50	2.81E−03	7.66E−04	5.82E−04	2.90E−04	1.11E−04	5.65E−05	3.79E−05
25.00	1.52E−03	3.90E−04	2.93E−04	1.43E−04	5.36E−05	2.65E−05	1.74E−05
27.50	8.50E−04	2.08E−04	1.56E−04	7.54E−05	2.80E−05	1.37E−05	8.87E−06
30.00	4.89E−04	1.17E−04	8.71E−05	4.22E−05	1.59E−05	7.87E−06	5.13E−06
35.00	1.78E−04	4.18E−05	3.14E−05	1.56E−05	6.26E−06	3.30E−06	2.23E−06
40.00	7.33E−05	1.80E−05	1.38E−05	7.32E−06	3.35E−06	2.02E−06	1.52E−06
45.00	3.42E−05	9.23E−06	7.29E−06	4.28E−06	2.35E−06	1.68E−06	1.43E−06
50.00	1.80E−05	5.51E−06	4.51E−06	2.92E−06	1.88E−06	1.52E−06	1.39E−06
55.00	1.07E−05	3.80E−06	3.23E−06	2.31E−06	1.70E−06	1.49E−06	1.40E−06
60.00	7.02E−06	2.95E−06	2.61E−06	2.05E−06	1.67E−06	1.51E−06	1.38E−06
65.00	5.06E−06	2.49E−06	2.27E−06	1.92E−06	1.67E−06	1.47E−06	1.28E−06
70.00	3.97E−06	2.25E−06	2.11E−06	1.90E−06	1.72E−06	1.47E−06	1.18E−06
75.00	3.34E−06	2.15E−06	2.06E−06	1.95E−06	1.81E−06	1.48E−06	1.11E−06
80.00	2.96E−06	2.09E−06	2.05E−06	2.00E−06	1.88E−06	1.49E−06	1.06E−06
85.00	2.74E−06	2.10E−06	2.08E−06	2.09E−06	1.98E−06	1.53E−06	1.05E−06
90.00	2.63E−06	2.15E−06	2.15E−06	2.20E−06	2.10E−06	1.60E−06	1.08E−06
95.00	2.60E−06	2.23E−06	2.24E−06	2.32E−06	2.22E−06	1.67E−06	1.11E−06
105.00	2.70E−06	2.46E−06	2.49E−06	2.62E−06	2.52E−06	1.90E−06	1.26E−06
120.00	3.06E−06	2.93E−06	2.99E−06	3.16E−06	3.07E−06	2.34E−06	1.58E−06
135.00	3.56E−06	3.52E−06	3.60E−06	3.81E−06	3.69E−06	2.83E−06	1.94E−06
150.00	4.04E−06	4.05E−06	4.14E−06	4.38E−06	4.25E−06	3.30E−06	2.30E−06
165.00	4.39E−06	4.43E−06	4.53E−06	4.79E−06	4.65E−06	3.64E−06	2.58E−06
180.00	4.52E−06	4.56E−06	4.67E−06	4.93E−06	4.80E−06	3.78E−06	2.70E−06
total	7.22E−02	4.73E−02	4.36E−02	3.57E−02	2.71E−02	2.20E−02	1.94E−02
rel ff	7.33E−02	4.79E−02	4.41E−02	3.60E−02	2.73E−02	2.25E−02	1.98E−02
nrl ff	7.41E−02	4.85E−02	4.46E−02	3.64E−02	2.77E−02	2.27E−02	2.01E−02

TABLE 1. Predicted *S*-matrix differential elastic scattering cross sections for photon energies (50.0, 59.54, 145.4, 316.5, 411.8, 468.1, 661.6, 778.9, 964.0, 1004.8, 1112.1, 1274.5, 1408.0 and 1500.0). The angle integrated total cross sections for each element and energies are presented. ''total'' represents total cross sections from this work, ''rel ff'' represents total cross sections calculated from the relativistic form factor and ''nrl ff'' represents total cross sections calculated from the nonrelativistic form factor—Continued[a]

θ (deg)	Photon energy (keV)						
	50.0	59.5	145.4	316.5	411.8	468.1	661.6
Nickel ($Z=28$)							
0.00	6.25E+01	6.25E+01	6.21E+01	6.20E+01	6.20E+01	6.19E+01	6.19E+01
0.01	6.25E+01	6.25E+01	6.21E+01	6.19E+01	6.19E+01	6.19E+01	6.19E+01
0.02	6.25E+01	6.25E+01	6.20E+01	6.19E+01	6.19E+01	6.19E+01	6.18E+01
0.04	6.25E+01	6.24E+01	6.20E+01	6.18E+01	6.18E+01	6.17E+01	6.15E+01
0.06	6.25E+01	6.24E+01	6.20E+01	6.17E+01	6.16E+01	6.15E+01	6.10E+01
0.10	6.25E+01	6.24E+01	6.19E+01	6.13E+01	6.09E+01	6.06E+01	5.94E+01
0.20	6.24E+01	6.24E+01	6.15E+01	5.96E+01	5.82E+01	5.72E+01	5.35E+01
0.30	6.24E+01	6.23E+01	6.09E+01	5.71E+01	5.44E+01	5.27E+01	4.70E+01
0.40	6.23E+01	6.21E+01	6.00E+01	5.41E+01	5.03E+01	4.81E+01	4.10E+01
0.50	6.21E+01	6.19E+01	5.90E+01	5.10E+01	4.63E+01	4.37E+01	3.54E+01
0.60	6.20E+01	6.17E+01	5.78E+01	4.79E+01	4.26E+01	3.96E+01	3.04E+01
0.70	6.18E+01	6.14E+01	5.65E+01	4.49E+01	3.89E+01	3.57E+01	2.59E+01
0.80	6.16E+01	6.10E+01	5.51E+01	4.20E+01	3.56E+01	3.20E+01	2.19E+01
1.00	6.12E+01	6.03E+01	5.23E+01	3.66E+01	2.93E+01	2.56E+01	1.57E+01
1.20	6.06E+01	5.95E+01	4.94E+01	3.16E+01	2.40E+01	2.02E+01	1.13E+01
1.50	5.95E+01	5.80E+01	4.52E+01	2.51E+01	1.75E+01	1.42E+01	7.23E+00
1.70	5.87E+01	5.70E+01	4.26E+01	2.15E+01	1.42E+01	1.13E+01	5.61E+00
2.00	5.73E+01	5.53E+01	3.87E+01	1.69E+01	1.05E+01	8.21E+00	4.12E+00
2.50	5.47E+01	5.23E+01	3.28E+01	1.14E+01	6.70E+00	5.24E+00	2.87E+00
3.00	5.22E+01	4.93E+01	2.76E+01	7.98E+00	4.68E+00	3.72E+00	2.18E+00
3.50	4.98E+01	4.64E+01	2.30E+01	5.85E+00	3.56E+00	2.86E+00	1.67E+00
4.00	4.76E+01	4.37E+01	1.92E+01	4.51E+00	2.89E+00	2.32E+00	1.24E+00
5.00	4.36E+01	3.84E+01	1.33E+01	3.03E+00	2.06E+00	1.59E+00	6.52E−01
6.00	3.99E+01	3.35E+01	9.34E+00	2.26E+00	1.45E+00	1.06E+00	3.52E−01
7.00	3.61E+01	2.91E+01	6.82E+00	1.74E+00	9.88E−01	6.85E−01	2.12E−01
8.00	3.21E+01	2.51E+01	5.21E+00	1.33E+00	6.59E−01	4.45E−01	1.46E−01
9.00	2.80E+01	2.16E+01	4.17E+00	1.00E+00	4.45E−01	3.00E−01	1.12E−01
10.00	2.41E+01	1.86E+01	3.47E+00	7.49E−01	3.10E−01	2.12E−01	9.11E−02
12.50	1.60E+01	1.27E+01	2.46E+00	3.68E−01	1.55E−01	1.12E−01	5.96E−02
15.00	1.08E+01	8.89E+00	1.82E+00	2.02E−01	1.02E−01	7.62E−02	3.77E−02
17.50	7.73E+00	6.45E+00	1.32E+00	1.29E−01	7.65E−02	5.69E−02	2.27E−02
20.00	5.95E+00	4.90E+00	9.29E−01	9.23E−02	5.86E−02	4.24E−02	1.34E−02
22.50	4.90E+00	3.90E+00	6.46E−01	7.17E−02	4.41E−02	3.05E−02	7.80E−03
25.00	4.23E+00	3.22E+00	4.51E−01	5.78E−02	3.26E−02	2.14E−02	4.58E−03
27.50	3.76E+00	2.74E+00	3.22E−01	4.69E−02	2.36E−02	1.47E−02	2.72E−03
30.00	3.38E+00	2.37E+00	2.37E−01	3.78E−02	1.69E−02	1.01E−02	1.65E−03
35.00	2.72E+00	1.80E+00	1.44E−01	2.38E−02	8.59E−03	4.69E−03	6.38E−04
40.00	2.08E+00	1.36E+00	9.98E−02	1.45E−02	4.39E−03	2.24E−03	2.69E−04
45.00	1.53E+00	1.01E+00	7.54E−02	8.64E−03	2.29E−03	1.11E−03	1.24E−04
50.00	1.09E+00	7.38E−01	5.94E−02	5.16E−03	1.24E−03	5.77E−04	6.21E−05
55.00	7.67E−01	5.38E−01	4.75E−02	3.12E−03	6.91E−04	3.15E−04	3.41E−05
60.00	5.46E−01	3.95E−01	3.81E−02	1.92E−03	4.04E−04	1.81E−04	2.05E−05
65.00	3.97E−01	2.95E−01	3.06E−02	1.22E−03	2.47E−04	1.10E−04	1.34E−05
70.00	2.97E−01	2.25E−01	2.47E−02	8.05E−04	1.59E−04	7.13E−05	9.50E−06
75.00	2.30E−01	1.78E−01	2.00E−02	5.49E−04	1.08E−04	4.89E−05	7.28E−06
80.00	1.86E−01	1.45E−01	1.65E−02	3.91E−04	7.68E−05	3.55E−05	5.95E−06
85.00	1.56E−01	1.22E−01	1.38E−02	2.90E−04	5.77E−05	2.73E−05	5.15E−06
90.00	1.36E−01	1.07E−01	1.18E−02	2.25E−04	4.56E−05	2.21E−05	4.67E−06
95.00	1.23E−01	9.64E−02	1.02E−02	1.81E−04	3.77E−05	1.87E−05	4.39E−06
105.00	1.11E−01	8.59E−02	8.25E−03	1.30E−04	2.87E−05	1.49E−05	4.22E−06
120.00	1.11E−01	8.39E−02	6.75E−03	9.64E−05	2.30E−05	1.27E−05	4.43E−06
135.00	1.21E−01	8.91E−02	6.06E−03	8.19E−05	2.10E−05	1.21E−05	4.90E−06
150.00	1.32E−01	9.56E−02	5.72E−03	7.50E−05	2.03E−05	1.20E−05	5.39E−06
165.00	1.41E−01	1.01E−01	5.55E−03	7.19E−05	2.01E−05	1.21E−05	5.75E−06
180.00	1.44E−01	1.02E−01	5.50E−03	7.09E−05	2.00E−05	1.22E−05	5.89E−06
total	1.39E+01	1.07E+01	2.11E+00	4.71E−01	2.82E−01	2.19E−01	1.10E−01
rel ff	1.39E+01	1.04E+01	2.12E+00	4.76E−01	2.86E−01	2.22E−01	1.12E−01
nrl ff	1.40E+01	1.05E+01	2.14E+00	4.82E−01	2.89E−01	2.25E−01	1.13E−01

TABLE 1. Predicted *S*-matrix differential elastic scattering cross sections for photon energies (50.0, 59.54, 145.4, 316.5, 411.8, 468.1, 661.6, 778.9, 964.0, 1004.8, 1112.1, 1274.5, 1408.0 and 1500.0). The angle integrated total cross sections for each element and energies are presented. ''total'' represents total cross sections from this work, ''rel ff'' represents total cross sections calculated from the relativistic form factor and ''nrl ff'' represents total cross sections calculated from the nonrelativistic form factor—Continued[a]

θ (deg)	Photon energy (keV)						
	778.9	964.0	1004.8	1112.1	1274.5	1408.0	1500.0
Nickel ($Z=28$)							
0.00	6.19E+01	6.19E+01	6.19E+01	6.19E+01	6.19E+01	6.19E+01	6.19E+01
0.01	6.19E+01	6.18E+01	6.18E+01	6.18E+01	6.18E+01	6.17E+01	6.17E+01
0.02	6.18E+01	6.17E+01	6.17E+01	6.16E+01	6.15E+01	6.14E+01	6.13E+01
0.04	6.13E+01	6.10E+01	6.09E+01	6.07E+01	6.03E+01	6.00E+01	5.97E+01
0.06	6.06E+01	5.99E+01	5.97E+01	5.93E+01	5.85E+01	5.79E+01	5.75E+01
0.10	5.85E+01	5.69E+01	5.65E+01	5.55E+01	5.40E+01	5.27E+01	5.18E+01
0.20	5.12E+01	4.75E+01	4.67E+01	4.47E+01	4.17E+01	3.96E+01	3.82E+01
0.30	4.37E+01	3.88E+01	3.78E+01	3.52E+01	3.14E+01	2.85E+01	2.67E+01
0.40	3.70E+01	3.12E+01	3.00E+01	2.70E+01	2.30E+01	2.01E+01	1.82E+01
0.50	3.09E+01	2.47E+01	2.34E+01	2.05E+01	1.66E+01	1.40E+01	1.25E+01
0.60	2.56E+01	1.93E+01	1.82E+01	1.54E+01	1.21E+01	9.98E+00	8.80E+00
0.70	2.11E+01	1.51E+01	1.41E+01	1.17E+01	8.93E+00	7.34E+00	6.51E+00
0.80	1.73E+01	1.19E+01	1.10E+01	8.96E+00	6.79E+00	5.61E+00	5.04E+00
1.00	1.17E+01	7.63E+00	6.99E+00	5.66E+00	4.36E+00	3.77E+00	3.55E+00
1.20	8.19E+00	5.26E+00	4.83E+00	3.96E+00	3.17E+00	2.88E+00	2.83E+00
1.50	5.24E+00	3.50E+00	3.25E+00	2.75E+00	2.27E+00	2.03E+00	1.91E+00
1.70	4.14E+00	2.89E+00	2.71E+00	2.32E+00	1.87E+00	1.55E+00	1.34E+00
2.00	3.14E+00	2.29E+00	2.16E+00	1.84E+00	1.38E+00	9.91E−01	7.32E−01
2.50	2.21E+00	1.57E+00	1.46E+00	1.17E+00	7.68E−01	4.71E−01	3.03E−01
3.00	1.60E+00	1.00E+00	9.03E−01	6.76E−01	4.15E−01	2.59E−01	1.78E−01
3.50	1.14E+00	6.17E−01	5.41E−01	3.85E−01	2.40E−01	1.71E−01	1.40E−01
4.00	7.86E−01	3.86E−01	3.34E−01	2.35E−01	1.56E−01	1.31E−01	1.29E−01
5.00	3.82E−01	1.82E−01	1.58E−01	1.17E−01	9.09E−02	9.37E−02	1.11E−01
6.00	2.11E−01	1.14E−01	1.03E−01	8.19E−02	6.63E−02	6.24E−02	6.33E−02
7.00	1.37E−01	8.73E−02	8.09E−02	6.75E−02	5.07E−02	3.68E−02	2.72E−02
8.00	1.01E−01	7.07E−02	6.63E−02	5.55E−02	3.72E−02	2.14E−02	1.22E−02
9.00	7.97E−02	5.63E−02	5.25E−02	4.24E−02	2.58E−02	1.30E−02	6.60E−03
10.00	6.51E−02	4.33E−02	3.96E−02	3.03E−02	1.71E−02	8.31E−03	4.22E−03
12.50	3.92E−02	2.02E−02	1.73E−02	1.14E−02	5.73E−03	3.00E−03	1.82E−03
15.00	2.21E−02	9.02E−03	7.38E−03	4.36E−03	2.01E−03	1.11E−03	7.60E−04
17.50	1.19E−02	4.11E−03	3.25E−03	1.78E−03	7.65E−04	4.18E−04	2.94E−04
20.00	6.34E−03	1.94E−03	1.50E−03	7.81E−04	3.15E−04	1.66E−04	1.15E−04
22.50	3.41E−03	9.52E−04	7.25E−04	3.64E−04	1.40E−04	7.12E−05	4.78E−05
25.00	1.87E−03	4.87E−04	3.67E−04	1.80E−04	6.72E−05	3.32E−05	2.17E−05
27.50	1.05E−03	2.61E−04	1.95E−04	9.45E−05	3.48E−05	1.69E−05	1.09E−05
30.00	6.11E−04	1.46E−04	1.09E−04	5.26E−05	1.95E−05	9.53E−06	6.15E−06
35.00	2.23E−04	5.19E−05	3.89E−05	1.91E−05	7.43E−06	3.82E−06	2.55E−06
40.00	9.15E−05	2.19E−05	1.67E−05	8.70E−06	3.85E−06	2.25E−06	1.66E−06
45.00	4.24E−05	1.10E−05	8.64E−06	4.94E−06	2.61E−06	1.83E−06	1.54E−06
50.00	2.20E−05	6.44E−06	5.21E−06	3.28E−06	2.04E−06	1.63E−06	1.50E−06
55.00	1.28E−05	4.34E−06	3.65E−06	2.54E−06	1.82E−06	1.59E−06	1.52E−06
60.00	8.32E−06	3.32E−06	2.90E−06	2.22E−06	1.78E−06	1.61E−06	1.52E−06
65.00	5.92E−06	2.76E−06	2.49E−06	2.06E−06	1.77E−06	1.58E−06	1.41E−06
70.00	4.59E−06	2.48E−06	2.30E−06	2.03E−06	1.82E−06	1.58E−06	1.30E−06
75.00	3.82E−06	2.35E−06	2.24E−06	2.08E−06	1.91E−06	1.59E−06	1.23E−06
80.00	3.36E−06	2.28E−06	2.22E−06	2.14E−06	2.00E−06	1.61E−06	1.17E−06
85.00	3.09E−06	2.29E−06	2.25E−06	2.23E−06	2.11E−06	1.65E−06	1.15E−06
90.00	2.96E−06	2.34E−06	2.32E−06	2.35E−06	2.24E−06	1.72E−06	1.17E−06
95.00	2.91E−06	2.42E−06	2.42E−06	2.49E−06	2.38E−06	1.80E−06	1.21E−06
105.00	3.00E−06	2.67E−06	2.70E−06	2.81E−06	2.71E−06	2.04E−06	1.36E−06
120.00	3.38E−06	3.18E−06	3.23E−06	3.40E−06	3.29E−06	2.50E−06	1.69E−06
135.00	3.91E−06	3.80E−06	3.88E−06	4.10E−06	3.96E−06	3.02E−06	2.06E−06
150.00	4.42E−06	4.37E−06	4.47E−06	4.71E−06	4.56E−06	3.52E−06	2.44E−06
165.00	4.79E−06	4.78E−06	4.88E−06	5.15E−06	4.99E−06	3.88E−06	2.72E−06
180.00	4.93E−06	4.92E−06	5.03E−06	5.31E−06	5.16E−06	4.03E−06	2.84E−06
total	7.96E−02	5.22E−02	4.82E−02	3.94E−02	2.99E−02	2.42E−02	2.14E−02
rel ff	8.10E−02	5.30E−02	4.88E−02	3.98E−02	3.02E−02	2.48E−02	2.19E−02
nrl ff	8.20E−02	5.36E−02	4.94E−02	4.03E−02	3.06E−02	2.52E−02	2.22E−02

TABLE 1. Predicted *S*-matrix differential elastic scattering cross sections for photon energies (50.0, 59.54, 145.4, 316.5, 411.8, 468.1, 661.6, 778.9, 964.0, 1004.8, 1112.1, 1274.5, 1408.0 and 1500.0). The angle integrated total cross sections for each element and energies are presented. ''total'' represents total cross sections from this work, ''rel ff'' represents total cross sections calculated from the relativistic form factor and ''nrl ff'' represents total cross sections calculated from the nonrelativistic form factor—Continued[a]

θ (deg)	Photon energy (keV)						
	50.0	59.5	145.4	316.5	411.8	468.1	661.6
Copper ($Z=29$)							
0.00	6.71E+01	6.70E+01	6.66E+01	6.65E+01	6.64E+01	6.64E+01	6.64E+01
0.01	6.71E+01	6.70E+01	6.66E+01	6.64E+01	6.64E+01	6.64E+01	6.64E+01
0.02	6.71E+01	6.70E+01	6.65E+01	6.64E+01	6.64E+01	6.63E+01	6.63E+01
0.04	6.71E+01	6.70E+01	6.65E+01	6.63E+01	6.63E+01	6.62E+01	6.60E+01
0.06	6.71E+01	6.70E+01	6.65E+01	6.62E+01	6.61E+01	6.59E+01	6.54E+01
0.10	6.70E+01	6.70E+01	6.64E+01	6.58E+01	6.54E+01	6.51E+01	6.38E+01
0.20	6.70E+01	6.69E+01	6.60E+01	6.40E+01	6.26E+01	6.16E+01	5.78E+01
0.30	6.70E+01	6.68E+01	6.54E+01	6.15E+01	5.86E+01	5.69E+01	5.08E+01
0.40	6.69E+01	6.67E+01	6.45E+01	5.84E+01	5.43E+01	5.20E+01	4.44E+01
0.50	6.67E+01	6.64E+01	6.34E+01	5.51E+01	5.01E+01	4.73E+01	3.85E+01
0.60	6.65E+01	6.62E+01	6.22E+01	5.18E+01	4.61E+01	4.29E+01	3.30E+01
0.70	6.64E+01	6.60E+01	6.09E+01	4.86E+01	4.22E+01	3.87E+01	2.82E+01
0.80	6.61E+01	6.56E+01	5.95E+01	4.55E+01	3.86E+01	3.48E+01	2.40E+01
1.00	6.57E+01	6.49E+01	5.65E+01	3.97E+01	3.19E+01	2.79E+01	1.72E+01
1.20	6.51E+01	6.40E+01	5.34E+01	3.44E+01	2.62E+01	2.21E+01	1.24E+01
1.50	6.41E+01	6.25E+01	4.89E+01	2.74E+01	1.92E+01	1.56E+01	7.90E+00
1.70	6.32E+01	6.14E+01	4.61E+01	2.34E+01	1.56E+01	1.24E+01	6.12E+00
2.00	6.17E+01	5.96E+01	4.19E+01	1.85E+01	1.15E+01	8.99E+00	4.49E+00
2.50	5.91E+01	5.65E+01	3.57E+01	1.25E+01	7.32E+00	5.72E+00	3.12E+00
3.00	5.64E+01	5.33E+01	3.01E+01	8.74E+00	5.09E+00	4.04E+00	2.38E+00
3.50	5.38E+01	5.03E+01	2.52E+01	6.39E+00	3.87E+00	3.11E+00	1.83E+00
4.00	5.14E+01	4.73E+01	2.10E+01	4.91E+00	3.14E+00	2.53E+00	1.37E+00
5.00	4.71E+01	4.16E+01	1.45E+01	3.30E+00	2.25E+00	1.74E+00	7.30E−01
6.00	4.32E+01	3.64E+01	1.02E+01	2.46E+00	1.60E+00	1.17E+00	3.94E−01
7.00	3.92E+01	3.17E+01	7.46E+00	1.90E+00	1.10E+00	7.65E−01	2.35E−01
8.00	3.50E+01	2.74E+01	5.68E+00	1.47E+00	7.38E−01	4.99E−01	1.60E−01
9.00	3.07E+01	2.36E+01	4.54E+00	1.11E+00	4.98E−01	3.35E−01	1.22E−01
10.00	2.65E+01	2.03E+01	3.78E+00	8.34E−01	3.46E−01	2.35E−01	9.89E−02
12.50	1.76E+01	1.39E+01	2.67E+00	4.11E−01	1.71E−01	1.23E−01	6.50E−02
15.00	1.19E+01	9.74E+00	1.99E+00	2.24E−01	1.11E−01	8.28E−02	4.19E−02
17.50	8.44E+00	7.05E+00	1.46E+00	1.41E−01	8.31E−02	6.20E−02	2.58E−02
20.00	6.46E+00	5.35E+00	1.04E+00	1.01E−01	6.39E−02	4.66E−02	1.54E−02
22.50	5.29E+00	4.25E+00	7.23E−01	7.81E−02	4.86E−02	3.40E−02	9.17E−03
25.00	4.56E+00	3.51E+00	5.06E−01	6.30E−02	3.63E−02	2.42E−02	5.46E−03
27.50	4.06E+00	2.98E+00	3.60E−01	5.13E−02	2.66E−02	1.69E−02	3.29E−03
30.00	3.66E+00	2.58E+00	2.65E−01	4.17E−02	1.93E−02	1.17E−02	2.01E−03
35.00	2.97E+00	1.97E+00	1.59E−01	2.67E−02	1.00E−02	5.58E−03	7.87E−04
40.00	2.30E+00	1.50E+00	1.09E−01	1.65E−02	5.22E−03	2.71E−03	3.34E−04
45.00	1.70E+00	1.12E+00	8.22E−02	1.00E−02	2.76E−03	1.36E−03	1.54E−04
50.00	1.22E+00	8.25E−01	6.47E−02	6.08E−03	1.51E−03	7.11E−04	7.68E−05
55.00	8.69E−01	6.03E−01	5.18E−02	3.72E−03	8.49E−04	3.90E−04	4.19E−05
60.00	6.20E−01	4.44E−01	4.17E−02	2.32E−03	4.99E−04	2.25E−04	2.49E−05
65.00	4.50E−01	3.31E−01	3.37E−02	1.49E−03	3.06E−04	1.37E−04	1.61E−05
70.00	3.36E−01	2.53E−01	2.74E−02	9.85E−04	1.97E−04	8.84E−05	1.13E−05
75.00	2.60E−01	1.99E−01	2.24E−02	6.76E−04	1.34E−04	6.05E−05	8.61E−06
80.00	2.08E−01	1.62E−01	1.86E−02	4.83E−04	9.53E−05	4.38E−05	6.98E−06
85.00	1.74E−01	1.36E−01	1.56E−02	3.60E−04	7.16E−05	3.36E−05	5.99E−06
90.00	1.51E−01	1.19E−01	1.34E−02	2.79E−04	5.64E−05	2.71E−05	5.41E−06
95.00	1.36E−01	1.07E−01	1.18E−02	2.25E−04	4.65E−05	2.28E−05	5.06E−06
105.00	1.22E−01	9.50E−02	9.59E−03	1.62E−04	3.52E−05	1.80E−05	4.81E−06
120.00	1.21E−01	9.24E−02	7.95E−03	1.20E−04	2.80E−05	1.52E−05	5.01E−06
135.00	1.31E−01	9.79E−02	7.20E−03	1.02E−04	2.53E−05	1.43E−05	5.49E−06
150.00	1.44E−01	1.05E−01	6.83E−03	9.29E−05	2.43E−05	1.42E−05	6.01E−06
165.00	1.53E−01	1.10E−01	6.65E−03	8.88E−05	2.40E−05	1.42E−05	6.39E−06
180.00	1.56E−01	1.12E−01	6.60E−03	8.76E−05	2.39E−05	1.43E−05	6.54E−06
total	1.52E+01	1.18E+01	2.32E+00	5.17E−01	3.10E−01	2.40E−01	1.21E−01
rel ff	1.53E+01	1.14E+01	2.33E+00	5.26E−01	3.15E−01	2.45E−01	1.24E−01
nrl ff	1.55E+01	1.15E+01	2.36E+00	5.32E−01	3.20E−01	2.48E−01	1.25E−01

TABLE 1. Predicted *S*-matrix differential elastic scattering cross sections for photon energies (50.0, 59.54, 145.4, 316.5, 411.8, 468.1, 661.6, 778.9, 964.0, 1004.8, 1112.1, 1274.5, 1408.0 and 1500.0). The angle integrated total cross sections for each element and energies are presented. ''total'' represents total cross sections from this work, ''rel ff'' represents total cross sections calculated from the relativistic form factor and ''nrl ff'' represents total cross sections calculated from the nonrelativistic form factor—Continued[a]

θ (deg)	Photon energy (keV)						
	778.9	964.0	1004.8	1112.1	1274.5	1408.0	1500.0
Copper ($Z=29$)							
0.00	6.64E+01	6.64E+01	6.64E+01	6.64E+01	6.64E+01	6.64E+01	6.63E+01
0.01	6.63E+01	6.63E+01	6.63E+01	6.63E+01	6.62E+01	6.62E+01	6.62E+01
0.02	6.63E+01	6.62E+01	6.62E+01	6.61E+01	6.60E+01	6.58E+01	6.57E+01
0.04	6.58E+01	6.54E+01	6.54E+01	6.51E+01	6.47E+01	6.44E+01	6.42E+01
0.06	6.51E+01	6.43E+01	6.42E+01	6.37E+01	6.30E+01	6.23E+01	6.19E+01
0.10	6.29E+01	6.13E+01	6.09E+01	5.99E+01	5.82E+01	5.68E+01	5.59E+01
0.20	5.53E+01	5.14E+01	5.05E+01	4.83E+01	4.52E+01	4.29E+01	4.14E+01
0.30	4.73E+01	4.21E+01	4.10E+01	3.81E+01	3.41E+01	3.11E+01	2.91E+01
0.40	4.01E+01	3.39E+01	3.26E+01	2.95E+01	2.51E+01	2.19E+01	1.99E+01
0.50	3.36E+01	2.69E+01	2.56E+01	2.24E+01	1.82E+01	1.54E+01	1.37E+01
0.60	2.79E+01	2.12E+01	1.99E+01	1.69E+01	1.33E+01	1.09E+01	9.61E+00
0.70	2.30E+01	1.66E+01	1.54E+01	1.28E+01	9.78E+00	8.01E+00	7.08E+00
0.80	1.89E+01	1.30E+01	1.20E+01	9.82E+00	7.43E+00	6.11E+00	5.47E+00
1.00	1.28E+01	8.34E+00	7.64E+00	6.17E+00	4.75E+00	4.09E+00	3.86E+00
1.20	8.96E+00	5.73E+00	5.25E+00	4.30E+00	3.45E+00	3.13E+00	3.09E+00
1.50	5.71E+00	3.80E+00	3.53E+00	2.99E+00	2.47E+00	2.22E+00	2.11E+00
1.70	4.50E+00	3.14E+00	2.94E+00	2.52E+00	2.05E+00	1.72E+00	1.50E+00
2.00	3.41E+00	2.50E+00	2.36E+00	2.02E+00	1.52E+00	1.10E+00	8.22E−01
2.50	2.41E+00	1.73E+00	1.61E+00	1.30E+00	8.59E−01	5.27E−01	3.39E−01
3.00	1.76E+00	1.12E+00	1.01E+00	7.59E−01	4.65E−01	2.86E−01	1.94E−01
3.50	1.26E+00	6.92E−01	6.07E−01	4.34E−01	2.68E−01	1.87E−01	1.50E−01
4.00	8.76E−01	4.33E−01	3.74E−01	2.63E−01	1.73E−01	1.43E−01	1.38E−01
5.00	4.27E−01	2.01E−01	1.74E−01	1.28E−01	9.88E−02	1.02E−01	1.21E−01
6.00	2.34E−01	1.25E−01	1.12E−01	8.84E−02	7.16E−02	6.87E−02	7.15E−02
7.00	1.51E−01	9.45E−02	8.74E−02	7.28E−02	5.53E−02	4.12E−02	3.15E−02
8.00	1.10E−01	7.66E−02	7.19E−02	6.04E−02	4.12E−02	2.43E−02	1.43E−02
9.00	8.67E−02	6.15E−02	5.75E−02	4.69E−02	2.91E−02	1.50E−02	7.76E−03
10.00	7.08E−02	4.78E−02	4.39E−02	3.41E−02	1.96E−02	9.69E−03	4.96E−03
12.50	4.33E−02	2.30E−02	1.99E−02	1.34E−02	6.84E−03	3.57E−03	2.14E−03
15.00	2.50E−02	1.06E−02	8.73E−03	5.25E−03	2.46E−03	1.35E−03	9.11E−04
17.50	1.38E−02	4.93E−03	3.93E−03	2.18E−03	9.47E−04	5.17E−04	3.60E−04
20.00	7.49E−03	2.36E−03	1.84E−03	9.66E−04	3.94E−04	2.08E−04	1.43E−04
22.50	4.10E−03	1.17E−03	8.95E−04	4.53E−04	1.75E−04	8.90E−05	5.96E−05
25.00	2.28E−03	6.03E−04	4.56E−04	2.24E−04	8.38E−05	4.12E−05	2.69E−05
27.50	1.29E−03	3.24E−04	2.43E−04	1.17E−04	4.30E−05	2.08E−05	1.33E−05
30.00	7.54E−04	1.82E−04	1.36E−04	6.51E−05	2.38E−05	1.15E−05	7.38E−06
35.00	2.77E−04	6.42E−05	4.79E−05	2.32E−05	8.84E−06	4.45E−06	2.93E−06
40.00	1.14E−04	2.67E−05	2.02E−05	1.03E−05	4.43E−06	2.53E−06	1.84E−06
45.00	5.22E−05	1.32E−05	1.02E−05	5.72E−06	2.92E−06	2.00E−06	1.67E−06
50.00	2.68E−05	7.53E−06	6.04E−06	3.71E−06	2.23E−06	1.75E−06	1.61E−06
55.00	1.54E−05	4.98E−06	4.15E−06	2.81E−06	1.96E−06	1.71E−06	1.64E−06
60.00	9.86E−06	3.74E−06	3.24E−06	2.42E−06	1.89E−06	1.73E−06	1.66E−06
65.00	6.93E−06	3.07E−06	2.75E−06	2.22E−06	1.87E−06	1.70E−06	1.55E−06
70.00	5.31E−06	2.73E−06	2.52E−06	2.18E−06	1.93E−06	1.69E−06	1.44E−06
75.00	4.38E−06	2.57E−06	2.43E−06	2.22E−06	2.03E−06	1.71E−06	1.35E−06
80.00	3.82E−06	2.49E−06	2.40E−06	2.28E−06	2.12E−06	1.73E−06	1.29E−06
85.00	3.50E−06	2.49E−06	2.44E−06	2.38E−06	2.24E−06	1.77E−06	1.27E−06
90.00	3.34E−06	2.54E−06	2.52E−06	2.52E−06	2.39E−06	1.85E−06	1.28E−06
95.00	3.27E−06	2.63E−06	2.62E−06	2.66E−06	2.54E−06	1.94E−06	1.32E−06
105.00	3.34E−06	2.90E−06	2.92E−06	3.02E−06	2.90E−06	2.19E−06	1.47E−06
120.00	3.74E−06	3.44E−06	3.49E−06	3.66E−06	3.53E−06	2.68E−06	1.81E−06
135.00	4.30E−06	4.11E−06	4.19E−06	4.41E−06	4.25E−06	3.23E−06	2.19E−06
150.00	4.84E−06	4.72E−06	4.81E−06	5.07E−06	4.89E−06	3.75E−06	2.58E−06
165.00	5.24E−06	5.15E−06	5.26E−06	5.54E−06	5.35E−06	4.14E−06	2.88E−06
180.00	5.38E−06	5.31E−06	5.41E−06	5.71E−06	5.52E−06	4.29E−06	3.00E−06
total	8.74E−02	5.74E−02	5.29E−02	4.34E−02	3.28E−02	2.66E−02	2.36E−02
rel ff	8.95E−02	5.85E−02	5.39E−02	4.39E−02	3.34E−02	2.74E−02	2.42E−02
nrl ff	9.07E−02	5.93E−02	5.46E−02	4.45E−02	3.39E−02	2.78E−02	2.46E−02

TABLE 1. Predicted *S*-matrix differential elastic scattering cross sections for photon energies (50.0, 59.54, 145.4, 316.5, 411.8, 468.1, 661.6, 778.9, 964.0, 1004.8, 1112.1, 1274.5, 1408.0 and 1500.0). The angle integrated total cross sections for each element and energies are presented. ''total'' represents total cross sections from this work, ''rel ff'' represents total cross sections calculated from the relativistic form factor and ''nrl ff'' represents total cross sections calculated from the nonrelativistic form factor—Continued[a]

θ (deg)	Photon energy (keV)						
	50.0	59.5	145.4	316.5	411.8	468.1	661.6
Zinc ($Z=30$)							
0.00	7.18E+01	7.17E+01	7.12E+01	7.11E+01	7.11E+01	7.11E+01	7.11E+01
0.01	7.18E+01	7.17E+01	7.12E+01	7.11E+01	7.10E+01	7.10E+01	7.10E+01
0.02	7.18E+01	7.17E+01	7.12E+01	7.10E+01	7.10E+01	7.10E+01	7.09E+01
0.04	7.18E+01	7.17E+01	7.12E+01	7.10E+01	7.09E+01	7.09E+01	7.06E+01
0.06	7.18E+01	7.17E+01	7.11E+01	7.09E+01	7.07E+01	7.06E+01	7.01E+01
0.10	7.18E+01	7.17E+01	7.11E+01	7.05E+01	7.00E+01	6.97E+01	6.84E+01
0.20	7.17E+01	7.16E+01	7.07E+01	6.86E+01	6.71E+01	6.61E+01	6.21E+01
0.30	7.17E+01	7.15E+01	7.00E+01	6.60E+01	6.30E+01	6.12E+01	5.47E+01
0.40	7.16E+01	7.14E+01	6.91E+01	6.27E+01	5.85E+01	5.60E+01	4.78E+01
0.50	7.14E+01	7.11E+01	6.80E+01	5.93E+01	5.40E+01	5.10E+01	4.15E+01
0.60	7.12E+01	7.09E+01	6.68E+01	5.57E+01	4.96E+01	4.62E+01	3.57E+01
0.70	7.11E+01	7.06E+01	6.54E+01	5.23E+01	4.55E+01	4.18E+01	3.06E+01
0.80	7.08E+01	7.03E+01	6.39E+01	4.90E+01	4.16E+01	3.76E+01	2.60E+01
1.00	7.04E+01	6.95E+01	6.07E+01	4.28E+01	3.45E+01	3.02E+01	1.87E+01
1.20	6.98E+01	6.86E+01	5.74E+01	3.72E+01	2.84E+01	2.40E+01	1.35E+01
1.50	6.87E+01	6.71E+01	5.27E+01	2.97E+01	2.09E+01	1.70E+01	8.63E+00
1.70	6.79E+01	6.59E+01	4.96E+01	2.55E+01	1.70E+01	1.35E+01	6.68E+00
2.00	6.63E+01	6.41E+01	4.52E+01	2.01E+01	1.26E+01	9.83E+00	4.89E+00
2.50	6.35E+01	6.08E+01	3.86E+01	1.37E+01	8.01E+00	6.25E+00	3.39E+00
3.00	6.06E+01	5.74E+01	3.26E+01	9.56E+00	5.56E+00	4.40E+00	2.59E+00
3.50	5.79E+01	5.41E+01	2.73E+01	6.98E+00	4.21E+00	3.38E+00	2.00E+00
4.00	5.53E+01	5.10E+01	2.28E+01	5.36E+00	3.41E+00	2.75E+00	1.51E+00
5.00	5.07E+01	4.49E+01	1.59E+01	3.59E+00	2.44E+00	1.90E+00	8.11E−01
6.00	4.66E+01	3.94E+01	1.12E+01	2.68E+00	1.75E+00	1.29E+00	4.39E−01
7.00	4.24E+01	3.43E+01	8.16E+00	2.08E+00	1.21E+00	8.47E−01	2.61E−01
8.00	3.79E+01	2.98E+01	6.21E+00	1.61E+00	8.20E−01	5.55E−01	1.76E−01
9.00	3.33E+01	2.57E+01	4.95E+00	1.22E+00	5.55E−01	3.73E−01	1.33E−01
10.00	2.88E+01	2.21E+01	4.12E+00	9.23E−01	3.85E−01	2.62E−01	1.07E−01
12.50	1.93E+01	1.52E+01	2.91E+00	4.58E−01	1.89E−01	1.35E−01	7.04E−02
15.00	1.30E+01	1.07E+01	2.17E+00	2.49E−01	1.22E−01	9.00E−02	4.60E−02
17.50	9.23E+00	7.72E+00	1.60E+00	1.56E−01	9.00E−02	6.72E−02	2.89E−02
20.00	7.04E+00	5.85E+00	1.14E+00	1.10E−01	6.93E−02	5.08E−02	1.77E−02
22.50	5.75E+00	4.64E+00	8.04E−01	8.50E−02	5.31E−02	3.75E−02	1.07E−02
25.00	4.94E+00	3.82E+00	5.64E−01	6.84E−02	4.00E−02	2.71E−02	6.44E−03
27.50	4.39E+00	3.25E+00	4.02E−01	5.58E−02	2.98E−02	1.92E−02	3.92E−03
30.00	3.96E+00	2.81E+00	2.95E−01	4.56E−02	2.19E−02	1.35E−02	2.42E−03
35.00	3.22E+00	2.15E+00	1.76E−01	2.96E−02	1.16E−02	6.56E−03	9.61E−04
40.00	2.52E+00	1.64E+00	1.20E−01	1.87E−02	6.14E−03	3.24E−03	4.10E−04
45.00	1.88E+00	1.23E+00	8.97E−02	1.15E−02	3.30E−03	1.65E−03	1.89E−04
50.00	1.36E+00	9.13E−01	7.03E−02	7.09E−03	1.82E−03	8.67E−04	9.43E−05
55.00	9.75E−01	6.72E−01	5.63E−02	4.40E−03	1.03E−03	4.78E−04	5.12E−05
60.00	6.99E−01	4.96E−01	4.54E−02	2.77E−03	6.10E−04	2.77E−04	3.02E−05
65.00	5.09E−01	3.71E−01	3.69E−02	1.79E−03	3.76E−04	1.69E−04	1.94E−05
70.00	3.80E−01	2.83E−01	3.01E−02	1.19E−03	2.43E−04	1.09E−04	1.35E−05
75.00	2.93E−01	2.23E−01	2.48E−02	8.24E−04	1.65E−04	7.43E−05	1.02E−05
80.00	2.34E−01	1.81E−01	2.07E−02	5.91E−04	1.17E−04	5.38E−05	8.19E−06
85.00	1.95E−01	1.52E−01	1.76E−02	4.42E−04	8.81E−05	4.11E−05	6.99E−06
90.00	1.69E−01	1.32E−01	1.52E−02	3.44E−04	6.94E−05	3.30E−05	6.27E−06
95.00	1.52E−01	1.19E−01	1.34E−02	2.78E−04	5.71E−05	2.77E−05	5.83E−06
105.00	1.35E−01	1.05E−01	1.10E−02	2.01E−04	4.30E−05	2.18E−05	5.51E−06
120.00	1.33E−01	1.02E−01	9.26E−03	1.48E−04	3.40E−05	1.82E−05	5.67E−06
135.00	1.43E−01	1.08E−01	8.46E−03	1.25E−04	3.06E−05	1.70E−05	6.17E−06
150.00	1.56E−01	1.15E−01	8.07E−03	1.14E−04	2.92E−05	1.67E−05	6.71E−06
165.00	1.66E−01	1.21E−01	7.89E−03	1.09E−04	2.87E−05	1.67E−05	7.11E−06
180.00	1.69E−01	1.23E−01	7.83E−03	1.08E−04	2.86E−05	1.68E−05	7.26E−06
total	1.67E+01	1.28E+01	2.53E+00	5.66E−01	3.40E−01	2.63E−01	1.33E−01
rel ff	1.68E+01	1.25E+01	2.55E+00	5.76E−01	3.46E−01	2.69E−01	1.36E−01
nrl ff	1.69E+01	1.26E+01	2.58E+00	5.84E−01	3.51E−01	2.73E−01	1.38E−01

TABLE 1. Predicted *S*-matrix differential elastic scattering cross sections for photon energies (50.0, 59.54, 145.4, 316.5, 411.8, 468.1, 661.6, 778.9, 964.0, 1004.8, 1112.1, 1274.5, 1408.0 and 1500.0). The angle integrated total cross sections for each element and energies are presented. ''total'' represents total cross sections from this work, ''rel ff'' represents total cross sections calculated from the relativistic form factor and ''nrl ff'' represents total cross sections calculated from the nonrelativistic form factor—Continued[a]

θ (deg)	Photon energy (keV)						
	778.9	964.0	1004.8	1112.1	1274.5	1408.0	1500.0
Zinc ($Z=30$)							
0.00	7.11E+01	7.10E+01	7.10E+01	7.10E+01	7.10E+01	7.10E+01	7.10E+01
0.01	7.10E+01	7.09E+01	7.09E+01	7.09E+01	7.09E+01	7.09E+01	7.08E+01
0.02	7.09E+01	7.08E+01	7.08E+01	7.07E+01	7.06E+01	7.05E+01	7.03E+01
0.04	7.04E+01	7.01E+01	7.00E+01	6.97E+01	6.93E+01	6.90E+01	6.87E+01
0.06	6.97E+01	6.89E+01	6.87E+01	6.83E+01	6.75E+01	6.69E+01	6.64E+01
0.10	6.74E+01	6.58E+01	6.54E+01	6.43E+01	6.26E+01	6.11E+01	6.00E+01
0.20	5.95E+01	5.53E+01	5.44E+01	5.20E+01	4.87E+01	4.62E+01	4.46E+01
0.30	5.10E+01	4.54E+01	4.42E+01	4.12E+01	3.69E+01	3.37E+01	3.16E+01
0.40	4.33E+01	3.66E+01	3.53E+01	3.19E+01	2.73E+01	2.39E+01	2.17E+01
0.50	3.63E+01	2.92E+01	2.78E+01	2.43E+01	1.99E+01	1.68E+01	1.49E+01
0.60	3.02E+01	2.30E+01	2.17E+01	1.84E+01	1.45E+01	1.19E+01	1.05E+01
0.70	2.50E+01	1.81E+01	1.68E+01	1.40E+01	1.07E+01	8.75E+00	7.71E+00
0.80	2.06E+01	1.42E+01	1.32E+01	1.07E+01	8.12E+00	6.67E+00	5.95E+00
1.00	1.40E+01	9.12E+00	8.36E+00	6.75E+00	5.18E+00	4.46E+00	4.19E+00
1.20	9.80E+00	6.25E+00	5.73E+00	4.69E+00	3.75E+00	3.41E+00	3.36E+00
1.50	6.23E+00	4.14E+00	3.84E+00	3.24E+00	2.68E+00	2.42E+00	2.31E+00
1.70	4.91E+00	3.41E+00	3.19E+00	2.73E+00	2.22E+00	1.88E+00	1.65E+00
2.00	3.71E+00	2.71E+00	2.56E+00	2.19E+00	1.67E+00	1.22E+00	9.18E−01
2.50	2.62E+00	1.89E+00	1.76E+00	1.43E+00	9.51E−01	5.89E−01	3.81E−01
3.00	1.92E+00	1.23E+00	1.11E+00	8.44E−01	5.19E−01	3.18E−01	2.14E−01
3.50	1.38E+00	7.71E−01	6.78E−01	4.86E−01	2.99E−01	2.05E−01	1.61E−01
4.00	9.70E−01	4.84E−01	4.19E−01	2.94E−01	1.92E−01	1.55E−01	1.47E−01
5.00	4.76E−01	2.23E−01	1.93E−01	1.41E−01	1.08E−01	1.10E−01	1.30E−01
6.00	2.60E−01	1.36E−01	1.22E−01	9.56E−02	7.73E−02	7.50E−02	7.94E−02
7.00	1.66E−01	1.02E−01	9.44E−02	7.82E−02	5.99E−02	4.58E−02	3.61E−02
8.00	1.20E−01	8.26E−02	7.75E−02	6.51E−02	4.52E−02	2.76E−02	1.68E−02
9.00	9.41E−02	6.66E−02	6.23E−02	5.12E−02	3.25E−02	1.72E−02	9.15E−03
10.00	7.68E−02	5.23E−02	4.82E−02	3.79E−02	2.23E−02	1.12E−02	5.83E−03
12.50	4.75E−02	2.60E−02	2.27E−02	1.55E−02	8.07E−03	4.22E−03	2.50E−03
15.00	2.80E−02	1.23E−02	1.02E−02	6.26E−03	2.97E−03	1.62E−03	1.08E−03
17.50	1.58E−02	5.85E−03	4.69E−03	2.65E−03	1.16E−03	6.31E−04	4.35E−04
20.00	8.76E−03	2.84E−03	2.22E−03	1.18E−03	4.87E−04	2.57E−04	1.76E−04
22.50	4.87E−03	1.43E−03	1.09E−03	5.58E−04	2.18E−04	1.10E−04	7.38E−05
25.00	2.74E−03	7.40E−04	5.61E−04	2.77E−04	1.04E−04	5.10E−05	3.32E−05
27.50	1.57E−03	4.00E−04	3.00E−04	1.45E−04	5.30E−05	2.55E−05	1.63E−05
30.00	9.22E−04	2.24E−04	1.67E−04	8.01E−05	2.91E−05	1.39E−05	8.86E−06
35.00	3.41E−04	7.89E−05	5.87E−05	2.82E−05	1.05E−05	5.20E−06	3.38E−06
40.00	1.40E−04	3.25E−05	2.44E−05	1.23E−05	5.11E−06	2.85E−06	2.04E−06
45.00	6.39E−05	1.57E−05	1.21E−05	6.63E−06	3.27E−06	2.19E−06	1.81E−06
50.00	3.25E−05	8.83E−06	7.02E−06	4.20E−06	2.44E−06	1.89E−06	1.73E−06
55.00	1.85E−05	5.73E−06	4.72E−06	3.12E−06	2.11E−06	1.82E−06	1.77E−06
60.00	1.17E−05	4.24E−06	3.62E−06	2.64E−06	2.02E−06	1.85E−06	1.80E−06
65.00	8.12E−06	3.43E−06	3.04E−06	2.40E−06	1.99E−06	1.82E−06	1.70E−06
70.00	6.16E−06	3.02E−06	2.76E−06	2.34E−06	2.04E−06	1.82E−06	1.58E−06
75.00	5.03E−06	2.83E−06	2.65E−06	2.38E−06	2.15E−06	1.84E−06	1.49E−06
80.00	4.36E−06	2.73E−06	2.61E−06	2.44E−06	2.25E−06	1.86E−06	1.42E−06
85.00	3.97E−06	2.72E−06	2.64E−06	2.55E−06	2.38E−06	1.91E−06	1.39E−06
90.00	3.76E−06	2.77E−06	2.72E−06	2.69E−06	2.54E−06	1.99E−06	1.40E−06
95.00	3.67E−06	2.86E−06	2.84E−06	2.85E−06	2.71E−06	2.09E−06	1.44E−06
105.00	3.73E−06	3.14E−06	3.15E−06	3.24E−06	3.10E−06	2.36E−06	1.59E−06
120.00	4.14E−06	3.73E−06	3.77E−06	3.93E−06	3.78E−06	2.88E−06	1.95E−06
135.00	4.73E−06	4.44E−06	4.52E−06	4.73E−06	4.55E−06	3.46E−06	2.34E−06
150.00	5.31E−06	5.09E−06	5.18E−06	5.44E−06	5.23E−06	4.00E−06	2.75E−06
165.00	5.72E−06	5.55E−06	5.65E−06	5.94E−06	5.73E−06	4.41E−06	3.05E−06
180.00	5.87E−06	5.71E−06	5.82E−06	6.12E−06	5.91E−06	4.57E−06	3.18E−06
total	9.58E−02	6.28E−02	5.79E−02	4.75E−02	3.59E−02	2.91E−02	2.58E−02
rel ff	9.81E−02	6.42E−02	5.91E−02	4.82E−02	3.66E−02	3.01E−02	2.66E−02
nrl ff	9.96E−02	6.51E−02	6.00E−02	4.89E−02	3.72E−02	3.06E−02	2.70E−02

TABLE 1. Predicted *S*-matrix differential elastic scattering cross sections for photon energies (50.0, 59.54, 145.4, 316.5, 411.8, 468.1, 661.6, 778.9, 964.0, 1004.8, 1112.1, 1274.5, 1408.0 and 1500.0). The angle integrated total cross sections for each element and energies are presented. ''total'' represents total cross sections from this work, ''rel ff'' represents total cross sections calculated from the relativistic form factor and ''nrl ff'' represents total cross sections calculated from the nonrelativistic form factor—Continued[a]

θ (deg)	Photon energy (keV)						
	50.0	59.5	145.4	316.5	411.8	468.1	661.6
Gallium ($Z=31$)							
0.00	7.67E+01	7.66E+01	7.61E+01	7.59E+01	7.59E+01	7.59E+01	7.59E+01
0.01	7.67E+01	7.66E+01	7.60E+01	7.59E+01	7.58E+01	7.58E+01	7.58E+01
0.02	7.67E+01	7.66E+01	7.60E+01	7.58E+01	7.58E+01	7.58E+01	7.57E+01
0.04	7.67E+01	7.66E+01	7.60E+01	7.58E+01	7.57E+01	7.56E+01	7.53E+01
0.06	7.67E+01	7.66E+01	7.59E+01	7.56E+01	7.54E+01	7.53E+01	7.47E+01
0.10	7.67E+01	7.66E+01	7.59E+01	7.52E+01	7.47E+01	7.43E+01	7.29E+01
0.20	7.66E+01	7.65E+01	7.54E+01	7.31E+01	7.14E+01	7.03E+01	6.59E+01
0.30	7.66E+01	7.64E+01	7.47E+01	7.02E+01	6.69E+01	6.49E+01	5.79E+01
0.40	7.65E+01	7.62E+01	7.37E+01	6.66E+01	6.20E+01	5.93E+01	5.05E+01
0.50	7.63E+01	7.60E+01	7.24E+01	6.28E+01	5.71E+01	5.39E+01	4.38E+01
0.60	7.61E+01	7.57E+01	7.11E+01	5.90E+01	5.24E+01	4.88E+01	3.77E+01
0.70	7.59E+01	7.54E+01	6.95E+01	5.53E+01	4.80E+01	4.41E+01	3.24E+01
0.80	7.56E+01	7.50E+01	6.79E+01	5.18E+01	4.39E+01	3.97E+01	2.77E+01
1.00	7.51E+01	7.42E+01	6.44E+01	4.51E+01	3.65E+01	3.20E+01	2.02E+01
1.20	7.45E+01	7.31E+01	6.09E+01	3.92E+01	3.01E+01	2.57E+01	1.49E+01
1.50	7.32E+01	7.14E+01	5.57E+01	3.15E+01	2.25E+01	1.85E+01	9.79E+00
1.70	7.23E+01	7.02E+01	5.24E+01	2.71E+01	1.85E+01	1.49E+01	7.64E+00
2.00	7.06E+01	6.81E+01	4.78E+01	2.17E+01	1.40E+01	1.10E+01	5.56E+00
2.50	6.76E+01	6.45E+01	4.07E+01	1.51E+01	9.11E+00	7.12E+00	3.71E+00
3.00	6.45E+01	6.09E+01	3.44E+01	1.07E+01	6.35E+00	4.98E+00	2.71E+00
3.50	6.16E+01	5.73E+01	2.90E+01	7.94E+00	4.74E+00	3.74E+00	2.06E+00
4.00	5.87E+01	5.39E+01	2.44E+01	6.09E+00	3.73E+00	2.95E+00	1.57E+00
5.00	5.34E+01	4.74E+01	1.73E+01	3.98E+00	2.55E+00	1.98E+00	8.96E−01
6.00	4.86E+01	4.16E+01	1.25E+01	2.87E+00	1.81E+00	1.35E+00	5.05E−01
7.00	4.39E+01	3.63E+01	9.27E+00	2.18E+00	1.29E+00	9.18E−01	3.03E−01
8.00	3.93E+01	3.15E+01	7.10E+00	1.67E+00	9.05E−01	6.23E−01	2.01E−01
9.00	3.48E+01	2.74E+01	5.64E+00	1.29E+00	6.31E−01	4.29E−01	1.47E−01
10.00	3.05E+01	2.37E+01	4.62E+00	9.92E−01	4.46E−01	3.03E−01	1.15E−01
12.50	2.14E+01	1.67E+01	3.11E+00	5.18E−01	2.17E−01	1.52E−01	7.33E−02
15.00	1.50E+01	1.20E+01	2.25E+00	2.87E−01	1.33E−01	9.69E−02	4.89E−02
17.50	1.08E+01	8.80E+00	1.66E+00	1.77E−01	9.48E−02	7.02E−02	3.17E−02
20.00	8.21E+00	6.69E+00	1.22E+00	1.22E−01	7.21E−02	5.29E−02	2.00E−02
22.50	6.58E+00	5.28E+00	8.85E−01	9.17E−02	5.57E−02	3.98E−02	1.23E−02
25.00	5.51E+00	4.29E+00	6.38E−01	7.23E−02	4.28E−02	2.94E−02	7.57E−03
27.50	4.75E+00	3.57E+00	4.64E−01	5.85E−02	3.25E−02	2.14E−02	4.67E−03
30.00	4.18E+00	3.03E+00	3.43E−01	4.78E−02	2.43E−02	1.53E−02	2.91E−03
35.00	3.29E+00	2.25E+00	2.03E−01	3.18E−02	1.33E−02	7.70E−03	1.18E−03
40.00	2.57E+00	1.70E+00	1.35E−01	2.06E−02	7.20E−03	3.88E−03	5.06E−04
45.00	1.96E+00	1.29E+00	9.75E−02	1.31E−02	3.93E−03	2.00E−03	2.35E−04
50.00	1.47E+00	9.77E−01	7.46E−02	8.22E−03	2.19E−03	1.06E−03	1.17E−04
55.00	1.08E+00	7.36E−01	5.90E−02	5.18E−03	1.26E−03	5.89E−04	6.33E−05
60.00	7.99E−01	5.55E−01	4.76E−02	3.31E−03	7.48E−04	3.42E−04	3.71E−05
65.00	5.93E−01	4.23E−01	3.88E−02	2.16E−03	4.63E−04	2.09E−04	2.36E−05
70.00	4.49E−01	3.27E−01	3.20E−02	1.45E−03	3.00E−04	1.35E−04	1.63E−05
75.00	3.48E−01	2.59E−01	2.66E−02	1.01E−03	2.04E−04	9.21E−05	1.21E−05
80.00	2.79E−01	2.11E−01	2.25E−02	7.26E−04	1.45E−04	6.64E−05	9.68E−06
85.00	2.32E−01	1.77E−01	1.93E−02	5.44E−04	1.09E−04	5.06E−05	8.19E−06
90.00	1.99E−01	1.54E−01	1.68E−02	4.24E−04	8.59E−05	4.06E−05	7.28E−06
95.00	1.78E−01	1.38E−01	1.50E−02	3.44E−04	7.05E−05	3.40E−05	6.73E−06
105.00	1.55E−01	1.20E−01	1.25E−02	2.49E−04	5.30E−05	2.65E−05	6.27E−06
120.00	1.48E−01	1.14E−01	1.07E−02	1.84E−04	4.16E−05	2.19E−05	6.37E−06
135.00	1.57E−01	1.19E−01	9.88E−03	1.55E−04	3.71E−05	2.03E−05	6.85E−06
150.00	1.69E−01	1.26E−01	9.49E−03	1.41E−04	3.52E−05	1.98E−05	7.40E−06
165.00	1.78E−01	1.32E−01	9.31E−03	1.35E−04	3.44E−05	1.97E−05	7.82E−06
180.00	1.82E−01	1.34E−01	9.26E−03	1.33E−04	3.42E−05	1.97E−05	7.97E−06
total	1.81E+01	1.40E+01	2.76E+00	6.17E−01	3.70E−01	2.86E−01	1.45E−01
rel ff	1.83E+01	1.36E+01	2.79E+00	6.29E−01	3.78E−01	2.94E−01	1.48E−01
nrl ff	1.85E+01	1.37E+01	2.82E+00	6.39E−01	3.84E−01	2.98E−01	1.51E−01

TABLE 1. Predicted *S*-matrix differential elastic scattering cross sections for photon energies (50.0, 59.54, 145.4, 316.5, 411.8, 468.1, 661.6, 778.9, 964.0, 1004.8, 1112.1, 1274.5, 1408.0 and 1500.0). The angle integrated total cross sections for each element and energies are presented. ''total'' represents total cross sections from this work, ''rel ff'' represents total cross sections calculated from the relativistic form factor and ''nrl ff'' represents total cross sections calculated from the nonrelativistic form factor—Continued[a]

θ (deg)	Photon energy (keV)						
	778.9	964.0	1004.8	1112.1	1274.5	1408.0	1500.0
Gallium ($Z=31$)							
0.00	7.58E+01	7.58E+01	7.58E+01	7.58E+01	7.58E+01	7.58E+01	7.58E+01
0.01	7.58E+01	7.57E+01	7.57E+01	7.57E+01	7.57E+01	7.56E+01	7.56E+01
0.02	7.57E+01	7.56E+01	7.56E+01	7.55E+01	7.53E+01	7.52E+01	7.50E+01
0.04	7.51E+01	7.48E+01	7.47E+01	7.44E+01	7.40E+01	7.35E+01	7.32E+01
0.06	7.43E+01	7.35E+01	7.33E+01	7.27E+01	7.19E+01	7.12E+01	7.07E+01
0.10	7.18E+01	6.99E+01	6.95E+01	6.83E+01	6.64E+01	6.48E+01	6.37E+01
0.20	6.30E+01	5.85E+01	5.75E+01	5.50E+01	5.14E+01	4.88E+01	4.71E+01
0.30	5.39E+01	4.79E+01	4.66E+01	4.34E+01	3.89E+01	3.55E+01	3.34E+01
0.40	4.56E+01	3.86E+01	3.72E+01	3.37E+01	2.89E+01	2.55E+01	2.33E+01
0.50	3.83E+01	3.09E+01	2.94E+01	2.59E+01	2.14E+01	1.83E+01	1.64E+01
0.60	3.20E+01	2.46E+01	2.32E+01	1.99E+01	1.59E+01	1.33E+01	1.18E+01
0.70	2.66E+01	1.96E+01	1.83E+01	1.54E+01	1.20E+01	9.93E+00	8.83E+00
0.80	2.22E+01	1.57E+01	1.45E+01	1.20E+01	9.23E+00	7.62E+00	6.80E+00
1.00	1.54E+01	1.03E+01	9.51E+00	7.74E+00	5.92E+00	4.99E+00	4.56E+00
1.20	1.10E+01	7.17E+00	6.59E+00	5.37E+00	4.19E+00	3.65E+00	3.44E+00
1.50	7.11E+00	4.66E+00	4.31E+00	3.57E+00	2.85E+00	2.48E+00	2.31E+00
1.70	5.57E+00	3.74E+00	3.47E+00	2.90E+00	2.30E+00	1.94E+00	1.73E+00
2.00	4.11E+00	2.85E+00	2.66E+00	2.23E+00	1.71E+00	1.33E+00	1.07E+00
2.50	2.78E+00	1.93E+00	1.79E+00	1.46E+00	1.02E+00	6.92E−01	4.94E−01
3.00	2.00E+00	1.30E+00	1.18E+00	9.18E−01	5.89E−01	3.74E−01	2.57E−01
3.50	1.45E+00	8.59E−01	7.66E−01	5.65E−01	3.51E−01	2.30E−01	1.68E−01
4.00	1.05E+00	5.61E−01	4.92E−01	3.53E−01	2.25E−01	1.64E−01	1.37E−01
5.00	5.41E−01	2.61E−01	2.26E−01	1.64E−01	1.19E−01	1.11E−01	1.20E−01
6.00	3.00E−01	1.52E−01	1.35E−01	1.03E−01	8.07E−02	7.81E−02	8.42E−02
7.00	1.88E−01	1.08E−01	9.85E−02	7.94E−02	6.13E−02	5.09E−02	4.47E−02
8.00	1.32E−01	8.48E−02	7.86E−02	6.50E−02	4.69E−02	3.21E−02	2.24E−02
9.00	1.01E−01	6.83E−02	6.36E−02	5.22E−02	3.47E−02	2.03E−02	1.20E−02
10.00	8.08E−02	5.47E−02	5.05E−02	4.03E−02	2.47E−02	1.31E−02	7.16E−03
12.50	5.01E−02	2.91E−02	2.57E−02	1.82E−02	9.60E−03	4.83E−03	2.69E−03
15.00	3.06E−02	1.43E−02	1.20E−02	7.59E−03	3.63E−03	1.90E−03	1.19E−03
17.50	1.79E−02	6.94E−03	5.62E−03	3.23E−03	1.43E−03	7.67E−04	5.15E−04
20.00	1.02E−02	3.42E−03	2.69E−03	1.45E−03	6.04E−04	3.19E−04	2.19E−04
22.50	5.78E−03	1.73E−03	1.34E−03	6.87E−04	2.71E−04	1.39E−04	9.40E−05
25.00	3.30E−03	9.09E−04	6.90E−04	3.43E−04	1.29E−04	6.43E−05	4.25E−05
27.50	1.91E−03	4.94E−04	3.71E−04	1.80E−04	6.60E−05	3.20E−05	2.06E−05
30.00	1.13E−03	2.78E−04	2.08E−04	9.94E−05	3.60E−05	1.73E−05	1.11E−05
35.00	4.23E−04	9.79E−05	7.28E−05	3.47E−05	1.28E−05	6.22E−06	4.01E−06
40.00	1.74E−04	4.00E−05	3.00E−05	1.49E−05	5.98E−06	3.23E−06	2.26E−06
45.00	7.93E−05	1.91E−05	1.46E−05	7.82E−06	3.70E−06	2.37E−06	1.90E−06
50.00	4.00E−05	1.05E−05	8.28E−06	4.82E−06	2.68E−06	1.99E−06	1.78E−06
55.00	2.25E−05	6.67E−06	5.43E−06	3.49E−06	2.26E−06	1.91E−06	1.83E−06
60.00	1.40E−05	4.82E−06	4.07E−06	2.88E−06	2.13E−06	1.94E−06	1.91E−06
65.00	9.60E−06	3.83E−06	3.35E−06	2.57E−06	2.08E−06	1.92E−06	1.84E−06
70.00	7.18E−06	3.32E−06	2.99E−06	2.47E−06	2.13E−06	1.93E−06	1.74E−06
75.00	5.80E−06	3.07E−06	2.85E−06	2.49E−06	2.24E−06	1.97E−06	1.67E−06
80.00	4.97E−06	2.94E−06	2.78E−06	2.55E−06	2.34E−06	2.00E−06	1.60E−06
85.00	4.49E−06	2.92E−06	2.81E−06	2.66E−06	2.49E−06	2.06E−06	1.56E−06
90.00	4.23E−06	2.97E−06	2.89E−06	2.82E−06	2.66E−06	2.15E−06	1.57E−06
95.00	4.10E−06	3.06E−06	3.01E−06	2.99E−06	2.84E−06	2.25E−06	1.60E−06
105.00	4.13E−06	3.36E−06	3.35E−06	3.41E−06	3.27E−06	2.54E−06	1.76E−06
120.00	4.53E−06	3.97E−06	4.01E−06	4.16E−06	4.01E−06	3.09E−06	2.11E−06
135.00	5.14E−06	4.74E−06	4.80E−06	5.02E−06	4.84E−06	3.69E−06	2.50E−06
150.00	5.73E−06	5.42E−06	5.51E−06	5.78E−06	5.57E−06	4.26E−06	2.91E−06
165.00	6.17E−06	5.91E−06	6.02E−06	6.32E−06	6.10E−06	4.68E−06	3.21E−06
180.00	6.32E−06	6.08E−06	6.20E−06	6.52E−06	6.30E−06	4.85E−06	3.34E−06
total	1.04E−01	6.84E−02	6.30E−02	5.16E−02	3.91E−02	3.17E−02	2.79E−02
rel ff	1.07E−01	7.02E−02	6.46E−02	5.27E−02	4.01E−02	3.29E−02	2.91E−02
nrl ff	1.09E−01	7.13E−02	6.57E−02	5.35E−02	4.07E−02	3.35E−02	2.95E−02

TABLE 1. Predicted *S*-matrix differential elastic scattering cross sections for photon energies (50.0, 59.54, 145.4, 316.5, 411.8, 468.1, 661.6, 778.9, 964.0, 1004.8, 1112.1, 1274.5, 1408.0 and 1500.0). The angle integrated total cross sections for each element and energies are presented. ''total'' represents total cross sections from this work, ''rel ff'' represents total cross sections calculated from the relativistic form factor and ''nrl ff'' represents total cross sections calculated from the nonrelativistic form factor—Continued[a]

θ (deg)	Photon energy (keV)						
	50.0	59.5	145.4	316.5	411.8	468.1	661.6
Germanium ($Z=32$)							
0.00	8.18E+01	8.17E+01	8.10E+01	8.08E+01	8.08E+01	8.08E+01	8.08E+01
0.01	8.18E+01	8.17E+01	8.10E+01	8.08E+01	8.08E+01	8.08E+01	8.07E+01
0.02	8.18E+01	8.17E+01	8.10E+01	8.08E+01	8.07E+01	8.07E+01	8.06E+01
0.04	8.18E+01	8.17E+01	8.09E+01	8.07E+01	8.06E+01	8.06E+01	8.02E+01
0.06	8.18E+01	8.17E+01	8.09E+01	8.06E+01	8.03E+01	8.02E+01	7.96E+01
0.10	8.17E+01	8.16E+01	8.09E+01	8.00E+01	7.95E+01	7.91E+01	7.75E+01
0.20	8.17E+01	8.15E+01	8.03E+01	7.78E+01	7.59E+01	7.46E+01	6.99E+01
0.30	8.16E+01	8.14E+01	7.95E+01	7.45E+01	7.10E+01	6.88E+01	6.13E+01
0.40	8.15E+01	8.12E+01	7.84E+01	7.06E+01	6.56E+01	6.28E+01	5.33E+01
0.50	8.13E+01	8.09E+01	7.70E+01	6.65E+01	6.04E+01	5.69E+01	4.61E+01
0.60	8.11E+01	8.07E+01	7.55E+01	6.24E+01	5.54E+01	5.15E+01	3.98E+01
0.70	8.09E+01	8.03E+01	7.38E+01	5.85E+01	5.07E+01	4.65E+01	3.42E+01
0.80	8.06E+01	7.98E+01	7.20E+01	5.47E+01	4.63E+01	4.19E+01	2.94E+01
1.00	8.00E+01	7.89E+01	6.83E+01	4.76E+01	3.85E+01	3.39E+01	2.18E+01
1.20	7.93E+01	7.78E+01	6.45E+01	4.13E+01	3.19E+01	2.74E+01	1.64E+01
1.50	7.79E+01	7.59E+01	5.89E+01	3.33E+01	2.41E+01	2.00E+01	1.10E+01
1.70	7.68E+01	7.45E+01	5.54E+01	2.88E+01	2.01E+01	1.64E+01	8.65E+00
2.00	7.50E+01	7.23E+01	5.04E+01	2.33E+01	1.54E+01	1.23E+01	6.27E+00
2.50	7.19E+01	6.84E+01	4.29E+01	1.65E+01	1.03E+01	8.04E+00	4.05E+00
3.00	6.86E+01	6.45E+01	3.63E+01	1.20E+01	7.19E+00	5.58E+00	2.86E+00
3.50	6.54E+01	6.07E+01	3.08E+01	8.94E+00	5.29E+00	4.11E+00	2.14E+00
4.00	6.22E+01	5.70E+01	2.61E+01	6.87E+00	4.08E+00	3.18E+00	1.65E+00
5.00	5.63E+01	5.01E+01	1.89E+01	4.40E+00	2.67E+00	2.06E+00	9.84E−01
6.00	5.08E+01	4.39E+01	1.39E+01	3.08E+00	1.89E+00	1.42E+00	5.76E−01
7.00	4.56E+01	3.83E+01	1.04E+01	2.29E+00	1.37E+00	9.91E−01	3.48E−01
8.00	4.08E+01	3.34E+01	8.05E+00	1.75E+00	9.93E−01	6.95E−01	2.27E−01
9.00	3.63E+01	2.91E+01	6.36E+00	1.36E+00	7.11E−01	4.88E−01	1.62E−01
10.00	3.22E+01	2.54E+01	5.16E+00	1.07E+00	5.10E−01	3.47E−01	1.24E−01
12.50	2.34E+01	1.82E+01	3.33E+00	5.81E−01	2.46E−01	1.71E−01	7.65E−02
15.00	1.70E+01	1.33E+01	2.35E+00	3.28E−01	1.45E−01	1.05E−01	5.19E−02
17.50	1.25E+01	9.93E+00	1.73E+00	2.01E−01	1.00E−01	7.37E−02	3.47E−02
20.00	9.47E+00	7.59E+00	1.30E+00	1.35E−01	7.53E−02	5.53E−02	2.24E−02
22.50	7.47E+00	5.95E+00	9.68E−01	9.90E−02	5.86E−02	4.22E−02	1.41E−02
25.00	6.11E+00	4.78E+00	7.16E−01	7.68E−02	4.57E−02	3.19E−02	8.81E−03
27.50	5.15E+00	3.92E+00	5.29E−01	6.16E−02	3.53E−02	2.37E−02	5.51E−03
30.00	4.43E+00	3.27E+00	3.94E−01	5.03E−02	2.69E−02	1.73E−02	3.47E−03
35.00	3.39E+00	2.37E+00	2.32E−01	3.40E−02	1.51E−02	8.93E−03	1.42E−03
40.00	2.64E+00	1.78E+00	1.50E−01	2.26E−02	8.36E−03	4.58E−03	6.19E−04
45.00	2.05E+00	1.36E+00	1.06E−01	1.47E−02	4.64E−03	2.39E−03	2.88E−04
50.00	1.57E+00	1.04E+00	7.95E−02	9.42E−03	2.62E−03	1.29E−03	1.44E−04
55.00	1.20E+00	8.03E−01	6.21E−02	6.03E−03	1.52E−03	7.18E−04	7.76E−05
60.00	9.03E−01	6.18E−01	4.99E−02	3.91E−03	9.08E−04	4.19E−04	4.53E−05
65.00	6.84E−01	4.78E−01	4.09E−02	2.57E−03	5.65E−04	2.57E−04	2.86E−05
70.00	5.23E−01	3.74E−01	3.39E−02	1.74E−03	3.67E−04	1.66E−04	1.96E−05
75.00	4.09E−01	2.98E−01	2.85E−02	1.22E−03	2.50E−04	1.13E−04	1.45E−05
80.00	3.28E−01	2.43E−01	2.43E−02	8.81E−04	1.79E−04	8.15E−05	1.14E−05
85.00	2.72E−01	2.04E−01	2.10E−02	6.63E−04	1.34E−04	6.20E−05	9.59E−06
90.00	2.33E−01	1.77E−01	1.85E−02	5.18E−04	1.05E−04	4.95E−05	8.46E−06
95.00	2.06E−01	1.58E−01	1.66E−02	4.21E−04	8.65E−05	4.14E−05	7.77E−06
105.00	1.77E−01	1.36E−01	1.41E−02	3.05E−04	6.48E−05	3.21E−05	7.16E−06
120.00	1.66E−01	1.27E−01	1.22E−02	2.26E−04	5.05E−05	2.63E−05	7.17E−06
135.00	1.72E−01	1.31E−01	1.14E−02	1.91E−04	4.48E−05	2.41E−05	7.64E−06
150.00	1.83E−01	1.38E−01	1.11E−02	1.73E−04	4.23E−05	2.34E−05	8.19E−06
165.00	1.92E−01	1.43E−01	1.09E−02	1.65E−04	4.12E−05	2.32E−05	8.62E−06
180.00	1.95E−01	1.46E−01	1.08E−02	1.63E−04	4.09E−05	2.32E−05	8.78E−06
total	1.97E+01	1.52E+01	3.00E+00	6.70E−01	4.02E−01	3.12E−01	1.57E−01
rel ff	1.98E+01	1.48E+01	3.03E+00	6.85E−01	4.12E−01	3.20E−01	1.62E−01
nrl ff	2.01E+01	1.49E+01	3.07E+00	6.96E−01	4.18E−01	3.26E−01	1.64E−01

TABLE 1. Predicted *S*-matrix differential elastic scattering cross sections for photon energies (50.0, 59.54, 145.4, 316.5, 411.8, 468.1, 661.6, 778.9, 964.0, 1004.8, 1112.1, 1274.5, 1408.0 and 1500.0). The angle integrated total cross sections for each element and energies are presented. ''total'' represents total cross sections from this work, ''rel ff'' represents total cross sections calculated from the relativistic form factor and ''nrl ff'' represents total cross sections calculated from the nonrelativistic form factor—Continued[a]

θ (deg)	Photon energy (keV)						
	778.9	964.0	1004.8	1112.1	1274.5	1408.0	1500.0
Germanium ($Z=32$)							
0.00	8.08E+01	8.08E+01	8.08E+01	8.08E+01	8.07E+01	8.07E+01	8.07E+01
0.01	8.07E+01	8.07E+01	8.07E+01	8.06E+01	8.06E+01	8.06E+01	8.06E+01
0.02	8.06E+01	8.05E+01	8.05E+01	8.04E+01	8.02E+01	8.00E+01	7.98E+01
0.04	8.00E+01	7.96E+01	7.95E+01	7.92E+01	7.87E+01	7.82E+01	7.78E+01
0.06	7.91E+01	7.81E+01	7.79E+01	7.73E+01	7.64E+01	7.56E+01	7.51E+01
0.10	7.63E+01	7.43E+01	7.38E+01	7.25E+01	7.04E+01	6.87E+01	6.76E+01
0.20	6.68E+01	6.19E+01	6.09E+01	5.82E+01	5.43E+01	5.14E+01	4.96E+01
0.30	5.69E+01	5.05E+01	4.92E+01	4.58E+01	4.10E+01	3.75E+01	3.53E+01
0.40	4.81E+01	4.07E+01	3.93E+01	3.56E+01	3.07E+01	2.72E+01	2.50E+01
0.50	4.04E+01	3.27E+01	3.12E+01	2.76E+01	2.30E+01	1.98E+01	1.80E+01
0.60	3.39E+01	2.62E+01	2.48E+01	2.15E+01	1.74E+01	1.47E+01	1.33E+01
0.70	2.83E+01	2.11E+01	1.98E+01	1.68E+01	1.33E+01	1.12E+01	1.00E+01
0.80	2.38E+01	1.71E+01	1.60E+01	1.34E+01	1.04E+01	8.63E+00	7.69E+00
1.00	1.69E+01	1.16E+01	1.07E+01	8.79E+00	6.71E+00	5.55E+00	4.95E+00
1.20	1.23E+01	8.15E+00	7.49E+00	6.10E+00	4.67E+00	3.91E+00	3.55E+00
1.50	8.03E+00	5.22E+00	4.80E+00	3.92E+00	3.03E+00	2.57E+00	2.34E+00
1.70	6.27E+00	4.09E+00	3.77E+00	3.09E+00	2.40E+00	2.02E+00	1.81E+00
2.00	4.54E+00	3.01E+00	2.78E+00	2.30E+00	1.77E+00	1.43E+00	1.23E+00
2.50	2.95E+00	1.98E+00	1.83E+00	1.50E+00	1.09E+00	8.01E−01	6.24E−01
3.00	2.09E+00	1.37E+00	1.26E+00	9.94E−01	6.62E−01	4.36E−01	3.06E−01
3.50	1.53E+00	9.49E−01	8.57E−01	6.49E−01	4.07E−01	2.57E−01	1.77E−01
4.00	1.13E+00	6.43E−01	5.70E−01	4.18E−01	2.61E−01	1.76E−01	1.32E−01
5.00	6.10E−01	3.02E−01	2.63E−01	1.89E−01	1.31E−01	1.13E−01	1.13E−01
6.00	3.43E−01	1.70E−01	1.49E−01	1.11E−01	8.47E−02	8.15E−02	8.87E−02
7.00	2.12E−01	1.15E−01	1.03E−01	8.14E−02	6.31E−02	5.61E−02	5.39E−02
8.00	1.45E−01	8.77E−02	8.04E−02	6.54E−02	4.87E−02	3.68E−02	2.89E−02
9.00	1.08E−01	7.04E−02	6.52E−02	5.34E−02	3.70E−02	2.36E−02	1.54E−02
10.00	8.53E−02	5.72E−02	5.30E−02	4.27E−02	2.72E−02	1.52E−02	8.70E−03
12.50	5.29E−02	3.22E−02	2.88E−02	2.10E−02	1.13E−02	5.52E−03	2.92E−03
15.00	3.32E−02	1.64E−02	1.40E−02	9.06E−03	4.38E−03	2.22E−03	1.31E−03
17.50	2.01E−02	8.14E−03	6.65E−03	3.90E−03	1.75E−03	9.22E−04	6.03E−04
20.00	1.17E−02	4.07E−03	3.22E−03	1.76E−03	7.41E−04	3.93E−04	2.68E−04
22.50	6.77E−03	2.09E−03	1.62E−03	8.39E−04	3.34E−04	1.73E−04	1.18E−04
25.00	3.92E−03	1.10E−03	8.41E−04	4.20E−04	1.60E−04	8.03E−05	5.35E−05
27.50	2.30E−03	6.04E−04	4.55E−04	2.21E−04	8.16E−05	3.98E−05	2.59E−05
30.00	1.37E−03	3.42E−04	2.55E−04	1.22E−04	4.43E−05	2.13E−05	1.37E−05
35.00	5.18E−04	1.21E−04	8.95E−05	4.25E−05	1.54E−05	7.42E−06	4.74E−06
40.00	2.14E−04	4.90E−05	3.66E−05	1.79E−05	7.00E−06	3.68E−06	2.52E−06
45.00	9.75E−05	2.31E−05	1.76E−05	9.20E−06	4.19E−06	2.59E−06	2.02E−06
50.00	4.89E−05	1.25E−05	9.74E−06	5.53E−06	2.94E−06	2.11E−06	1.84E−06
55.00	2.72E−05	7.76E−06	6.25E−06	3.90E−06	2.43E−06	2.00E−06	1.91E−06
60.00	1.67E−05	5.49E−06	4.58E−06	3.15E−06	2.26E−06	2.04E−06	2.03E−06
65.00	1.13E−05	4.28E−06	3.70E−06	2.77E−06	2.19E−06	2.03E−06	1.99E−06
70.00	8.37E−06	3.66E−06	3.26E−06	2.63E−06	2.23E−06	2.06E−06	1.92E−06
75.00	6.69E−06	3.35E−06	3.07E−06	2.63E−06	2.34E−06	2.11E−06	1.86E−06
80.00	5.68E−06	3.19E−06	2.98E−06	2.68E−06	2.45E−06	2.15E−06	1.79E−06
85.00	5.09E−06	3.15E−06	3.00E−06	2.80E−06	2.61E−06	2.22E−06	1.75E−06
90.00	4.76E−06	3.19E−06	3.08E−06	2.96E−06	2.80E−06	2.32E−06	1.76E−06
95.00	4.59E−06	3.28E−06	3.21E−06	3.15E−06	2.99E−06	2.43E−06	1.78E−06
105.00	4.58E−06	3.59E−06	3.57E−06	3.60E−06	3.46E−06	2.73E−06	1.93E−06
120.00	4.97E−06	4.25E−06	4.27E−06	4.40E−06	4.26E−06	3.31E−06	2.29E−06
135.00	5.60E−06	5.06E−06	5.12E−06	5.34E−06	5.15E−06	3.94E−06	2.68E−06
150.00	6.22E−06	5.79E−06	5.88E−06	6.15E−06	5.93E−06	4.53E−06	3.08E−06
165.00	6.67E−06	6.31E−06	6.41E−06	6.73E−06	6.50E−06	4.97E−06	3.39E−06
180.00	6.83E−06	6.49E−06	6.61E−06	6.94E−06	6.71E−06	5.14E−06	3.52E−06
total	1.13E−01	7.44E−02	6.85E−02	5.61E−02	4.25E−02	3.45E−02	3.03E−02
rel ff	1.17E−01	7.65E−02	7.05E−02	5.74E−02	4.37E−02	3.59E−02	3.17E−02
nrl ff	1.19E−01	7.79E−02	7.17E−02	5.85E−02	4.44E−02	3.65E−02	3.23E−02

TABLE 1. Predicted *S*-matrix differential elastic scattering cross sections for photon energies (50.0, 59.54, 145.4, 316.5, 411.8, 468.1, 661.6, 778.9, 964.0, 1004.8, 1112.1, 1274.5, 1408.0 and 1500.0). The angle integrated total cross sections for each element and energies are presented. ''total'' represents total cross sections from this work, ''rel ff'' represents total cross sections calculated from the relativistic form factor and ''nrl ff'' represents total cross sections calculated from the nonrelativistic form factor—Continued[a]

θ (deg)	Photon energy (keV)						
	50.0	59.5	145.4	316.5	411.8	468.1	661.6
Arsenic ($Z=33$)							
0.00	8.70E+01	8.69E+01	8.62E+01	8.60E+01	8.60E+01	8.59E+01	8.59E+01
0.01	8.71E+01	8.69E+01	8.61E+01	8.59E+01	8.59E+01	8.59E+01	8.58E+01
0.02	8.70E+01	8.69E+01	8.61E+01	8.59E+01	8.58E+01	8.58E+01	8.57E+01
0.04	8.70E+01	8.69E+01	8.61E+01	8.58E+01	8.57E+01	8.56E+01	8.53E+01
0.06	8.70E+01	8.69E+01	8.60E+01	8.56E+01	8.54E+01	8.52E+01	8.45E+01
0.10	8.70E+01	8.68E+01	8.60E+01	8.50E+01	8.45E+01	8.40E+01	8.23E+01
0.20	8.69E+01	8.67E+01	8.53E+01	8.26E+01	8.05E+01	7.91E+01	7.40E+01
0.30	8.69E+01	8.66E+01	8.45E+01	7.90E+01	7.52E+01	7.29E+01	6.48E+01
0.40	8.67E+01	8.64E+01	8.33E+01	7.48E+01	6.95E+01	6.64E+01	5.63E+01
0.50	8.64E+01	8.61E+01	8.18E+01	7.04E+01	6.38E+01	6.01E+01	4.87E+01
0.60	8.63E+01	8.58E+01	8.01E+01	6.60E+01	5.84E+01	5.43E+01	4.19E+01
0.70	8.60E+01	8.54E+01	7.83E+01	6.18E+01	5.35E+01	4.90E+01	3.62E+01
0.80	8.57E+01	8.49E+01	7.63E+01	5.77E+01	4.88E+01	4.42E+01	3.12E+01
1.00	8.51E+01	8.39E+01	7.23E+01	5.02E+01	4.06E+01	3.58E+01	2.34E+01
1.20	8.42E+01	8.26E+01	6.82E+01	4.36E+01	3.37E+01	2.91E+01	1.79E+01
1.50	8.27E+01	8.06E+01	6.23E+01	3.53E+01	2.57E+01	2.16E+01	1.23E+01
1.70	8.16E+01	7.91E+01	5.85E+01	3.06E+01	2.17E+01	1.78E+01	9.71E+00
2.00	7.96E+01	7.66E+01	5.32E+01	2.49E+01	1.69E+01	1.36E+01	7.02E+00
2.50	7.62E+01	7.25E+01	4.52E+01	1.80E+01	1.15E+01	9.00E+00	4.41E+00
3.00	7.28E+01	6.83E+01	3.84E+01	1.33E+01	8.07E+00	6.23E+00	3.02E+00
3.50	6.93E+01	6.42E+01	3.26E+01	9.99E+00	5.88E+00	4.52E+00	2.23E+00
4.00	6.59E+01	6.02E+01	2.78E+01	7.69E+00	4.45E+00	3.42E+00	1.73E+00
5.00	5.93E+01	5.29E+01	2.04E+01	4.85E+00	2.81E+00	2.16E+00	1.08E+00
6.00	5.31E+01	4.63E+01	1.53E+01	3.32E+00	1.97E+00	1.49E+00	6.50E−01
7.00	4.75E+01	4.05E+01	1.17E+01	2.42E+00	1.46E+00	1.07E+00	3.96E−01
8.00	4.25E+01	3.54E+01	9.04E+00	1.84E+00	1.08E+00	7.69E−01	2.56E−01
9.00	3.80E+01	3.10E+01	7.13E+00	1.44E+00	7.94E−01	5.50E−01	1.78E−01
10.00	3.40E+01	2.71E+01	5.73E+00	1.14E+00	5.78E−01	3.95E−01	1.33E−01
12.50	2.56E+01	1.98E+01	3.58E+00	6.47E−01	2.78E−01	1.91E−01	8.03E−02
15.00	1.91E+01	1.47E+01	2.46E+00	3.71E−01	1.59E−01	1.13E−01	5.51E−02
17.50	1.42E+01	1.11E+01	1.81E+00	2.25E−01	1.06E−01	7.76E−02	3.76E−02
20.00	1.08E+01	8.53E+00	1.38E+00	1.49E−01	7.90E−02	5.80E−02	2.49E−02
22.50	8.42E+00	6.67E+00	1.06E+00	1.07E−01	6.17E−02	4.47E−02	1.60E−02
25.00	6.76E+00	5.31E+00	7.97E−01	8.17E−02	4.87E−02	3.44E−02	1.01E−02
27.50	5.58E+00	4.30E+00	5.98E−01	6.50E−02	3.82E−02	2.60E−02	6.43E−03
30.00	4.71E+00	3.54E+00	4.49E−01	5.30E−02	2.95E−02	1.93E−02	4.09E−03
35.00	3.51E+00	2.51E+00	2.64E−01	3.63E−02	1.70E−02	1.03E−02	1.70E−03
40.00	2.72E+00	1.86E+00	1.68E−01	2.47E−02	9.60E−03	5.36E−03	7.49E−04
45.00	2.14E+00	1.43E+00	1.15E−01	1.64E−02	5.41E−03	2.84E−03	3.51E−04
50.00	1.69E+00	1.12E+00	8.50E−02	1.07E−02	3.09E−03	1.54E−03	1.76E−04
55.00	1.31E+00	8.73E−01	6.57E−02	6.96E−03	1.81E−03	8.67E−04	9.45E−05
60.00	1.01E+00	6.82E−01	5.26E−02	4.56E−03	1.09E−03	5.08E−04	5.49E−05
65.00	7.79E−01	5.35E−01	4.32E−02	3.04E−03	6.82E−04	3.12E−04	3.45E−05
70.00	6.03E−01	4.23E−01	3.60E−02	2.07E−03	4.45E−04	2.02E−04	2.34E−05
75.00	4.74E−01	3.39E−01	3.05E−02	1.45E−03	3.04E−04	1.38E−04	1.72E−05
80.00	3.82E−01	2.78E−01	2.62E−02	1.06E−03	2.17E−04	9.92E−05	1.35E−05
85.00	3.16E−01	2.34E−01	2.29E−02	8.00E−04	1.63E−04	7.53E−05	1.12E−05
90.00	2.70E−01	2.02E−01	2.03E−02	6.27E−04	1.28E−04	6.01E−05	9.83E−06
95.00	2.38E−01	1.80E−01	1.84E−02	5.10E−04	1.05E−04	5.01E−05	8.97E−06
105.00	2.01E−01	1.54E−01	1.58E−02	3.71E−04	7.87E−05	3.87E−05	8.18E−06
120.00	1.85E−01	1.42E−01	1.39E−02	2.75E−04	6.11E−05	3.14E−05	8.09E−06
135.00	1.89E−01	1.44E−01	1.31E−02	2.32E−04	5.38E−05	2.86E−05	8.54E−06
150.00	1.99E−01	1.51E−01	1.27E−02	2.11E−04	5.06E−05	2.76E−05	9.10E−06
165.00	2.07E−01	1.56E−01	1.26E−02	2.01E−04	4.92E−05	2.73E−05	9.53E−06
180.00	2.11E−01	1.58E−01	1.26E−02	1.98E−04	4.88E−05	2.72E−05	9.70E−06
total	2.14E+01	1.65E+01	3.25E+00	7.27E−01	4.36E−01	3.38E−01	1.71E−01
rel ff	2.15E+01	1.60E+01	3.29E+00	7.44E−01	4.47E−01	3.48E−01	1.76E−01
nrl ff	2.17E+01	1.62E+01	3.34E+00	7.57E−01	4.55E−01	3.54E−01	1.79E−01

TABLE 1. Predicted *S*-matrix differential elastic scattering cross sections for photon energies (50.0, 59.54, 145.4, 316.5, 411.8, 468.1, 661.6, 778.9, 964.0, 1004.8, 1112.1, 1274.5, 1408.0 and 1500.0). The angle integrated total cross sections for each element and energies are presented. ''total'' represents total cross sections from this work, ''rel ff'' represents total cross sections calculated from the relativistic form factor and ''nrl ff'' represents total cross sections calculated from the nonrelativistic form factor—Continued[a]

θ (deg)	Photon energy (keV)						
	778.9	964.0	1004.8	1112.1	1274.5	1408.0	1500.0
Arsenic ($Z=33$)							
0.00	8.59E+01	8.59E+01	8.59E+01	8.59E+01	8.58E+01	8.58E+01	8.59E+01
0.01	8.58E+01	8.58E+01	8.58E+01	8.57E+01	8.57E+01	8.57E+01	8.57E+01
0.02	8.57E+01	8.56E+01	8.56E+01	8.55E+01	8.53E+01	8.50E+01	8.48E+01
0.04	8.50E+01	8.46E+01	8.45E+01	8.42E+01	8.36E+01	8.31E+01	8.26E+01
0.06	8.40E+01	8.30E+01	8.27E+01	8.21E+01	8.11E+01	8.02E+01	7.96E+01
0.10	8.10E+01	7.87E+01	7.82E+01	7.68E+01	7.46E+01	7.28E+01	7.15E+01
0.20	7.07E+01	6.55E+01	6.43E+01	6.14E+01	5.73E+01	5.43E+01	5.23E+01
0.30	6.01E+01	5.33E+01	5.18E+01	4.83E+01	4.33E+01	3.96E+01	3.72E+01
0.40	5.07E+01	4.30E+01	4.14E+01	3.76E+01	3.25E+01	2.89E+01	2.67E+01
0.50	4.26E+01	3.46E+01	3.30E+01	2.93E+01	2.46E+01	2.15E+01	1.96E+01
0.60	3.58E+01	2.79E+01	2.65E+01	2.31E+01	1.89E+01	1.62E+01	1.47E+01
0.70	3.01E+01	2.27E+01	2.14E+01	1.83E+01	1.47E+01	1.25E+01	1.12E+01
0.80	2.54E+01	1.87E+01	1.75E+01	1.48E+01	1.16E+01	9.69E+00	8.63E+00
1.00	1.84E+01	1.29E+01	1.20E+01	9.89E+00	7.55E+00	6.14E+00	5.38E+00
1.20	1.36E+01	9.17E+00	8.45E+00	6.88E+00	5.17E+00	4.20E+00	3.68E+00
1.50	9.00E+00	5.82E+00	5.33E+00	4.30E+00	3.24E+00	2.67E+00	2.38E+00
1.70	7.01E+00	4.47E+00	4.09E+00	3.30E+00	2.51E+00	2.10E+00	1.90E+00
2.00	5.00E+00	3.19E+00	2.92E+00	2.38E+00	1.83E+00	1.54E+00	1.40E+00
2.50	3.15E+00	2.05E+00	1.89E+00	1.54E+00	1.16E+00	9.16E−01	7.68E−01
3.00	2.19E+00	1.45E+00	1.34E+00	1.07E+00	7.38E−01	5.02E−01	3.61E−01
3.50	1.61E+00	1.04E+00	9.50E−01	7.36E−01	4.66E−01	2.87E−01	1.89E−01
4.00	1.21E+00	7.28E−01	6.53E−01	4.87E−01	3.00E−01	1.89E−01	1.30E−01
5.00	6.82E−01	3.47E−01	3.02E−01	2.17E−01	1.45E−01	1.16E−01	1.08E−01
6.00	3.89E−01	1.89E−01	1.65E−01	1.20E−01	8.94E−02	8.50E−02	9.28E−02
7.00	2.38E−01	1.23E−01	1.09E−01	8.41E−02	6.54E−02	6.12E−02	6.33E−02
8.00	1.59E−01	9.12E−02	8.29E−02	6.65E−02	5.08E−02	4.17E−02	3.63E−02
9.00	1.16E−01	7.29E−02	6.72E−02	5.49E−02	3.94E−02	2.72E−02	1.93E−02
10.00	9.04E−02	6.00E−02	5.56E−02	4.51E−02	2.98E−02	1.75E−02	1.05E−02
12.50	5.59E−02	3.54E−02	3.20E−02	2.38E−02	1.30E−02	6.28E−03	3.20E−03
15.00	3.60E−02	1.87E−02	1.61E−02	1.07E−02	5.22E−03	2.57E−03	1.45E−03
17.50	2.23E−02	9.45E−03	7.79E−03	4.65E−03	2.11E−03	1.10E−03	7.01E−04
20.00	1.34E−02	4.80E−03	3.82E−03	2.11E−03	9.01E−04	4.78E−04	3.24E−04
22.50	7.86E−03	2.49E−03	1.94E−03	1.01E−03	4.08E−04	2.13E−04	1.46E−04
25.00	4.62E−03	1.33E−03	1.02E−03	5.11E−04	1.96E−04	9.93E−05	6.66E−05
27.50	2.74E−03	7.32E−04	5.53E−04	2.70E−04	1.00E−04	4.91E−05	3.21E−05
30.00	1.65E−03	4.16E−04	3.11E−04	1.50E−04	5.42E−05	2.61E−05	1.68E−05
35.00	6.29E−04	1.47E−04	1.09E−04	5.16E−05	1.85E−05	8.83E−06	5.61E−06
40.00	2.61E−04	5.96E−05	4.43E−05	2.14E−05	8.18E−06	4.19E−06	2.82E−06
45.00	1.19E−04	2.78E−05	2.10E−05	1.08E−05	4.74E−06	2.83E−06	2.16E−06
50.00	5.93E−05	1.48E−05	1.14E−05	6.34E−06	3.24E−06	2.25E−06	1.92E−06
55.00	3.27E−05	9.01E−06	7.19E−06	4.37E−06	2.63E−06	2.11E−06	1.99E−06
60.00	1.99E−05	6.25E−06	5.17E−06	3.46E−06	2.41E−06	2.15E−06	2.16E−06
65.00	1.33E−05	4.80E−06	4.10E−06	2.99E−06	2.31E−06	2.15E−06	2.15E−06
70.00	9.75E−06	4.05E−06	3.57E−06	2.81E−06	2.34E−06	2.19E−06	2.10E−06
75.00	7.72E−06	3.67E−06	3.33E−06	2.79E−06	2.45E−06	2.26E−06	2.06E−06
80.00	6.49E−06	3.46E−06	3.21E−06	2.83E−06	2.57E−06	2.31E−06	1.99E−06
85.00	5.77E−06	3.41E−06	3.22E−06	2.95E−06	2.74E−06	2.39E−06	1.95E−06
90.00	5.36E−06	3.44E−06	3.31E−06	3.13E−06	2.95E−06	2.50E−06	1.95E−06
95.00	5.15E−06	3.54E−06	3.43E−06	3.32E−06	3.16E−06	2.62E−06	1.98E−06
105.00	5.09E−06	3.86E−06	3.82E−06	3.81E−06	3.66E−06	2.94E−06	2.13E−06
120.00	5.47E−06	4.56E−06	4.56E−06	4.67E−06	4.52E−06	3.55E−06	2.49E−06
135.00	6.13E−06	5.42E−06	5.47E−06	5.67E−06	5.47E−06	4.20E−06	2.87E−06
150.00	6.77E−06	6.19E−06	6.27E−06	6.55E−06	6.31E−06	4.82E−06	3.28E−06
165.00	7.24E−06	6.74E−06	6.84E−06	7.17E−06	6.91E−06	5.28E−06	3.59E−06
180.00	7.41E−06	6.93E−06	7.05E−06	7.39E−06	7.14E−06	5.46E−06	3.72E−06
total	1.23E−01	8.07E−02	7.44E−02	6.08E−02	4.61E−02	3.75E−02	3.30E−02
rel ff	1.27E−01	8.32E−02	7.66E−02	6.24E−02	4.75E−02	3.90E−02	3.45E−02
nrl ff	1.29E−01	8.47E−02	7.80E−02	6.36E−02	4.84E−02	3.98E−02	3.51E−02

TABLE 1. Predicted *S*-matrix differential elastic scattering cross sections for photon energies (50.0, 59.54, 145.4, 316.5, 411.8, 468.1, 661.6, 778.9, 964.0, 1004.8, 1112.1, 1274.5, 1408.0 and 1500.0). The angle integrated total cross sections for each element and energies are presented. ''total'' represents total cross sections from this work, ''rel ff'' represents total cross sections calculated from the relativistic form factor and ''nrl ff'' represents total cross sections calculated from the nonrelativistic form factor—Continued[a]

θ (deg)	Photon energy (keV)						
	50.0	59.5	145.4	316.5	411.8	468.1	661.6
Selenium ($Z=34$)							
0.00	9.24E+01	9.23E+01	9.15E+01	9.12E+01	9.12E+01	9.12E+01	9.12E+01
0.01	9.24E+01	9.23E+01	9.14E+01	9.12E+01	9.12E+01	9.11E+01	9.11E+01
0.02	9.24E+01	9.23E+01	9.14E+01	9.11E+01	9.11E+01	9.11E+01	9.10E+01
0.04	9.24E+01	9.22E+01	9.13E+01	9.11E+01	9.10E+01	9.09E+01	9.04E+01
0.06	9.24E+01	9.22E+01	9.13E+01	9.09E+01	9.06E+01	9.04E+01	8.97E+01
0.10	9.23E+01	9.22E+01	9.13E+01	9.02E+01	8.96E+01	8.91E+01	8.72E+01
0.20	9.23E+01	9.21E+01	9.05E+01	8.76E+01	8.53E+01	8.38E+01	7.82E+01
0.30	9.22E+01	9.20E+01	8.96E+01	8.37E+01	7.96E+01	7.71E+01	6.84E+01
0.40	9.20E+01	9.17E+01	8.84E+01	7.92E+01	7.34E+01	7.01E+01	5.94E+01
0.50	9.17E+01	9.13E+01	8.67E+01	7.44E+01	6.74E+01	6.35E+01	5.13E+01
0.60	9.16E+01	9.11E+01	8.49E+01	6.97E+01	6.17E+01	5.73E+01	4.42E+01
0.70	9.13E+01	9.06E+01	8.29E+01	6.52E+01	5.64E+01	5.17E+01	3.82E+01
0.80	9.10E+01	9.01E+01	8.08E+01	6.09E+01	5.15E+01	4.66E+01	3.31E+01
1.00	9.03E+01	8.90E+01	7.65E+01	5.30E+01	4.28E+01	3.79E+01	2.51E+01
1.20	8.93E+01	8.76E+01	7.21E+01	4.60E+01	3.57E+01	3.09E+01	1.95E+01
1.50	8.77E+01	8.54E+01	6.58E+01	3.73E+01	2.75E+01	2.32E+01	1.36E+01
1.70	8.65E+01	8.37E+01	6.17E+01	3.25E+01	2.33E+01	1.94E+01	1.08E+01
2.00	8.44E+01	8.12E+01	5.61E+01	2.67E+01	1.84E+01	1.50E+01	7.81E+00
2.50	8.08E+01	7.67E+01	4.77E+01	1.95E+01	1.27E+01	1.00E+01	4.80E+00
3.00	7.71E+01	7.22E+01	4.05E+01	1.46E+01	8.99E+00	6.90E+00	3.21E+00
3.50	7.34E+01	6.78E+01	3.46E+01	1.11E+01	6.51E+00	4.95E+00	2.34E+00
4.00	6.97E+01	6.36E+01	2.96E+01	8.54E+00	4.84E+00	3.69E+00	1.82E+00
5.00	6.25E+01	5.58E+01	2.20E+01	5.32E+00	2.97E+00	2.28E+00	1.17E+00
6.00	5.57E+01	4.89E+01	1.68E+01	3.57E+00	2.06E+00	1.57E+00	7.27E−01
7.00	4.96E+01	4.28E+01	1.29E+01	2.56E+00	1.55E+00	1.15E+00	4.48E−01
8.00	4.43E+01	3.74E+01	1.01E+01	1.94E+00	1.18E+00	8.45E−01	2.87E−01
9.00	3.98E+01	3.29E+01	7.94E+00	1.52E+00	8.80E−01	6.15E−01	1.96E−01
10.00	3.58E+01	2.89E+01	6.34E+00	1.22E+00	6.50E−01	4.44E−01	1.44E−01
12.50	2.77E+01	2.14E+01	3.84E+00	7.16E−01	3.13E−01	2.13E−01	8.44E−02
15.00	2.12E+01	1.61E+01	2.59E+00	4.17E−01	1.74E−01	1.22E−01	5.84E−02
17.50	1.61E+01	1.23E+01	1.91E+00	2.52E−01	1.13E−01	8.21E−02	4.07E−02
20.00	1.22E+01	9.51E+00	1.47E+00	1.64E−01	8.32E−02	6.10E−02	2.74E−02
22.50	9.43E+00	7.42E+00	1.14E+00	1.16E−01	6.51E−02	4.74E−02	1.80E−02
25.00	7.45E+00	5.86E+00	8.80E−01	8.71E−02	5.19E−02	3.70E−02	1.16E−02
27.50	6.04E+00	4.70E+00	6.69E−01	6.88E−02	4.12E−02	2.84E−02	7.43E−03
30.00	5.02E+00	3.82E+00	5.06E−01	5.60E−02	3.22E−02	2.14E−02	4.77E−03
35.00	3.66E+00	2.66E+00	2.97E−01	3.88E−02	1.90E−02	1.17E−02	2.02E−03
40.00	2.83E+00	1.96E+00	1.86E−01	2.68E−02	1.09E−02	6.21E−03	8.98E−04
45.00	2.25E+00	1.51E+00	1.26E−01	1.81E−02	6.26E−03	3.33E−03	4.23E−04
50.00	1.80E+00	1.19E+00	9.11E−02	1.20E−02	3.62E−03	1.83E−03	2.12E−04
55.00	1.43E+00	9.44E−01	6.97E−02	7.95E−03	2.14E−03	1.04E−03	1.14E−04
60.00	1.12E+00	7.49E−01	5.56E−02	5.27E−03	1.30E−03	6.11E−04	6.62E−05
65.00	8.77E−01	5.94E−01	4.57E−02	3.54E−03	8.17E−04	3.77E−04	4.13E−05
70.00	6.87E−01	4.74E−01	3.83E−02	2.44E−03	5.35E−04	2.44E−04	2.79E−05
75.00	5.44E−01	3.83E−01	3.26E−02	1.72E−03	3.66E−04	1.67E−04	2.03E−05
80.00	4.39E−01	3.15E−01	2.82E−02	1.26E−03	2.63E−04	1.20E−04	1.58E−05
85.00	3.63E−01	2.65E−01	2.48E−02	9.56E−04	1.98E−04	9.10E−05	1.31E−05
90.00	3.10E−01	2.29E−01	2.22E−02	7.53E−04	1.55E−04	7.26E−05	1.14E−05
95.00	2.72E−01	2.03E−01	2.02E−02	6.14E−04	1.27E−04	6.04E−05	1.04E−05
105.00	2.28E−01	1.73E−01	1.75E−02	4.49E−04	9.51E−05	4.64E−05	9.36E−06
120.00	2.06E−01	1.58E−01	1.56E−02	3.33E−04	7.36E−05	3.74E−05	9.15E−06
135.00	2.07E−01	1.59E−01	1.49E−02	2.82E−04	6.45E−05	3.39E−05	9.57E−06
150.00	2.16E−01	1.65E−01	1.46E−02	2.56E−04	6.04E−05	3.25E−05	1.01E−05
165.00	2.25E−01	1.70E−01	1.45E−02	2.44E−04	5.86E−05	3.20E−05	1.06E−05
180.00	2.28E−01	1.72E−01	1.44E−02	2.40E−04	5.81E−05	3.19E−05	1.07E−05
total	2.31E+01	1.79E+01	3.52E+00	7.88E−01	4.73E−01	3.66E−01	1.85E−01
rel ff	2.32E+01	1.73E+01	3.55E+00	8.06E−01	4.84E−01	3.77E−01	1.90E−01
nrl ff	2.35E+01	1.75E+01	3.61E+00	8.21E−01	4.94E−01	3.84E−01	1.94E−01

TABLE 1. Predicted *S*-matrix differential elastic scattering cross sections for photon energies (50.0, 59.54, 145.4, 316.5, 411.8, 468.1, 661.6, 778.9, 964.0, 1004.8, 1112.1, 1274.5, 1408.0 and 1500.0). The angle integrated total cross sections for each element and energies are presented. ''total'' represents total cross sections from this work, ''rel ff'' represents total cross sections calculated from the relativistic form factor and ''nrl ff'' represents total cross sections calculated from the nonrelativistic form factor—Continued[a]

θ (deg)	Photon energy (keV)						
	778.9	964.0	1004.8	1112.1	1274.5	1408.0	1500.0
Selenium ($Z=34$)							
0.00	9.12E+01	9.11E+01	9.11E+01	9.11E+01	9.11E+01	9.11E+01	9.11E+01
0.01	9.11E+01	9.10E+01	9.10E+01	9.10E+01	9.09E+01	9.09E+01	9.09E+01
0.02	9.09E+01	9.08E+01	9.08E+01	9.07E+01	9.05E+01	9.02E+01	8.99E+01
0.04	9.02E+01	8.98E+01	8.97E+01	8.93E+01	8.87E+01	8.81E+01	8.75E+01
0.06	8.91E+01	8.80E+01	8.77E+01	8.70E+01	8.59E+01	8.50E+01	8.43E+01
0.10	8.58E+01	8.34E+01	8.28E+01	8.13E+01	7.89E+01	7.70E+01	7.56E+01
0.20	7.47E+01	6.91E+01	6.79E+01	6.49E+01	6.05E+01	5.72E+01	5.52E+01
0.30	6.35E+01	5.62E+01	5.47E+01	5.09E+01	4.56E+01	4.18E+01	3.93E+01
0.40	5.35E+01	4.53E+01	4.37E+01	3.97E+01	3.44E+01	3.07E+01	2.85E+01
0.50	4.50E+01	3.66E+01	3.50E+01	3.11E+01	2.63E+01	2.31E+01	2.13E+01
0.60	3.78E+01	2.97E+01	2.82E+01	2.47E+01	2.04E+01	1.77E+01	1.62E+01
0.70	3.20E+01	2.44E+01	2.30E+01	1.99E+01	1.61E+01	1.38E+01	1.25E+01
0.80	2.72E+01	2.02E+01	1.90E+01	1.62E+01	1.29E+01	1.08E+01	9.61E+00
1.00	2.00E+01	1.43E+01	1.33E+01	1.10E+01	8.42E+00	6.77E+00	5.83E+00
1.20	1.50E+01	1.02E+01	9.44E+00	7.69E+00	5.71E+00	4.51E+00	3.85E+00
1.50	1.00E+01	6.45E+00	5.89E+00	4.70E+00	3.46E+00	2.79E+00	2.45E+00
1.70	7.78E+00	4.88E+00	4.44E+00	3.54E+00	2.65E+00	2.20E+00	2.00E+00
2.00	5.49E+00	3.39E+00	3.09E+00	2.48E+00	1.91E+00	1.66E+00	1.57E+00
2.50	3.36E+00	2.13E+00	1.96E+00	1.60E+00	1.24E+00	1.03E+00	9.23E−01
3.00	2.30E+00	1.53E+00	1.42E+00	1.15E+00	8.16E−01	5.72E−01	4.22E−01
3.50	1.70E+00	1.14E+00	1.05E+00	8.25E−01	5.29E−01	3.19E−01	2.03E−01
4.00	1.30E+00	8.16E−01	7.38E−01	5.60E−01	3.42E−01	2.03E−01	1.31E−01
5.00	7.57E−01	3.95E−01	3.45E−01	2.47E−01	1.59E−01	1.20E−01	1.04E−01
6.00	4.38E−01	2.10E−01	1.82E−01	1.31E−01	9.48E−02	8.88E−02	9.64E−02
7.00	2.65E−01	1.32E−01	1.16E−01	8.77E−02	6.81E−02	6.64E−02	7.27E−02
8.00	1.74E−01	9.55E−02	8.60E−02	6.80E−02	5.30E−02	4.67E−02	4.43E−02
9.00	1.25E−01	7.58E−02	6.95E−02	5.66E−02	4.18E−02	3.09E−02	2.37E−02
10.00	9.60E−02	6.29E−02	5.82E−02	4.76E−02	3.23E−02	1.99E−02	1.25E−02
12.50	5.91E−02	3.86E−02	3.52E−02	2.68E−02	1.49E−02	7.11E−03	3.54E−03
15.00	3.88E−02	2.11E−02	1.83E−02	1.24E−02	6.14E−03	2.96E−03	1.61E−03
17.50	2.47E−02	1.09E−02	9.03E−03	5.49E−03	2.52E−03	1.30E−03	8.09E−04
20.00	1.51E−02	5.60E−03	4.49E−03	2.52E−03	1.09E−03	5.75E−04	3.87E−04
22.50	9.04E−03	2.94E−03	2.30E−03	1.22E−03	4.95E−04	2.59E−04	1.78E−04
25.00	5.39E−03	1.59E−03	1.22E−03	6.17E−04	2.39E−04	1.22E−04	8.19E−05
27.50	3.23E−03	8.80E−04	6.66E−04	3.27E−04	1.22E−04	6.00E−05	3.95E−05
30.00	1.96E−03	5.02E−04	3.77E−04	1.81E−04	6.58E−05	3.17E−05	2.05E−05
35.00	7.57E−04	1.79E−04	1.32E−04	6.24E−05	2.22E−05	1.05E−05	6.62E−06
40.00	3.16E−04	7.20E−05	5.34E−05	2.55E−05	9.55E−06	4.79E−06	3.17E−06
45.00	1.44E−04	3.33E−05	2.50E−05	1.27E−05	5.38E−06	3.12E−06	2.32E−06
50.00	7.16E−05	1.74E−05	1.34E−05	7.27E−06	3.58E−06	2.41E−06	2.02E−06
55.00	3.92E−05	1.05E−05	8.28E−06	4.91E−06	2.85E−06	2.24E−06	2.09E−06
60.00	2.37E−05	7.13E−06	5.84E−06	3.81E−06	2.58E−06	2.28E−06	2.29E−06
65.00	1.57E−05	5.40E−06	4.56E−06	3.25E−06	2.45E−06	2.29E−06	2.32E−06
70.00	1.13E−05	4.50E−06	3.93E−06	3.02E−06	2.47E−06	2.34E−06	2.30E−06
75.00	8.90E−06	4.04E−06	3.63E−06	2.98E−06	2.59E−06	2.42E−06	2.27E−06
80.00	7.42E−06	3.78E−06	3.48E−06	3.01E−06	2.71E−06	2.48E−06	2.21E−06
85.00	6.56E−06	3.71E−06	3.47E−06	3.13E−06	2.89E−06	2.57E−06	2.17E−06
90.00	6.06E−06	3.73E−06	3.56E−06	3.31E−06	3.11E−06	2.69E−06	2.17E−06
95.00	5.79E−06	3.83E−06	3.69E−06	3.52E−06	3.34E−06	2.82E−06	2.19E−06
105.00	5.68E−06	4.17E−06	4.09E−06	4.05E−06	3.88E−06	3.17E−06	2.34E−06
120.00	6.05E−06	4.90E−06	4.88E−06	4.97E−06	4.80E−06	3.80E−06	2.70E−06
135.00	6.72E−06	5.81E−06	5.85E−06	6.03E−06	5.81E−06	4.49E−06	3.09E−06
150.00	7.39E−06	6.63E−06	6.70E−06	6.97E−06	6.71E−06	5.13E−06	3.50E−06
165.00	7.88E−06	7.21E−06	7.30E−06	7.63E−06	7.35E−06	5.61E−06	3.81E−06
180.00	8.05E−06	7.42E−06	7.52E−06	7.87E−06	7.59E−06	5.80E−06	3.95E−06
total	1.33E−01	8.74E−02	8.06E−02	6.59E−02	4.99E−02	4.06E−02	3.59E−02
rel ff	1.38E−01	9.01E−02	8.30E−02	6.77E−02	5.14E−02	4.23E−02	3.73E−02
nrl ff	1.41E−01	9.20E−02	8.47E−02	6.91E−02	5.25E−02	4.32E−02	3.82E−02

TABLE 1. Predicted *S*-matrix differential elastic scattering cross sections for photon energies (50.0, 59.54, 145.4, 316.5, 411.8, 468.1, 661.6, 778.9, 964.0, 1004.8, 1112.1, 1274.5, 1408.0 and 1500.0). The angle integrated total cross sections for each element and energies are presented. ''total'' represents total cross sections from this work, ''rel ff'' represents total cross sections calculated from the relativistic form factor and ''nrl ff'' represents total cross sections calculated from the nonrelativistic form factor—Continued[a]

θ (deg)	Photon energy (keV)						
	50.0	59.5	145.4	316.5	411.8	468.1	661.6
Bromine ($Z=35$)							
0.00	9.80E+01	9.78E+01	9.69E+01	9.66E+01	9.66E+01	9.66E+01	9.66E+01
0.01	9.80E+01	9.78E+01	9.68E+01	9.66E+01	9.66E+01	9.66E+01	9.65E+01
0.02	9.80E+01	9.78E+01	9.69E+01	9.66E+01	9.65E+01	9.65E+01	9.64E+01
0.04	9.79E+01	9.77E+01	9.68E+01	9.65E+01	9.64E+01	9.63E+01	9.58E+01
0.06	9.79E+01	9.77E+01	9.68E+01	9.63E+01	9.59E+01	9.57E+01	9.49E+01
0.10	9.79E+01	9.77E+01	9.67E+01	9.56E+01	9.49E+01	9.44E+01	9.23E+01
0.20	9.78E+01	9.76E+01	9.59E+01	9.27E+01	9.02E+01	8.86E+01	8.27E+01
0.30	9.77E+01	9.75E+01	9.49E+01	8.85E+01	8.41E+01	8.14E+01	7.22E+01
0.40	9.75E+01	9.72E+01	9.36E+01	8.37E+01	7.75E+01	7.40E+01	6.26E+01
0.50	9.72E+01	9.68E+01	9.18E+01	7.86E+01	7.11E+01	6.70E+01	5.41E+01
0.60	9.71E+01	9.65E+01	8.98E+01	7.36E+01	6.50E+01	6.04E+01	4.67E+01
0.70	9.67E+01	9.60E+01	8.77E+01	6.88E+01	5.95E+01	5.45E+01	4.04E+01
0.80	9.64E+01	9.54E+01	8.54E+01	6.42E+01	5.43E+01	4.91E+01	3.50E+01
1.00	9.57E+01	9.43E+01	8.08E+01	5.58E+01	4.52E+01	4.00E+01	2.69E+01
1.20	9.46E+01	9.28E+01	7.61E+01	4.85E+01	3.78E+01	3.28E+01	2.10E+01
1.50	9.28E+01	9.03E+01	6.94E+01	3.94E+01	2.93E+01	2.49E+01	1.49E+01
1.70	9.15E+01	8.86E+01	6.51E+01	3.45E+01	2.50E+01	2.09E+01	1.19E+01
2.00	8.93E+01	8.58E+01	5.92E+01	2.84E+01	1.99E+01	1.63E+01	8.63E+00
2.50	8.55E+01	8.10E+01	5.03E+01	2.11E+01	1.40E+01	1.10E+01	5.22E+00
3.00	8.16E+01	7.62E+01	4.28E+01	1.60E+01	9.95E+00	7.61E+00	3.41E+00
3.50	7.77E+01	7.16E+01	3.66E+01	1.22E+01	7.16E+00	5.40E+00	2.46E+00
4.00	7.37E+01	6.71E+01	3.14E+01	9.43E+00	5.27E+00	3.97E+00	1.92E+00
5.00	6.59E+01	5.89E+01	2.37E+01	5.82E+00	3.14E+00	2.41E+00	1.26E+00
6.00	5.84E+01	5.15E+01	1.83E+01	3.84E+00	2.17E+00	1.66E+00	8.07E−01
7.00	5.18E+01	4.51E+01	1.42E+01	2.72E+00	1.65E+00	1.23E+00	5.02E−01
8.00	4.63E+01	3.96E+01	1.11E+01	2.05E+00	1.27E+00	9.23E−01	3.20E−01
9.00	4.17E+01	3.48E+01	8.78E+00	1.62E+00	9.69E−01	6.81E−01	2.16E−01
10.00	3.78E+01	3.08E+01	6.97E+00	1.31E+00	7.24E−01	4.97E−01	1.56E−01
12.50	2.99E+01	2.31E+01	4.13E+00	7.87E−01	3.50E−01	2.36E−01	8.91E−02
15.00	2.34E+01	1.76E+01	2.73E+00	4.64E−01	1.90E−01	1.32E−01	6.18E−02
17.50	1.79E+01	1.36E+01	2.01E+00	2.81E−01	1.21E−01	8.71E−02	4.38E−02
20.00	1.37E+01	1.05E+01	1.57E+00	1.81E−01	8.79E−02	6.42E−02	3.01E−02
22.50	1.05E+01	8.21E+00	1.24E+00	1.25E−01	6.87E−02	5.02E−02	2.00E−02
25.00	8.19E+00	6.45E+00	9.66E−01	9.32E−02	5.51E−02	3.96E−02	1.31E−02
27.50	6.55E+00	5.12E+00	7.43E−01	7.30E−02	4.42E−02	3.09E−02	8.51E−03
30.00	5.36E+00	4.13E+00	5.67E−01	5.93E−02	3.50E−02	2.36E−02	5.53E−03
35.00	3.84E+00	2.83E+00	3.33E−01	4.13E−02	2.11E−02	1.32E−02	2.38E−03
40.00	2.95E+00	2.07E+00	2.06E−01	2.90E−02	1.23E−02	7.13E−03	1.07E−03
45.00	2.36E+00	1.60E+00	1.37E−01	1.99E−02	7.17E−03	3.88E−03	5.07E−04
50.00	1.92E+00	1.27E+00	9.79E−02	1.35E−02	4.20E−03	2.15E−03	2.55E−04
55.00	1.55E+00	1.02E+00	7.42E−02	9.00E−03	2.50E−03	1.23E−03	1.37E−04
60.00	1.24E+00	8.17E−01	5.89E−02	6.03E−03	1.53E−03	7.29E−04	7.93E−05
65.00	9.79E−01	6.55E−01	4.84E−02	4.10E−03	9.69E−04	4.51E−04	4.93E−05
70.00	7.74E−01	5.27E−01	4.07E−02	2.84E−03	6.38E−04	2.93E−04	3.31E−05
75.00	6.17E−01	4.28E−01	3.48E−02	2.02E−03	4.38E−04	2.00E−04	2.40E−05
80.00	5.00E−01	3.54E−01	3.03E−02	1.49E−03	3.15E−04	1.44E−04	1.86E−05
85.00	4.14E−01	2.98E−01	2.68E−02	1.13E−03	2.37E−04	1.09E−04	1.53E−05
90.00	3.53E−01	2.58E−01	2.41E−02	8.96E−04	1.87E−04	8.71E−05	1.33E−05
95.00	3.09E−01	2.29E−01	2.20E−02	7.33E−04	1.53E−04	7.24E−05	1.20E−05
105.00	2.57E−01	1.94E−01	1.93E−02	5.38E−04	1.14E−04	5.55E−05	1.07E−05
120.00	2.29E−01	1.75E−01	1.75E−02	4.01E−04	8.82E−05	4.45E−05	1.04E−05
135.00	2.28E−01	1.75E−01	1.68E−02	3.39E−04	7.70E−05	4.01E−05	1.07E−05
150.00	2.36E−01	1.80E−01	1.65E−02	3.08E−04	7.19E−05	3.83E−05	1.13E−05
165.00	2.44E−01	1.86E−01	1.65E−02	2.93E−04	6.96E−05	3.76E−05	1.18E−05
180.00	2.47E−01	1.88E−01	1.64E−02	2.89E−04	6.89E−05	3.74E−05	1.19E−05
total	2.50E+01	1.93E+01	3.80E+00	8.51E−01	5.11E−01	3.96E−01	2.00E−01
rel ff	2.50E+01	1.87E+01	3.83E+00	8.70E−01	5.23E−01	4.07E−01	2.06E−01
nrl ff	2.54E+01	1.89E+01	3.90E+00	8.88E−01	5.35E−01	4.17E−01	2.10E−01

TABLE 1. Predicted *S*-matrix differential elastic scattering cross sections for photon energies (50.0, 59.54, 145.4, 316.5, 411.8, 468.1, 661.6, 778.9, 964.0, 1004.8, 1112.1, 1274.5, 1408.0 and 1500.0). The angle integrated total cross sections for each element and energies are presented. ''total'' represents total cross sections from this work, ''rel ff'' represents total cross sections calculated from the relativistic form factor and ''nrl ff'' represents total cross sections calculated from the nonrelativistic form factor—Continued[a]

θ (deg)	Photon energy (keV)						
	778.9	964.0	1004.8	1112.1	1274.5	1408.0	1500.0
Bromine ($Z=35$)							
0.00	9.66E+01	9.65E+01	9.65E+01	9.65E+01	9.65E+01	9.65E+01	9.65E+01
0.01	9.65E+01	9.64E+01	9.64E+01	9.64E+01	9.64E+01	9.63E+01	9.63E+01
0.02	9.63E+01	9.62E+01	9.62E+01	9.61E+01	9.58E+01	9.55E+01	9.52E+01
0.04	9.55E+01	9.51E+01	9.50E+01	9.46E+01	9.39E+01	9.32E+01	9.26E+01
0.06	9.43E+01	9.31E+01	9.29E+01	9.21E+01	9.09E+01	8.99E+01	8.92E+01
0.10	9.08E+01	8.82E+01	8.76E+01	8.59E+01	8.34E+01	8.13E+01	7.99E+01
0.20	7.89E+01	7.30E+01	7.17E+01	6.84E+01	6.38E+01	6.03E+01	5.81E+01
0.30	6.70E+01	5.92E+01	5.76E+01	5.36E+01	4.81E+01	4.41E+01	4.15E+01
0.40	5.64E+01	4.78E+01	4.61E+01	4.19E+01	3.64E+01	3.26E+01	3.03E+01
0.50	4.74E+01	3.87E+01	3.70E+01	3.30E+01	2.80E+01	2.48E+01	2.29E+01
0.60	4.00E+01	3.16E+01	3.00E+01	2.64E+01	2.20E+01	1.93E+01	1.78E+01
0.70	3.39E+01	2.61E+01	2.47E+01	2.14E+01	1.76E+01	1.52E+01	1.38E+01
0.80	2.90E+01	2.18E+01	2.06E+01	1.76E+01	1.42E+01	1.19E+01	1.06E+01
1.00	2.16E+01	1.56E+01	1.46E+01	1.22E+01	9.33E+00	7.44E+00	6.33E+00
1.20	1.64E+01	1.13E+01	1.05E+01	8.53E+00	6.27E+00	4.86E+00	4.05E+00
1.50	1.11E+01	7.11E+00	6.48E+00	5.13E+00	3.71E+00	2.93E+00	2.53E+00
1.70	8.59E+00	5.31E+00	4.82E+00	3.79E+00	2.80E+00	2.31E+00	2.10E+00
2.00	6.00E+00	3.61E+00	3.28E+00	2.60E+00	2.01E+00	1.78E+00	1.73E+00
2.50	3.60E+00	2.23E+00	2.04E+00	1.67E+00	1.32E+00	1.16E+00	1.09E+00
3.00	2.43E+00	1.62E+00	1.50E+00	1.23E+00	8.96E−01	6.46E−01	4.88E−01
3.50	1.80E+00	1.23E+00	1.14E+00	9.15E−01	5.93E−01	3.55E−01	2.21E−01
4.00	1.39E+00	9.06E−01	8.26E−01	6.35E−01	3.86E−01	2.20E−01	1.34E−01
5.00	8.34E−01	4.45E−01	3.90E−01	2.79E−01	1.75E−01	1.25E−01	1.02E−01
6.00	4.89E−01	2.32E−01	2.01E−01	1.43E−01	1.01E−01	9.27E−02	9.96E−02
7.00	2.95E−01	1.42E−01	1.24E−01	9.21E−02	7.12E−02	7.15E−02	8.17E−02
8.00	1.91E−01	1.00E−01	8.98E−02	7.01E−02	5.54E−02	5.17E−02	5.27E−02
9.00	1.35E−01	7.92E−02	7.23E−02	5.85E−02	4.43E−02	3.48E−02	2.86E−02
10.00	1.02E−01	6.60E−02	6.11E−02	5.01E−02	3.49E−02	2.25E−02	1.48E−02
12.50	6.25E−02	4.18E−02	3.84E−02	2.98E−02	1.69E−02	8.03E−03	3.93E−03
15.00	4.17E−02	2.35E−02	2.06E−02	1.43E−02	7.16E−03	3.39E−03	1.79E−03
17.50	2.71E−02	1.24E−02	1.04E−02	6.42E−03	2.98E−03	1.52E−03	9.26E−04
20.00	1.69E−02	6.49E−03	5.23E−03	2.98E−03	1.30E−03	6.85E−04	4.57E−04
22.50	1.03E−02	3.45E−03	2.71E−03	1.45E−03	5.95E−04	3.13E−04	2.14E−04
25.00	6.22E−03	1.88E−03	1.44E−03	7.39E−04	2.88E−04	1.47E−04	9.97E−05
27.50	3.77E−03	1.05E−03	7.96E−04	3.94E−04	1.47E−04	7.29E−05	4.81E−05
30.00	2.31E−03	6.01E−04	4.52E−04	2.18E−04	7.95E−05	3.84E−05	2.48E−05
35.00	9.03E−04	2.15E−04	1.59E−04	7.49E−05	2.64E−05	1.24E−05	7.79E−06
40.00	3.79E−04	8.64E−05	6.40E−05	3.04E−05	1.11E−05	5.47E−06	3.57E−06
45.00	1.73E−04	3.96E−05	2.97E−05	1.48E−05	6.10E−06	3.44E−06	2.51E−06
50.00	8.59E−05	2.05E−05	1.57E−05	8.34E−06	3.97E−06	2.60E−06	2.13E−06
55.00	4.67E−05	1.21E−05	9.52E−06	5.52E−06	3.10E−06	2.38E−06	2.20E−06
60.00	2.80E−05	8.14E−06	6.60E−06	4.21E−06	2.77E−06	2.42E−06	2.44E−06
65.00	1.84E−05	6.07E−06	5.09E−06	3.54E−06	2.61E−06	2.44E−06	2.50E−06
70.00	1.32E−05	5.00E−06	4.33E−06	3.25E−06	2.62E−06	2.50E−06	2.51E−06
75.00	1.03E−05	4.45E−06	3.96E−06	3.19E−06	2.73E−06	2.60E−06	2.50E−06
80.00	8.49E−06	4.15E−06	3.78E−06	3.21E−06	2.87E−06	2.67E−06	2.44E−06
85.00	7.46E−06	4.04E−06	3.76E−06	3.33E−06	3.06E−06	2.76E−06	2.40E−06
90.00	6.86E−06	4.06E−06	3.84E−06	3.53E−06	3.29E−06	2.90E−06	2.40E−06
95.00	6.53E−06	4.15E−06	3.98E−06	3.75E−06	3.54E−06	3.04E−06	2.42E−06
105.00	6.35E−06	4.51E−06	4.40E−06	4.30E−06	4.12E−06	3.41E−06	2.57E−06
120.00	6.70E−06	5.28E−06	5.24E−06	5.28E−06	5.09E−06	4.08E−06	2.93E−06
135.00	7.39E−06	6.24E−06	6.26E−06	6.42E−06	6.17E−06	4.79E−06	3.32E−06
150.00	8.08E−06	7.10E−06	7.16E−06	7.41E−06	7.12E−06	5.46E−06	3.74E−06
165.00	8.59E−06	7.72E−06	7.80E−06	8.11E−06	7.80E−06	5.96E−06	4.06E−06
180.00	8.78E−06	7.94E−06	8.03E−06	8.37E−06	8.06E−06	6.16E−06	4.20E−06
total	1.44E−01	9.45E−02	8.71E−02	7.13E−02	5.40E−02	4.39E−02	3.89E−02
rel ff	1.49E−01	9.74E−02	8.97E−02	7.32E−02	5.56E−02	4.57E−02	4.04E−02
nrl ff	1.52E−01	9.96E−02	9.18E−02	7.49E−02	5.69E−02	4.68E−02	4.13E−02

TABLE 1. Predicted *S*-matrix differential elastic scattering cross sections for photon energies (50.0, 59.54, 145.4, 316.5, 411.8, 468.1, 661.6, 778.9, 964.0, 1004.8, 1112.1, 1274.5, 1408.0 and 1500.0). The angle integrated total cross sections for each element and energies are presented. ''total'' represents total cross sections from this work, ''rel ff'' represents total cross sections calculated from the relativistic form factor and ''nrl ff'' represents total cross sections calculated from the nonrelativistic form factor—Continued[a]

θ (deg)	Photon energy (keV)						
	50.0	59.5	145.4	316.5	411.8	468.1	661.6
Krypton ($Z=36$)							
0.00	1.04E+02	1.04E+02	1.03E+02	1.02E+02	1.02E+02	1.02E+02	1.02E+02
0.01	1.04E+02	1.04E+02	1.02E+02	1.02E+02	1.02E+02	1.02E+02	1.02E+02
0.02	1.04E+02	1.03E+02	1.02E+02	1.02E+02	1.02E+02	1.02E+02	1.02E+02
0.04	1.04E+02	1.03E+02	1.02E+02	1.02E+02	1.02E+02	1.02E+02	1.01E+02
0.06	1.04E+02	1.03E+02	1.02E+02	1.02E+02	1.01E+02	1.01E+02	1.00E+02
0.10	1.04E+02	1.03E+02	1.02E+02	1.01E+02	1.00E+02	9.98E+01	9.76E+01
0.20	1.04E+02	1.03E+02	1.01E+02	9.80E+01	9.53E+01	9.36E+01	8.73E+01
0.30	1.03E+02	1.03E+02	1.00E+02	9.35E+01	8.88E+01	8.59E+01	7.62E+01
0.40	1.03E+02	1.03E+02	9.89E+01	8.83E+01	8.18E+01	7.81E+01	6.60E+01
0.50	1.03E+02	1.02E+02	9.70E+01	8.29E+01	7.50E+01	7.06E+01	5.70E+01
0.60	1.03E+02	1.02E+02	9.49E+01	7.77E+01	6.86E+01	6.36E+01	4.92E+01
0.70	1.02E+02	1.02E+02	9.26E+01	7.26E+01	6.27E+01	5.74E+01	4.26E+01
0.80	1.02E+02	1.01E+02	9.01E+01	6.77E+01	5.72E+01	5.18E+01	3.71E+01
1.00	1.01E+02	9.97E+01	8.53E+01	5.89E+01	4.77E+01	4.23E+01	2.86E+01
1.20	1.00E+02	9.81E+01	8.03E+01	5.12E+01	3.99E+01	3.48E+01	2.26E+01
1.50	9.81E+01	9.55E+01	7.32E+01	4.16E+01	3.11E+01	2.66E+01	1.63E+01
1.70	9.67E+01	9.36E+01	6.86E+01	3.65E+01	2.67E+01	2.25E+01	1.31E+01
2.00	9.44E+01	9.06E+01	6.24E+01	3.03E+01	2.15E+01	1.77E+01	9.48E+00
2.50	9.03E+01	8.55E+01	5.30E+01	2.27E+01	1.53E+01	1.21E+01	5.66E+00
3.00	8.63E+01	8.05E+01	4.52E+01	1.73E+01	1.09E+01	8.35E+00	3.64E+00
3.50	8.21E+01	7.56E+01	3.87E+01	1.34E+01	7.85E+00	5.88E+00	2.60E+00
4.00	7.78E+01	7.08E+01	3.34E+01	1.03E+01	5.72E+00	4.28E+00	2.03E+00
5.00	6.94E+01	6.21E+01	2.54E+01	6.35E+00	3.35E+00	2.55E+00	1.36E+00
6.00	6.13E+01	5.44E+01	1.98E+01	4.14E+00	2.29E+00	1.76E+00	8.89E−01
7.00	5.43E+01	4.76E+01	1.55E+01	2.90E+00	1.75E+00	1.32E+00	5.58E−01
8.00	4.84E+01	4.18E+01	1.22E+01	2.17E+00	1.37E+00	1.00E+00	3.55E−01
9.00	4.37E+01	3.69E+01	9.65E+00	1.72E+00	1.06E+00	7.50E−01	2.37E−01
10.00	3.98E+01	3.27E+01	7.64E+00	1.40E+00	8.00E−01	5.51E−01	1.68E−01
12.50	3.20E+01	2.48E+01	4.45E+00	8.60E−01	3.89E−01	2.61E−01	9.42E−02
15.00	2.55E+01	1.91E+01	2.90E+00	5.14E−01	2.08E−01	1.43E−01	6.54E−02
17.50	1.99E+01	1.49E+01	2.12E+00	3.11E−01	1.30E−01	9.27E−02	4.70E−02
20.00	1.52E+01	1.16E+01	1.67E+00	1.98E−01	9.30E−02	6.78E−02	3.28E−02
22.50	1.16E+01	9.03E+00	1.33E+00	1.36E−01	7.26E−02	5.31E−02	2.22E−02
25.00	8.98E+00	7.06E+00	1.05E+00	9.98E−02	5.85E−02	4.23E−02	1.47E−02
27.50	7.09E+00	5.58E+00	8.20E−01	7.76E−02	4.73E−02	3.34E−02	9.67E−03
30.00	5.75E+00	4.47E+00	6.29E−01	6.28E−02	3.78E−02	2.58E−02	6.35E−03
35.00	4.04E+00	3.02E+00	3.72E−01	4.39E−02	2.32E−02	1.47E−02	2.78E−03
40.00	3.09E+00	2.20E+00	2.28E−01	3.12E−02	1.38E−02	8.12E−03	1.26E−03
45.00	2.48E+00	1.70E+00	1.50E−01	2.18E−02	8.15E−03	4.48E−03	6.02E−04
50.00	2.04E+00	1.35E+00	1.06E−01	1.49E−02	4.83E−03	2.51E−03	3.04E−04
55.00	1.67E+00	1.10E+00	7.92E−02	1.01E−02	2.91E−03	1.45E−03	1.64E−04
60.00	1.35E+00	8.87E−01	6.26E−02	6.85E−03	1.79E−03	8.62E−04	9.45E−05
65.00	1.08E+00	7.17E−01	5.13E−02	4.70E−03	1.14E−03	5.36E−04	5.86E−05
70.00	8.64E−01	5.82E−01	4.32E−02	3.28E−03	7.55E−04	3.49E−04	3.92E−05
75.00	6.93E−01	4.75E−01	3.71E−02	2.35E−03	5.20E−04	2.39E−04	2.83E−05
80.00	5.64E−01	3.94E−01	3.24E−02	1.74E−03	3.75E−04	1.72E−04	2.18E−05
85.00	4.68E−01	3.33E−01	2.88E−02	1.33E−03	2.83E−04	1.31E−04	1.78E−05
90.00	3.99E−01	2.88E−01	2.60E−02	1.06E−03	2.23E−04	1.04E−04	1.54E−05
95.00	3.48E−01	2.55E−01	2.39E−02	8.68E−04	1.83E−04	8.64E−05	1.38E−05
105.00	2.88E−01	2.16E−01	2.12E−02	6.40E−04	1.37E−04	6.61E−05	1.23E−05
120.00	2.54E−01	1.94E−01	1.94E−02	4.79E−04	1.05E−04	5.27E−05	1.18E−05
135.00	2.51E−01	1.92E−01	1.88E−02	4.06E−04	9.17E−05	4.73E−05	1.21E−05
150.00	2.58E−01	1.97E−01	1.86E−02	3.69E−04	8.53E−05	4.49E−05	1.26E−05
165.00	2.65E−01	2.03E−01	1.86E−02	3.51E−04	8.24E−05	4.40E−05	1.31E−05
180.00	2.68E−01	2.05E−01	1.86E−02	3.46E−04	8.15E−05	4.37E−05	1.33E−05
total	2.70E+01	2.08E+01	4.10E+00	9.18E−01	5.51E−01	4.27E−01	2.16E−01
rel ff	2.69E+01	2.01E+01	4.13E+00	9.37E−01	5.64E−01	4.39E−01	2.22E−01
nrl ff	2.73E+01	2.03E+01	4.21E+00	9.59E−01	5.77E−01	4.49E−01	2.27E−01

TABLE 1. Predicted *S*-matrix differential elastic scattering cross sections for photon energies (50.0, 59.54, 145.4, 316.5, 411.8, 468.1, 661.6, 778.9, 964.0, 1004.8, 1112.1, 1274.5, 1408.0 and 1500.0). The angle integrated total cross sections for each element and energies are presented. ''total'' represents total cross sections from this work, ''rel ff'' represents total cross sections calculated from the relativistic form factor and ''nrl ff'' represents total cross sections calculated from the nonrelativistic form factor—Continued[a]

θ (deg)	Photon energy (keV)						
	778.9	964.0	1004.8	1112.1	1274.5	1408.0	1500.0
Krypton ($Z=36$)							
0.00	1.02E+02	1.02E+02	1.02E+02	1.02E+02	1.02E+02	1.02E+02	1.02E+02
0.01	1.02E+02	1.02E+02	1.02E+02	1.02E+02	1.02E+02	1.02E+02	1.02E+02
0.02	1.02E+02	1.02E+02	1.02E+02	1.02E+02	1.01E+02	1.01E+02	1.01E+02
0.04	1.01E+02	1.01E+02	1.00E+02	1.00E+02	9.93E+01	9.85E+01	9.79E+01
0.06	9.97E+01	9.85E+01	9.82E+01	9.73E+01	9.60E+01	9.49E+01	9.42E+01
0.10	9.60E+01	9.31E+01	9.25E+01	9.07E+01	8.80E+01	8.58E+01	8.44E+01
0.20	8.33E+01	7.70E+01	7.56E+01	7.22E+01	6.73E+01	6.36E+01	6.13E+01
0.30	7.06E+01	6.24E+01	6.07E+01	5.65E+01	5.07E+01	4.65E+01	4.38E+01
0.40	5.94E+01	5.04E+01	4.86E+01	4.42E+01	3.85E+01	3.46E+01	3.22E+01
0.50	5.00E+01	4.08E+01	3.91E+01	3.50E+01	2.99E+01	2.65E+01	2.47E+01
0.60	4.22E+01	3.35E+01	3.19E+01	2.82E+01	2.37E+01	2.09E+01	1.93E+01
0.70	3.59E+01	2.78E+01	2.64E+01	2.30E+01	1.91E+01	1.65E+01	1.51E+01
0.80	3.08E+01	2.35E+01	2.21E+01	1.91E+01	1.55E+01	1.31E+01	1.17E+01
1.00	2.32E+01	1.70E+01	1.59E+01	1.34E+01	1.03E+01	8.14E+00	6.86E+00
1.20	1.78E+01	1.25E+01	1.15E+01	9.40E+00	6.87E+00	5.23E+00	4.28E+00
1.50	1.21E+01	7.80E+00	7.10E+00	5.59E+00	3.99E+00	3.09E+00	2.63E+00
1.70	9.43E+00	5.78E+00	5.22E+00	4.08E+00	2.97E+00	2.43E+00	2.21E+00
2.00	6.54E+00	3.86E+00	3.49E+00	2.74E+00	2.11E+00	1.90E+00	1.89E+00
2.50	3.85E+00	2.35E+00	2.14E+00	1.74E+00	1.40E+00	1.28E+00	1.25E+00
3.00	2.58E+00	1.72E+00	1.59E+00	1.32E+00	9.77E−01	7.24E−01	5.61E−01
3.50	1.91E+00	1.33E+00	1.24E+00	1.00E+00	6.60E−01	3.94E−01	2.43E−01
4.00	1.48E+00	9.97E−01	9.14E−01	7.12E−01	4.32E−01	2.39E−01	1.40E−01
5.00	9.13E−01	4.99E−01	4.38E−01	3.14E−01	1.93E−01	1.31E−01	1.01E−01
6.00	5.42E−01	2.57E−01	2.21E−01	1.56E−01	1.08E−01	9.69E−02	1.02E−01
7.00	3.26E−01	1.53E−01	1.33E−01	9.73E−02	7.48E−02	7.64E−02	9.01E−02
8.00	2.09E−01	1.06E−01	9.42E−02	7.28E−02	5.81E−02	5.68E−02	6.13E−02
9.00	1.45E−01	8.29E−02	7.54E−02	6.07E−02	4.68E−02	3.88E−02	3.39E−02
10.00	1.09E−01	6.92E−02	6.40E−02	5.26E−02	3.75E−02	2.52E−02	1.73E−02
12.50	6.61E−02	4.51E−02	4.16E−02	3.28E−02	1.89E−02	9.04E−03	4.40E−03
15.00	4.46E−02	2.60E−02	2.31E−02	1.62E−02	8.25E−03	3.87E−03	1.99E−03
17.50	2.96E−02	1.40E−02	1.18E−02	7.44E−03	3.50E−03	1.76E−03	1.05E−03
20.00	1.88E−02	7.45E−03	6.05E−03	3.49E−03	1.54E−03	8.09E−04	5.33E−04
22.50	1.16E−02	4.01E−03	3.16E−03	1.71E−03	7.11E−04	3.74E−04	2.54E−04
25.00	7.13E−03	2.20E−03	1.70E−03	8.79E−04	3.46E−04	1.77E−04	1.20E−04
27.50	4.37E−03	1.24E−03	9.44E−04	4.70E−04	1.77E−04	8.79E−05	5.81E−05
30.00	2.70E−03	7.15E−04	5.38E−04	2.61E−04	9.54E−05	4.61E−05	2.99E−05
35.00	1.07E−03	2.57E−04	1.91E−04	8.96E−05	3.14E−05	1.46E−05	9.16E−06
40.00	4.52E−04	1.03E−04	7.63E−05	3.59E−05	1.30E−05	6.26E−06	4.03E−06
45.00	2.07E−04	4.70E−05	3.51E−05	1.73E−05	6.93E−06	3.80E−06	2.72E−06
50.00	1.02E−04	2.41E−05	1.83E−05	9.57E−06	4.41E−06	2.81E−06	2.26E−06
55.00	5.55E−05	1.40E−05	1.09E−05	6.22E−06	3.38E−06	2.54E−06	2.33E−06
60.00	3.30E−05	9.28E−06	7.47E−06	4.67E−06	2.98E−06	2.58E−06	2.60E−06
65.00	2.15E−05	6.84E−06	5.68E−06	3.87E−06	2.79E−06	2.60E−06	2.70E−06
70.00	1.53E−05	5.58E−06	4.78E−06	3.52E−06	2.78E−06	2.67E−06	2.74E−06
75.00	1.18E−05	4.92E−06	4.35E−06	3.43E−06	2.90E−06	2.79E−06	2.75E−06
80.00	9.72E−06	4.56E−06	4.12E−06	3.44E−06	3.04E−06	2.87E−06	2.69E−06
85.00	8.50E−06	4.43E−06	4.08E−06	3.56E−06	3.24E−06	2.97E−06	2.65E−06
90.00	7.78E−06	4.43E−06	4.16E−06	3.76E−06	3.49E−06	3.12E−06	2.65E−06
95.00	7.37E−06	4.52E−06	4.30E−06	4.00E−06	3.75E−06	3.27E−06	2.66E−06
105.00	7.11E−06	4.89E−06	4.75E−06	4.59E−06	4.37E−06	3.66E−06	2.81E−06
120.00	7.44E−06	5.70E−06	5.63E−06	5.63E−06	5.41E−06	4.37E−06	3.19E−06
135.00	8.14E−06	6.72E−06	6.71E−06	6.83E−06	6.55E−06	5.12E−06	3.58E−06
150.00	8.86E−06	7.63E−06	7.66E−06	7.88E−06	7.56E−06	5.82E−06	4.00E−06
165.00	9.40E−06	8.28E−06	8.34E−06	8.63E−06	8.28E−06	6.34E−06	4.33E−06
180.00	9.59E−06	8.51E−06	8.59E−06	8.90E−06	8.55E−06	6.55E−06	4.47E−06
total	1.55E−01	1.02E−01	9.40E−02	7.70E−02	5.82E−02	4.74E−02	4.21E−02
rel ff	1.61E−01	1.05E−01	9.67E−02	7.89E−02	6.00E−02	4.93E−02	4.36E−02
nrl ff	1.65E−01	1.08E−01	9.92E−02	8.09E−02	6.15E−02	5.06E−02	4.47E−02

TABLE 1. Predicted *S*-matrix differential elastic scattering cross sections for photon energies (50.0, 59.54, 145.4, 316.5, 411.8, 468.1, 661.6, 778.9, 964.0, 1004.8, 1112.1, 1274.5, 1408.0 and 1500.0). The angle integrated total cross sections for each element and energies are presented. ''total'' represents total cross sections from this work, ''rel ff'' represents total cross sections calculated from the relativistic form factor and ''nrl ff'' represents total cross sections calculated from the nonrelativistic form factor—Continued[a]

θ (deg)	Photon energy (keV)						
	50.0	59.5	145.4	316.5	411.8	468.1	661.6
Rubidium ($Z=37$)							
0.00	1.10E+02	1.09E+02	1.08E+02	1.08E+02	1.08E+02	1.08E+02	1.08E+02
0.01	1.10E+02	1.09E+02	1.08E+02	1.08E+02	1.08E+02	1.08E+02	1.08E+02
0.02	1.10E+02	1.09E+02	1.08E+02	1.08E+02	1.08E+02	1.08E+02	1.08E+02
0.04	1.09E+02	1.09E+02	1.08E+02	1.08E+02	1.08E+02	1.08E+02	1.07E+02
0.06	1.09E+02	1.09E+02	1.08E+02	1.08E+02	1.07E+02	1.07E+02	1.06E+02
0.10	1.09E+02	1.09E+02	1.08E+02	1.07E+02	1.06E+02	1.05E+02	1.03E+02
0.20	1.09E+02	1.09E+02	1.07E+02	1.03E+02	1.01E+02	9.87E+01	9.20E+01
0.30	1.09E+02	1.09E+02	1.06E+02	9.86E+01	9.36E+01	9.06E+01	8.03E+01
0.40	1.09E+02	1.09E+02	1.04E+02	9.31E+01	8.62E+01	8.23E+01	6.95E+01
0.50	1.09E+02	1.08E+02	1.02E+02	8.74E+01	7.91E+01	7.44E+01	6.00E+01
0.60	1.09E+02	1.08E+02	1.00E+02	8.19E+01	7.22E+01	6.71E+01	5.19E+01
0.70	1.08E+02	1.07E+02	9.77E+01	7.65E+01	6.60E+01	6.05E+01	4.50E+01
0.80	1.08E+02	1.07E+02	9.51E+01	7.14E+01	6.03E+01	5.46E+01	3.92E+01
1.00	1.07E+02	1.05E+02	8.99E+01	6.20E+01	5.03E+01	4.46E+01	3.05E+01
1.20	1.06E+02	1.04E+02	8.47E+01	5.39E+01	4.22E+01	3.69E+01	2.43E+01
1.50	1.04E+02	1.01E+02	7.72E+01	4.40E+01	3.30E+01	2.84E+01	1.76E+01
1.70	1.02E+02	9.88E+01	7.23E+01	3.86E+01	2.85E+01	2.41E+01	1.43E+01
2.00	9.96E+01	9.56E+01	6.58E+01	3.22E+01	2.31E+01	1.92E+01	1.04E+01
2.50	9.53E+01	9.02E+01	5.59E+01	2.43E+01	1.66E+01	1.32E+01	6.14E+00
3.00	9.10E+01	8.49E+01	4.77E+01	1.87E+01	1.19E+01	9.11E+00	3.90E+00
3.50	8.67E+01	7.97E+01	4.09E+01	1.45E+01	8.57E+00	6.39E+00	2.75E+00
4.00	8.21E+01	7.46E+01	3.54E+01	1.13E+01	6.20E+00	4.62E+00	2.14E+00
5.00	7.31E+01	6.55E+01	2.71E+01	6.91E+00	3.57E+00	2.72E+00	1.46E+00
6.00	6.44E+01	5.73E+01	2.13E+01	4.46E+00	2.43E+00	1.86E+00	9.72E−01
7.00	5.69E+01	5.03E+01	1.69E+01	3.09E+00	1.86E+00	1.41E+00	6.17E−01
8.00	5.07E+01	4.42E+01	1.34E+01	2.31E+00	1.47E+00	1.08E+00	3.92E−01
9.00	4.58E+01	3.91E+01	1.06E+01	1.82E+00	1.15E+00	8.19E−01	2.60E−01
10.00	4.19E+01	3.47E+01	8.34E+00	1.49E+00	8.78E−01	6.07E−01	1.83E−01
12.50	3.42E+01	2.65E+01	4.80E+00	9.34E−01	4.30E−01	2.88E−01	9.99E−02
15.00	2.77E+01	2.06E+01	3.09E+00	5.66E−01	2.27E−01	1.56E−01	6.92E−02
17.50	2.18E+01	1.62E+01	2.25E+00	3.43E−01	1.39E−01	9.89E−02	5.02E−02
20.00	1.67E+01	1.26E+01	1.77E+00	2.17E−01	9.87E−02	7.18E−02	3.55E−02
22.50	1.27E+01	9.87E+00	1.43E+00	1.47E−01	7.68E−02	5.62E−02	2.44E−02
25.00	9.81E+00	7.71E+00	1.14E+00	1.07E−01	6.20E−02	4.51E−02	1.64E−02
27.50	7.68E+00	6.06E+00	8.98E−01	8.27E−02	5.04E−02	3.59E−02	1.09E−02
30.00	6.17E+00	4.83E+00	6.94E−01	6.67E−02	4.06E−02	2.80E−02	7.23E−03
35.00	4.28E+00	3.23E+00	4.12E−01	4.67E−02	2.54E−02	1.63E−02	3.21E−03
40.00	3.25E+00	2.33E+00	2.52E−01	3.35E−02	1.54E−02	9.17E−03	1.48E−03
45.00	2.62E+00	1.80E+00	1.63E−01	2.37E−02	9.20E−03	5.13E−03	7.10E−04
50.00	2.17E+00	1.44E+00	1.14E−01	1.64E−02	5.51E−03	2.90E−03	3.60E−04
55.00	1.79E+00	1.17E+00	8.48E−02	1.13E−02	3.35E−03	1.69E−03	1.94E−04
60.00	1.47E+00	9.57E−01	6.66E−02	7.72E−03	2.08E−03	1.01E−03	1.12E−04
65.00	1.19E+00	7.81E−01	5.45E−02	5.34E−03	1.33E−03	6.32E−04	6.94E−05
70.00	9.56E−01	6.37E−01	4.59E−02	3.76E−03	8.87E−04	4.13E−04	4.62E−05
75.00	7.72E−01	5.24E−01	3.95E−02	2.72E−03	6.14E−04	2.83E−04	3.32E−05
80.00	6.31E−01	4.36E−01	3.46E−02	2.02E−03	4.44E−04	2.05E−04	2.54E−05
85.00	5.25E−01	3.70E−01	3.09E−02	1.56E−03	3.36E−04	1.55E−04	2.08E−05
90.00	4.47E−01	3.20E−01	2.80E−02	1.24E−03	2.65E−04	1.24E−04	1.78E−05
95.00	3.91E−01	2.84E−01	2.59E−02	1.02E−03	2.18E−04	1.03E−04	1.60E−05
105.00	3.22E−01	2.39E−01	2.32E−02	7.56E−04	1.63E−04	7.85E−05	1.41E−05
120.00	2.82E−01	2.14E−01	2.14E−02	5.69E−04	1.25E−04	6.24E−05	1.34E−05
135.00	2.76E−01	2.11E−01	2.09E−02	4.83E−04	1.09E−04	5.57E−05	1.36E−05
150.00	2.82E−01	2.16E−01	2.08E−02	4.39E−04	1.01E−04	5.27E−05	1.42E−05
165.00	2.89E−01	2.21E−01	2.09E−02	4.18E−04	9.73E−05	5.15E−05	1.46E−05
180.00	2.92E−01	2.23E−01	2.09E−02	4.12E−04	9.62E−05	5.11E−05	1.48E−05
total	2.91E+01	2.24E+01	4.41E+00	9.87E−01	5.93E−01	4.59E−01	2.32E−01
rel ff	2.89E+01	2.15E+01	4.43E+00	1.01E+00	6.06E−01	4.72E−01	2.38E−01
nrl ff	2.93E+01	2.18E+01	4.52E+00	1.03E+00	6.21E−01	4.84E−01	2.45E−01

TABLE 1. Predicted *S*-matrix differential elastic scattering cross sections for photon energies (50.0, 59.54, 145.4, 316.5, 411.8, 468.1, 661.6, 778.9, 964.0, 1004.8, 1112.1, 1274.5, 1408.0 and 1500.0). The angle integrated total cross sections for each element and energies are presented. ''total'' represents total cross sections from this work, ''rel ff'' represents total cross sections calculated from the relativistic form factor and ''nrl ff'' represents total cross sections calculated from the nonrelativistic form factor—Continued[a]

θ (deg)	Photon energy (keV)						
	778.9	964.0	1004.8	1112.1	1274.5	1408.0	1500.0
Rubidium ($Z=37$)							
0.00	1.08E+02	1.08E+02	1.08E+02	1.08E+02	1.08E+02	1.08E+02	1.08E+02
0.01	1.08E+02	1.08E+02	1.08E+02	1.08E+02	1.08E+02	1.08E+02	1.08E+02
0.02	1.08E+02	1.07E+02	1.07E+02	1.07E+02	1.07E+02	1.07E+02	1.06E+02
0.04	1.07E+02	1.06E+02	1.06E+02	1.06E+02	1.05E+02	1.04E+02	1.03E+02
0.06	1.05E+02	1.04E+02	1.04E+02	1.03E+02	1.01E+02	1.00E+02	9.93E+01
0.10	1.01E+02	9.82E+01	9.75E+01	9.57E+01	9.28E+01	9.05E+01	8.89E+01
0.20	8.78E+01	8.11E+01	7.97E+01	7.61E+01	7.09E+01	6.70E+01	6.45E+01
0.30	7.44E+01	6.58E+01	6.40E+01	5.95E+01	5.34E+01	4.90E+01	4.62E+01
0.40	6.26E+01	5.31E+01	5.12E+01	4.66E+01	4.07E+01	3.66E+01	3.42E+01
0.50	5.27E+01	4.31E+01	4.13E+01	3.70E+01	3.17E+01	2.83E+01	2.64E+01
0.60	4.46E+01	3.55E+01	3.38E+01	3.00E+01	2.53E+01	2.24E+01	2.09E+01
0.70	3.80E+01	2.96E+01	2.81E+01	2.47E+01	2.05E+01	1.79E+01	1.65E+01
0.80	3.27E+01	2.51E+01	2.38E+01	2.06E+01	1.68E+01	1.43E+01	1.28E+01
1.00	2.49E+01	1.84E+01	1.73E+01	1.46E+01	1.12E+01	8.87E+00	7.43E+00
1.20	1.93E+01	1.36E+01	1.26E+01	1.03E+01	7.49E+00	5.63E+00	4.55E+00
1.50	1.32E+01	8.52E+00	7.75E+00	6.08E+00	4.29E+00	3.27E+00	2.75E+00
1.70	1.03E+01	6.27E+00	5.66E+00	4.39E+00	3.16E+00	2.57E+00	2.32E+00
2.00	7.12E+00	4.14E+00	3.73E+00	2.91E+00	2.23E+00	2.02E+00	2.04E+00
2.50	4.13E+00	2.48E+00	2.26E+00	1.83E+00	1.49E+00	1.40E+00	1.42E+00
3.00	2.74E+00	1.82E+00	1.68E+00	1.40E+00	1.06E+00	8.06E−01	6.39E−01
3.50	2.02E+00	1.43E+00	1.33E+00	1.09E+00	7.27E−01	4.36E−01	2.68E−01
4.00	1.58E+00	1.09E+00	1.00E+00	7.89E−01	4.80E−01	2.61E−01	1.48E−01
5.00	9.94E−01	5.55E−01	4.89E−01	3.51E−01	2.12E−01	1.38E−01	1.02E−01
6.00	5.98E−01	2.84E−01	2.44E−01	1.71E−01	1.16E−01	1.01E−01	1.05E−01
7.00	3.59E−01	1.66E−01	1.43E−01	1.03E−01	7.89E−02	8.13E−02	9.76E−02
8.00	2.28E−01	1.13E−01	9.94E−02	7.59E−02	6.09E−02	6.17E−02	6.98E−02
9.00	1.57E−01	8.72E−02	7.88E−02	6.31E−02	4.94E−02	4.28E−02	3.95E−02
10.00	1.17E−01	7.27E−02	6.71E−02	5.51E−02	4.01E−02	2.81E−02	2.02E−02
12.50	7.00E−02	4.83E−02	4.48E−02	3.57E−02	2.10E−02	1.01E−02	4.95E−03
15.00	4.76E−02	2.86E−02	2.55E−02	1.83E−02	9.43E−03	4.39E−03	2.21E−03
17.50	3.21E−02	1.57E−02	1.34E−02	8.55E−03	4.07E−03	2.03E−03	1.19E−03
20.00	2.08E−02	8.49E−03	6.94E−03	4.06E−03	1.81E−03	9.48E−04	6.16E−04
22.50	1.31E−02	4.62E−03	3.67E−03	2.01E−03	8.44E−04	4.43E−04	3.00E−04
25.00	8.10E−03	2.57E−03	1.99E−03	1.04E−03	4.13E−04	2.12E−04	1.43E−04
27.50	5.02E−03	1.45E−03	1.11E−03	5.58E−04	2.12E−04	1.05E−04	6.96E−05
30.00	3.13E−03	8.44E−04	6.37E−04	3.11E−04	1.14E−04	5.51E−05	3.57E−05
35.00	1.26E−03	3.05E−04	2.26E−04	1.06E−04	3.72E−05	1.72E−05	1.08E−05
40.00	5.36E−04	1.23E−04	9.05E−05	4.24E−05	1.51E−05	7.17E−06	4.56E−06
45.00	2.46E−04	5.56E−05	4.13E−05	2.01E−05	7.88E−06	4.22E−06	2.97E−06
50.00	1.22E−04	2.82E−05	2.13E−05	1.10E−05	4.91E−06	3.04E−06	2.41E−06
55.00	6.55E−05	1.62E−05	1.26E−05	7.01E−06	3.70E−06	2.72E−06	2.46E−06
60.00	3.87E−05	1.06E−05	8.46E−06	5.18E−06	3.22E−06	2.75E−06	2.77E−06
65.00	2.50E−05	7.72E−06	6.36E−06	4.24E−06	2.99E−06	2.77E−06	2.90E−06
70.00	1.77E−05	6.23E−06	5.30E−06	3.82E−06	2.97E−06	2.86E−06	2.97E−06
75.00	1.36E−05	5.46E−06	4.78E−06	3.70E−06	3.08E−06	2.99E−06	3.01E−06
80.00	1.11E−05	5.02E−06	4.51E−06	3.69E−06	3.22E−06	3.08E−06	2.96E−06
85.00	9.69E−06	4.86E−06	4.45E−06	3.82E−06	3.44E−06	3.20E−06	2.91E−06
90.00	8.83E−06	4.85E−06	4.52E−06	4.03E−06	3.70E−06	3.36E−06	2.91E−06
95.00	8.33E−06	4.93E−06	4.66E−06	4.27E−06	3.98E−06	3.52E−06	2.93E−06
105.00	7.98E−06	5.31E−06	5.13E−06	4.90E−06	4.64E−06	3.94E−06	3.08E−06
120.00	8.27E−06	6.17E−06	6.06E−06	6.00E−06	5.74E−06	4.68E−06	3.46E−06
135.00	9.00E−06	7.24E−06	7.20E−06	7.28E−06	6.96E−06	5.47E−06	3.86E−06
150.00	9.74E−06	8.20E−06	8.21E−06	8.38E−06	8.01E−06	6.20E−06	4.29E−06
165.00	1.03E−05	8.88E−06	8.92E−06	9.17E−06	8.78E−06	6.74E−06	4.63E−06
180.00	1.05E−05	9.12E−06	9.18E−06	9.46E−06	9.06E−06	6.96E−06	4.77E−06
total	1.67E−01	1.10E−01	1.01E−01	8.29E−02	6.27E−02	5.10E−02	4.54E−02
rel ff	1.73E−01	1.13E−01	1.04E−01	8.49E−02	6.46E−02	5.31E−02	4.69E−02
nrl ff	1.77E−01	1.16E−01	1.07E−01	8.72E−02	6.63E−02	5.45E−02	4.81E−02

TABLE 1. Predicted *S*-matrix differential elastic scattering cross sections for photon energies (50.0, 59.54, 145.4, 316.5, 411.8, 468.1, 661.6, 778.9, 964.0, 1004.8, 1112.1, 1274.5, 1408.0 and 1500.0). The angle integrated total cross sections for each element and energies are presented. ''total'' represents total cross sections from this work, ''rel ff'' represents total cross sections calculated from the relativistic form factor and ''nrl ff'' represents total cross sections calculated from the nonrelativistic form factor—Continued[a]

θ (deg)	Photon energy (keV)						
	50.0	59.5	145.4	316.5	411.8	468.1	661.6
Strontium ($Z=38$)							
0.00	1.16E+02	1.15E+02	1.14E+02	1.14E+02	1.14E+02	1.14E+02	1.14E+02
0.01	1.16E+02	1.15E+02	1.14E+02	1.14E+02	1.14E+02	1.14E+02	1.14E+02
0.02	1.16E+02	1.15E+02	1.14E+02	1.14E+02	1.14E+02	1.14E+02	1.14E+02
0.04	1.15E+02	1.15E+02	1.14E+02	1.14E+02	1.13E+02	1.13E+02	1.13E+02
0.06	1.15E+02	1.15E+02	1.14E+02	1.13E+02	1.13E+02	1.13E+02	1.12E+02
0.10	1.15E+02	1.15E+02	1.14E+02	1.12E+02	1.12E+02	1.11E+02	1.09E+02
0.20	1.15E+02	1.15E+02	1.13E+02	1.09E+02	1.06E+02	1.04E+02	9.69E+01
0.30	1.15E+02	1.15E+02	1.12E+02	1.04E+02	9.86E+01	9.55E+01	8.46E+01
0.40	1.15E+02	1.15E+02	1.10E+02	9.81E+01	9.09E+01	8.67E+01	7.32E+01
0.50	1.15E+02	1.14E+02	1.08E+02	9.21E+01	8.33E+01	7.84E+01	6.32E+01
0.60	1.14E+02	1.14E+02	1.06E+02	8.62E+01	7.61E+01	7.06E+01	5.47E+01
0.70	1.14E+02	1.13E+02	1.03E+02	8.06E+01	6.96E+01	6.38E+01	4.75E+01
0.80	1.14E+02	1.12E+02	1.00E+02	7.52E+01	6.35E+01	5.75E+01	4.14E+01
1.00	1.13E+02	1.11E+02	9.47E+01	6.53E+01	5.30E+01	4.71E+01	3.23E+01
1.20	1.11E+02	1.09E+02	8.93E+01	5.68E+01	4.45E+01	3.90E+01	2.59E+01
1.50	1.09E+02	1.06E+02	8.13E+01	4.64E+01	3.50E+01	3.02E+01	1.90E+01
1.70	1.08E+02	1.04E+02	7.62E+01	4.08E+01	3.03E+01	2.58E+01	1.55E+01
2.00	1.05E+02	1.01E+02	6.93E+01	3.41E+01	2.47E+01	2.06E+01	1.13E+01
2.50	1.00E+02	9.51E+01	5.89E+01	2.60E+01	1.80E+01	1.43E+01	6.65E+00
3.00	9.60E+01	8.94E+01	5.03E+01	2.02E+01	1.30E+01	9.90E+00	4.18E+00
3.50	9.14E+01	8.40E+01	4.32E+01	1.57E+01	9.31E+00	6.93E+00	2.93E+00
4.00	8.66E+01	7.86E+01	3.75E+01	1.23E+01	6.72E+00	4.98E+00	2.27E+00
5.00	7.70E+01	6.90E+01	2.89E+01	7.50E+00	3.82E+00	2.90E+00	1.56E+00
6.00	6.78E+01	6.04E+01	2.29E+01	4.80E+00	2.58E+00	1.98E+00	1.06E+00
7.00	5.98E+01	5.30E+01	1.82E+01	3.31E+00	1.97E+00	1.50E+00	6.78E−01
8.00	5.32E+01	4.67E+01	1.45E+01	2.46E+00	1.57E+00	1.17E+00	4.32E−01
9.00	4.81E+01	4.13E+01	1.15E+01	1.94E+00	1.24E+00	8.90E−01	2.84E−01
10.00	4.41E+01	3.68E+01	9.07E+00	1.59E+00	9.56E−01	6.64E−01	1.98E−01
12.50	3.64E+01	2.82E+01	5.18E+00	1.01E+00	4.74E−01	3.17E−01	1.06E−01
15.00	2.98E+01	2.22E+01	3.30E+00	6.19E−01	2.48E−01	1.69E−01	7.32E−02
17.50	2.37E+01	1.75E+01	2.39E+00	3.76E−01	1.50E−01	1.06E−01	5.34E−02
20.00	1.83E+01	1.37E+01	1.88E+00	2.38E−01	1.05E−01	7.61E−02	3.83E−02
22.50	1.39E+01	1.07E+01	1.53E+00	1.60E−01	8.12E−02	5.95E−02	2.66E−02
25.00	1.07E+01	8.38E+00	1.23E+00	1.15E−01	6.56E−02	4.79E−02	1.81E−02
27.50	8.32E+00	6.57E+00	9.76E−01	8.82E−02	5.36E−02	3.84E−02	1.22E−02
30.00	6.64E+00	5.22E+00	7.61E−01	7.09E−02	4.34E−02	3.03E−02	8.18E−03
35.00	4.55E+00	3.46E+00	4.54E−01	4.96E−02	2.76E−02	1.80E−02	3.69E−03
40.00	3.43E+00	2.49E+00	2.77E−01	3.58E−02	1.70E−02	1.03E−02	1.72E−03
45.00	2.76E+00	1.91E+00	1.78E−01	2.56E−02	1.03E−02	5.83E−03	8.33E−04
50.00	2.30E+00	1.54E+00	1.23E−01	1.80E−02	6.25E−03	3.34E−03	4.25E−04
55.00	1.92E+00	1.25E+00	9.09E−02	1.25E−02	3.83E−03	1.95E−03	2.29E−04
60.00	1.58E+00	1.03E+00	7.11E−02	8.64E−03	2.40E−03	1.18E−03	1.32E−04
65.00	1.29E+00	8.45E−01	5.79E−02	6.03E−03	1.55E−03	7.41E−04	8.17E−05
70.00	1.05E+00	6.94E−01	4.87E−02	4.28E−03	1.04E−03	4.86E−04	5.43E−05
75.00	8.52E−01	5.73E−01	4.20E−02	3.11E−03	7.20E−04	3.34E−04	3.89E−05
80.00	7.00E−01	4.79E−01	3.69E−02	2.33E−03	5.22E−04	2.42E−04	2.97E−05
85.00	5.85E−01	4.07E−01	3.30E−02	1.80E−03	3.96E−04	1.84E−04	2.41E−05
90.00	4.99E−01	3.54E−01	3.01E−02	1.44E−03	3.13E−04	1.46E−04	2.07E−05
95.00	4.36E−01	3.14E−01	2.79E−02	1.19E−03	2.58E−04	1.22E−04	1.85E−05
105.00	3.59E−01	2.64E−01	2.51E−02	8.89E−04	1.93E−04	9.28E−05	1.62E−05
120.00	3.12E−01	2.35E−01	2.35E−02	6.72E−04	1.48E−04	7.35E−05	1.52E−05
135.00	3.04E−01	2.31E−01	2.31E−02	5.71E−04	1.29E−04	6.54E−05	1.54E−05
150.00	3.09E−01	2.36E−01	2.31E−02	5.20E−04	1.19E−04	6.17E−05	1.59E−05
165.00	3.16E−01	2.41E−01	2.32E−02	4.95E−04	1.15E−04	6.01E−05	1.64E−05
180.00	3.19E−01	2.43E−01	2.33E−02	4.88E−04	1.13E−04	5.97E−05	1.66E−05
total	3.12E+01	2.41E+01	4.74E+00	1.06E+00	6.37E−01	4.93E−01	2.49E−01
rel ff	3.09E+01	2.30E+01	4.74E+00	1.08E+00	6.50E−01	5.06E−01	2.56E−01
nrl ff	3.14E+01	2.34E+01	4.84E+00	1.11E+00	6.68E−01	5.20E−01	2.63E−01

TABLE 1. Predicted *S*-matrix differential elastic scattering cross sections for photon energies (50.0, 59.54, 145.4, 316.5, 411.8, 468.1, 661.6, 778.9, 964.0, 1004.8, 1112.1, 1274.5, 1408.0 and 1500.0). The angle integrated total cross sections for each element and energies are presented. ''total'' represents total cross sections from this work, ''rel ff'' represents total cross sections calculated from the relativistic form factor and ''nrl ff'' represents total cross sections calculated from the nonrelativistic form factor—Continued[a]

θ (deg)	Photon energy (keV)						
	778.9	964.0	1004.8	1112.1	1274.5	1408.0	1500.0
Strontium ($Z=38$)							
0.00	1.14*E*+02	1.14*E*+02	1.14*E*+02	1.14*E*+02	1.14*E*+02	1.14*E*+02	1.14*E*+02
0.01	1.14*E*+02	1.14*E*+02	1.14*E*+02	1.14*E*+02	1.13*E*+02	1.13*E*+02	1.13*E*+02
0.02	1.13*E*+02	1.13*E*+02	1.13*E*+02	1.13*E*+02	1.13*E*+02	1.12*E*+02	1.12*E*+02
0.04	1.12*E*+02	1.12*E*+02	1.12*E*+02	1.11*E*+02	1.11*E*+02	1.10*E*+02	1.09*E*+02
0.06	1.11*E*+02	1.10*E*+02	1.09*E*+02	1.08*E*+02	1.07*E*+02	1.06*E*+02	1.05*E*+02
0.10	1.07*E*+02	1.04*E*+02	1.03*E*+02	1.01*E*+02	9.78*E*+01	9.53*E*+01	9.37*E*+01
0.20	9.25*E*+01	8.55*E*+01	8.40*E*+01	8.01*E*+01	7.46*E*+01	7.05*E*+01	6.79*E*+01
0.30	7.84*E*+01	6.93*E*+01	6.74*E*+01	6.27*E*+01	5.63*E*+01	5.17*E*+01	4.87*E*+01
0.40	6.60*E*+01	5.59*E*+01	5.40*E*+01	4.92*E*+01	4.30*E*+01	3.87*E*+01	3.62*E*+01
0.50	5.56*E*+01	4.55*E*+01	4.36*E*+01	3.91*E*+01	3.36*E*+01	3.01*E*+01	2.82*E*+01
0.60	4.70*E*+01	3.75*E*+01	3.58*E*+01	3.18*E*+01	2.70*E*+01	2.40*E*+01	2.24*E*+01
0.70	4.02*E*+01	3.15*E*+01	2.99*E*+01	2.63*E*+01	2.20*E*+01	1.93*E*+01	1.78*E*+01
0.80	3.47*E*+01	2.68*E*+01	2.54*E*+01	2.21*E*+01	1.81*E*+01	1.55*E*+01	1.39*E*+01
1.00	2.65*E*+01	1.99*E*+01	1.87*E*+01	1.58*E*+01	1.22*E*+01	9.63*E*+00	8.05*E*+00
1.20	2.07*E*+01	1.48*E*+01	1.37*E*+01	1.12*E*+01	8.14*E*+00	6.08*E*+00	4.86*E*+00
1.50	1.43*E*+01	9.27*E*+00	8.43*E*+00	6.61*E*+00	4.62*E*+00	3.48*E*+00	2.89*E*+00
1.70	1.12*E*+01	6.80*E*+00	6.13*E*+00	4.73*E*+00	3.38*E*+00	2.72*E*+00	2.45*E*+00
2.00	7.72*E*+00	4.45*E*+00	3.99*E*+00	3.10*E*+00	2.36*E*+00	2.15*E*+00	2.19*E*+00
2.50	4.44*E*+00	2.62*E*+00	2.39*E*+00	1.93*E*+00	1.58*E*+00	1.52*E*+00	1.58*E*+00
3.00	2.92*E*+00	1.92*E*+00	1.78*E*+00	1.49*E*+00	1.14*E*+00	8.89*E*−01	7.24*E*−01
3.50	2.15*E*+00	1.53*E*+00	1.43*E*+00	1.18*E*+00	7.95*E*−01	4.82*E*−01	2.99*E*−01
4.00	1.69*E*+00	1.18*E*+00	1.09*E*+00	8.66*E*−01	5.29*E*−01	2.85*E*−01	1.59*E*−01
5.00	1.08*E*+00	6.13*E*−01	5.42*E*−01	3.91*E*−01	2.33*E*−01	1.46*E*−01	1.03*E*−01
6.00	6.55*E*−01	3.13*E*−01	2.69*E*−01	1.87*E*−01	1.25*E*−01	1.06*E*−01	1.06*E*−01
7.00	3.95*E*−01	1.79*E*−01	1.54*E*−01	1.11*E*−01	8.34*E*−02	8.60*E*−02	1.04*E*−01
8.00	2.49*E*−01	1.20*E*−01	1.05*E*−01	7.97*E*−02	6.40*E*−02	6.65*E*−02	7.80*E*−02
9.00	1.70*E*−01	9.19*E*−02	8.27*E*−02	6.57*E*−02	5.20*E*−02	4.69*E*−02	4.54*E*−02
10.00	1.25*E*−01	7.64*E*−02	7.03*E*−02	5.76*E*−02	4.26*E*−02	3.11*E*−02	2.33*E*−02
12.50	7.41*E*−02	5.15*E*−02	4.79*E*−02	3.86*E*−02	2.31*E*−02	1.14*E*−02	5.60*E*−03
15.00	5.07*E*−02	3.12*E*−02	2.80*E*−02	2.04*E*−02	1.07*E*−02	4.96*E*−03	2.46*E*−03
17.50	3.46*E*−02	1.75*E*−02	1.50*E*−02	9.76*E*−03	4.70*E*−03	2.33*E*−03	1.34*E*−03
20.00	2.28*E*−02	9.61*E*−03	7.90*E*−03	4.70*E*−03	2.12*E*−03	1.10*E*−03	7.05*E*−04
22.50	1.45*E*−02	5.30*E*−03	4.23*E*−03	2.35*E*−03	9.95*E*−04	5.21*E*−04	3.49*E*−04
25.00	9.14*E*−03	2.97*E*−03	2.32*E*−03	1.22*E*−03	4.89*E*−04	2.51*E*−04	1.69*E*−04
27.50	5.72*E*−03	1.70*E*−03	1.30*E*−03	6.58*E*−04	2.51*E*−04	1.25*E*−04	8.28*E*−05
30.00	3.60*E*−03	9.90*E*−04	7.50*E*−04	3.68*E*−04	1.35*E*−04	6.56*E*−05	4.25*E*−05
35.00	1.46*E*−03	3.60*E*−04	2.68*E*−04	1.26*E*−04	4.39*E*−05	2.03*E*−05	1.26*E*−05
40.00	6.30*E*−04	1.45*E*−04	1.07*E*−04	4.99*E*−05	1.75*E*−05	8.22*E*−06	5.18*E*−06
45.00	2.90*E*−04	6.54*E*−05	4.85*E*−05	2.33*E*−05	8.96*E*−06	4.70*E*−06	3.25*E*−06
50.00	1.43*E*−04	3.29*E*−05	2.48*E*−05	1.26*E*−05	5.47*E*−06	3.31*E*−06	2.58*E*−06
55.00	7.72*E*−05	1.87*E*−05	1.44*E*−05	7.91*E*−06	4.06*E*−06	2.92*E*−06	2.62*E*−06
60.00	4.54*E*−05	1.21*E*−05	9.59*E*−06	5.76*E*−06	3.49*E*−06	2.94*E*−06	2.95*E*−06
65.00	2.92*E*−05	8.72*E*−06	7.13*E*−06	4.66*E*−06	3.21*E*−06	2.96*E*−06	3.12*E*−06
70.00	2.05*E*−05	6.98*E*−06	5.88*E*−06	4.17*E*−06	3.18*E*−06	3.06*E*−06	3.23*E*−06
75.00	1.57*E*−05	6.06*E*−06	5.27*E*−06	4.00*E*−06	3.29*E*−06	3.21*E*−06	3.28*E*−06
80.00	1.28*E*−05	5.55*E*−06	4.94*E*−06	3.98*E*−06	3.43*E*−06	3.31*E*−06	3.24*E*−06
85.00	1.10*E*−05	5.35*E*−06	4.86*E*−06	4.10*E*−06	3.66*E*−06	3.44*E*−06	3.20*E*−06
90.00	1.00*E*−05	5.32*E*−06	4.92*E*−06	4.32*E*−06	3.94*E*−06	3.61*E*−06	3.20*E*−06
95.00	9.42*E*−06	5.40*E*−06	5.07*E*−06	4.58*E*−06	4.23*E*−06	3.78*E*−06	3.21*E*−06
105.00	8.98*E*−06	5.79*E*−06	5.55*E*−06	5.24*E*−06	4.93*E*−06	4.23*E*−06	3.37*E*−06
120.00	9.22*E*−06	6.68*E*−06	6.53*E*−06	6.40*E*−06	6.10*E*−06	5.02*E*−06	3.76*E*−06
135.00	9.96*E*−06	7.81*E*−06	7.74*E*−06	7.75*E*−06	7.38*E*−06	5.84*E*−06	4.16*E*−06
150.00	1.07*E*−05	8.82*E*−06	8.79*E*−06	8.92*E*−06	8.49*E*−06	6.60*E*−06	4.61*E*−06
165.00	1.13*E*−05	9.53*E*−06	9.55*E*−06	9.75*E*−06	9.29*E*−06	7.17*E*−06	4.95*E*−06
180.00	1.15*E*−05	9.79*E*−06	9.82*E*−06	1.00*E*−05	9.59*E*−06	7.39*E*−06	5.10*E*−06
total	1.80*E*−01	1.18*E*−01	1.09*E*−01	8.90*E*−02	6.73*E*−02	5.48*E*−02	4.89*E*−02
rel ff	1.85*E*−01	1.21*E*−01	1.12*E*−01	9.11*E*−02	6.93*E*−02	5.69*E*−02	5.03*E*−02
nrl ff	1.91*E*−01	1.25*E*−01	1.15*E*−01	9.37*E*−02	7.13*E*−02	5.86*E*−02	5.18*E*−02

TABLE 1. Predicted *S*-matrix differential elastic scattering cross sections for photon energies (50.0, 59.54, 145.4, 316.5, 411.8, 468.1, 661.6, 778.9, 964.0, 1004.8, 1112.1, 1274.5, 1408.0 and 1500.0). The angle integrated total cross sections for each element and energies are presented. ''total'' represents total cross sections from this work, ''rel ff'' represents total cross sections calculated from the relativistic form factor and ''nrl ff'' represents total cross sections calculated from the nonrelativistic form factor—Continued[a]

θ (deg)	Photon energy (keV)						
	50.0	59.5	145.4	316.5	411.8	468.1	661.6
Yttrium ($Z=39$)							
0.00	1.22E+02	1.22E+02	1.20E+02	1.20E+02	1.20E+02	1.20E+02	1.20E+02
0.01	1.22E+02	1.22E+02	1.20E+02	1.20E+02	1.20E+02	1.20E+02	1.20E+02
0.02	1.22E+02	1.21E+02	1.20E+02	1.20E+02	1.20E+02	1.20E+02	1.20E+02
0.04	1.22E+02	1.21E+02	1.20E+02	1.20E+02	1.20E+02	1.19E+02	1.19E+02
0.06	1.22E+02	1.21E+02	1.20E+02	1.19E+02	1.19E+02	1.19E+02	1.18E+02
0.10	1.22E+02	1.21E+02	1.20E+02	1.18E+02	1.18E+02	1.17E+02	1.14E+02
0.20	1.22E+02	1.21E+02	1.19E+02	1.15E+02	1.12E+02	1.10E+02	1.02E+02
0.30	1.21E+02	1.21E+02	1.18E+02	1.09E+02	1.04E+02	1.00E+02	8.90E+01
0.40	1.21E+02	1.21E+02	1.16E+02	1.03E+02	9.56E+01	9.12E+01	7.71E+01
0.50	1.21E+02	1.20E+02	1.14E+02	9.69E+01	8.77E+01	8.25E+01	6.66E+01
0.60	1.21E+02	1.20E+02	1.11E+02	9.08E+01	8.01E+01	7.44E+01	5.76E+01
0.70	1.20E+02	1.19E+02	1.08E+02	8.48E+01	7.33E+01	6.71E+01	5.00E+01
0.80	1.20E+02	1.18E+02	1.05E+02	7.91E+01	6.69E+01	6.06E+01	4.37E+01
1.00	1.19E+02	1.17E+02	9.97E+01	6.88E+01	5.58E+01	4.96E+01	3.43E+01
1.20	1.17E+02	1.15E+02	9.40E+01	5.99E+01	4.70E+01	4.12E+01	2.76E+01
1.50	1.15E+02	1.12E+02	8.56E+01	4.90E+01	3.70E+01	3.20E+01	2.04E+01
1.70	1.13E+02	1.10E+02	8.03E+01	4.31E+01	3.21E+01	2.74E+01	1.67E+01
2.00	1.11E+02	1.06E+02	7.30E+01	3.61E+01	2.64E+01	2.20E+01	1.22E+01
2.50	1.06E+02	1.00E+02	6.21E+01	2.76E+01	1.93E+01	1.54E+01	7.19E+00
3.00	1.01E+02	9.42E+01	5.30E+01	2.16E+01	1.40E+01	1.07E+01	4.49E+00
3.50	9.63E+01	8.84E+01	4.56E+01	1.69E+01	1.01E+01	7.50E+00	3.12E+00
4.00	9.13E+01	8.28E+01	3.96E+01	1.32E+01	7.27E+00	5.38E+00	2.41E+00
5.00	8.11E+01	7.27E+01	3.07E+01	8.12E+00	4.10E+00	3.10E+00	1.66E+00
6.00	7.13E+01	6.37E+01	2.44E+01	5.18E+00	2.74E+00	2.11E+00	1.14E+00
7.00	6.28E+01	5.59E+01	1.96E+01	3.55E+00	2.09E+00	1.60E+00	7.41E−01
8.00	5.59E+01	4.93E+01	1.56E+01	2.62E+00	1.67E+00	1.25E+00	4.74E−01
9.00	5.05E+01	4.37E+01	1.24E+01	2.06E+00	1.33E+00	9.60E−01	3.11E−01
10.00	4.63E+01	3.89E+01	9.83E+00	1.69E+00	1.04E+00	7.22E−01	2.15E−01
12.50	3.85E+01	3.00E+01	5.59E+00	1.08E+00	5.20E−01	3.47E−01	1.13E−01
15.00	3.19E+01	2.37E+01	3.53E+00	6.74E−01	2.71E−01	1.84E−01	7.73E−02
17.50	2.56E+01	1.88E+01	2.54E+00	4.12E−01	1.62E−01	1.13E−01	5.67E−02
20.00	1.98E+01	1.48E+01	2.00E+00	2.60E−01	1.12E−01	8.07E−02	4.11E−02
22.50	1.52E+01	1.16E+01	1.63E+00	1.74E−01	8.60E−02	6.29E−02	2.89E−02
25.00	1.16E+01	9.09E+00	1.32E+00	1.24E−01	6.94E−02	5.07E−02	1.99E−02
27.50	9.01E+00	7.12E+00	1.06E+00	9.43E−02	5.68E−02	4.09E−02	1.36E−02
30.00	7.15E+00	5.64E+00	8.28E−01	7.54E−02	4.63E−02	3.26E−02	9.19E−03
35.00	4.85E+00	3.71E+00	4.99E−01	5.26E−02	2.99E−02	1.97E−02	4.22E−03
40.00	3.63E+00	2.65E+00	3.04E−01	3.81E−02	1.87E−02	1.14E−02	1.98E−03
45.00	2.92E+00	2.04E+00	1.95E−01	2.75E−02	1.15E−02	6.58E−03	9.70E−04
50.00	2.43E+00	1.63E+00	1.33E−01	1.95E−02	7.03E−03	3.81E−03	4.97E−04
55.00	2.04E+00	1.34E+00	9.77E−02	1.37E−02	4.36E−03	2.25E−03	2.69E−04
60.00	1.70E+00	1.10E+00	7.59E−02	9.59E−03	2.75E−03	1.37E−03	1.55E−04
65.00	1.40E+00	9.09E−01	6.16E−02	6.76E−03	1.79E−03	8.63E−04	9.59E−05
70.00	1.14E+00	7.50E−01	5.18E−02	4.84E−03	1.20E−03	5.68E−04	6.37E−05
75.00	9.33E−01	6.23E−01	4.46E−02	3.54E−03	8.39E−04	3.92E−04	4.54E−05
80.00	7.71E−01	5.23E−01	3.92E−02	2.67E−03	6.11E−04	2.84E−04	3.46E−05
85.00	6.46E−01	4.46E−01	3.52E−02	2.08E−03	4.64E−04	2.16E−04	2.81E−05
90.00	5.53E−01	3.88E−01	3.22E−02	1.67E−03	3.68E−04	1.73E−04	2.40E−05
95.00	4.84E−01	3.45E−01	3.00E−02	1.39E−03	3.04E−04	1.43E−04	2.13E−05
105.00	3.98E−01	2.91E−01	2.72E−02	1.04E−03	2.28E−04	1.09E−04	1.86E−05
120.00	3.45E−01	2.59E−01	2.56E−02	7.89E−04	1.75E−04	8.65E−05	1.73E−05
135.00	3.34E−01	2.53E−01	2.54E−02	6.73E−04	1.52E−04	7.67E−05	1.74E−05
150.00	3.38E−01	2.58E−01	2.56E−02	6.14E−04	1.40E−04	7.22E−05	1.79E−05
165.00	3.45E−01	2.63E−01	2.57E−02	5.84E−04	1.35E−04	7.02E−05	1.84E−05
180.00	3.48E−01	2.65E−01	2.58E−02	5.76E−04	1.33E−04	6.96E−05	1.85E−05
total	3.34E+01	2.58E+01	5.08E+00	1.14E+00	6.83E−01	5.29E−01	2.67E−01
rel ff	3.30E+01	2.46E+01	5.07E+00	1.16E+00	6.96E−01	5.42E−01	2.74E−01
nrl ff	3.35E+01	2.49E+01	5.18E+00	1.19E+00	7.16E−01	5.57E−01	2.82E−01

TABLE 1. Predicted *S*-matrix differential elastic scattering cross sections for photon energies (50.0, 59.54, 145.4, 316.5, 411.8, 468.1, 661.6, 778.9, 964.0, 1004.8, 1112.1, 1274.5, 1408.0 and 1500.0). The angle integrated total cross sections for each element and energies are presented. ''total'' represents total cross sections from this work, ''rel ff'' represents total cross sections calculated from the relativistic form factor and ''nrl ff'' represents total cross sections calculated from the nonrelativistic form factor—Continued[a]

θ (deg)	Photon energy (keV)						
	778.9	964.0	1004.8	1112.1	1274.5	1408.0	1500.0
Yttrium ($Z=39$)							
0.00	1.20*E*+02	1.20*E*+02	1.20*E*+02	1.20*E*+02	1.20*E*+02	1.20*E*+02	1.20*E*+02
0.01	1.20*E*+02	1.20*E*+02	1.20*E*+02	1.20*E*+02	1.19*E*+02	1.19*E*+02	1.19*E*+02
0.02	1.19*E*+02	1.19*E*+02	1.19*E*+02	1.19*E*+02	1.19*E*+02	1.18*E*+02	1.18*E*+02
0.04	1.18*E*+02	1.18*E*+02	1.18*E*+02	1.17*E*+02	1.16*E*+02	1.15*E*+02	1.15*E*+02
0.06	1.17*E*+02	1.15*E*+02	1.15*E*+02	1.14*E*+02	1.12*E*+02	1.11*E*+02	1.10*E*+02
0.10	1.12*E*+02	1.09*E*+02	1.08*E*+02	1.06*E*+02	1.03*E*+02	1.00*E*+02	9.86*E*+01
0.20	9.73*E*+01	9.00*E*+01	8.84*E*+01	8.43*E*+01	7.86*E*+01	7.43*E*+01	7.15*E*+01
0.30	8.25*E*+01	7.29*E*+01	7.10*E*+01	6.61*E*+01	5.93*E*+01	5.44*E*+01	5.14*E*+01
0.40	6.95*E*+01	5.89*E*+01	5.69*E*+01	5.18*E*+01	4.53*E*+01	4.09*E*+01	3.83*E*+01
0.50	5.85*E*+01	4.80*E*+01	4.60*E*+01	4.13*E*+01	3.56*E*+01	3.19*E*+01	2.99*E*+01
0.60	4.96*E*+01	3.97*E*+01	3.79*E*+01	3.37*E*+01	2.87*E*+01	2.56*E*+01	2.40*E*+01
0.70	4.24*E*+01	3.34*E*+01	3.17*E*+01	2.80*E*+01	2.35*E*+01	2.07*E*+01	1.92*E*+01
0.80	3.67*E*+01	2.85*E*+01	2.70*E*+01	2.36*E*+01	1.95*E*+01	1.67*E*+01	1.50*E*+01
1.00	2.82*E*+01	2.13*E*+01	2.00*E*+01	1.70*E*+01	1.32*E*+01	1.04*E*+01	8.71*E*+00
1.20	2.22*E*+01	1.59*E*+01	1.48*E*+01	1.22*E*+01	8.82*E*+00	6.56*E*+00	5.22*E*+00
1.50	1.55*E*+01	1.00*E*+01	9.15*E*+00	7.16*E*+00	4.98*E*+00	3.72*E*+00	3.05*E*+00
1.70	1.21*E*+01	7.37*E*+00	6.64*E*+00	5.11*E*+00	3.62*E*+00	2.89*E*+00	2.57*E*+00
2.00	8.36*E*+00	4.79*E*+00	4.29*E*+00	3.31*E*+00	2.51*E*+00	2.28*E*+00	2.32*E*+00
2.50	4.78*E*+00	2.79*E*+00	2.53*E*+00	2.04*E*+00	1.68*E*+00	1.63*E*+00	1.73*E*+00
3.00	3.11*E*+00	2.03*E*+00	1.88*E*+00	1.57*E*+00	1.22*E*+00	9.75*E*−01	8.14*E*−01
3.50	2.28*E*+00	1.62*E*+00	1.52*E*+00	1.26*E*+00	8.63*E*−01	5.33*E*−01	3.35*E*−01
4.00	1.80*E*+00	1.27*E*+00	1.18*E*+00	9.41*E*−01	5.80*E*−01	3.12*E*−01	1.73*E*−01
5.00	1.16*E*+00	6.73*E*−01	5.97*E*−01	4.33*E*−01	2.55*E*−01	1.55*E*−01	1.05*E*−01
6.00	7.13*E*−01	3.44*E*−01	2.96*E*−01	2.06*E*−01	1.34*E*−01	1.11*E*−01	1.08*E*−01
7.00	4.32*E*−01	1.95*E*−01	1.67*E*−01	1.19*E*−01	8.85*E*−02	9.04*E*−02	1.09*E*−01
8.00	2.72*E*−01	1.29*E*−01	1.12*E*−01	8.40*E*−02	6.72*E*−02	7.11*E*−02	8.55*E*−02
9.00	1.84*E*−01	9.72*E*−02	8.71*E*−02	6.86*E*−02	5.47*E*−02	5.09*E*−02	5.14*E*−02
10.00	1.34*E*−01	8.04*E*−02	7.37*E*−02	6.02*E*−02	4.51*E*−02	3.42*E*−02	2.68*E*−02
12.50	7.85*E*−02	5.46*E*−02	5.09*E*−02	4.13*E*−02	2.53*E*−02	1.27*E*−02	6.37*E*−03
15.00	5.38*E*−02	3.39*E*−02	3.06*E*−02	2.26*E*−02	1.20*E*−02	5.57*E*−03	2.75*E*−03
17.50	3.72*E*−02	1.94*E*−02	1.67*E*−02	1.10*E*−02	5.39*E*−03	2.65*E*−03	1.49*E*−03
20.00	2.48*E*−02	1.08*E*−02	8.94*E*−03	5.40*E*−03	2.46*E*−03	1.27*E*−03	8.00*E*−04
22.50	1.61*E*−02	6.03*E*−03	4.84*E*−03	2.72*E*−03	1.17*E*−03	6.09*E*−04	4.04*E*−04
25.00	1.02*E*−02	3.41*E*−03	2.68*E*−03	1.42*E*−03	5.76*E*−04	2.96*E*−04	1.98*E*−04
27.50	6.48*E*−03	1.97*E*−03	1.51*E*−03	7.72*E*−04	2.97*E*−04	1.48*E*−04	9.77*E*−05
30.00	4.11*E*−03	1.15*E*−03	8.77*E*−04	4.33*E*−04	1.60*E*−04	7.76*E*−05	5.02*E*−05
35.00	1.70*E*−03	4.23*E*−04	3.15*E*−04	1.48*E*−04	5.17*E*−05	2.38*E*−05	1.47*E*−05
40.00	7.37*E*−04	1.70*E*−04	1.26*E*−04	5.84*E*−05	2.03*E*−05	9.43*E*−06	5.89*E*−06
45.00	3.41*E*−04	7.67*E*−05	5.68*E*−05	2.71*E*−05	1.02*E*−05	5.24*E*−06	3.57*E*−06
50.00	1.69*E*−04	3.83*E*−05	2.87*E*−05	1.44*E*−05	6.11*E*−06	3.61*E*−06	2.77*E*−06
55.00	9.05*E*−05	2.16*E*−05	1.66*E*−05	8.93*E*−06	4.46*E*−06	3.15*E*−06	2.78*E*−06
60.00	5.30*E*−05	1.38*E*−05	1.09*E*−05	6.42*E*−06	3.80*E*−06	3.15*E*−06	3.15*E*−06
65.00	3.39*E*−05	9.86*E*−06	8.00*E*−06	5.14*E*−06	3.46*E*−06	3.17*E*−06	3.35*E*−06
70.00	2.37*E*−05	7.82*E*−06	6.55*E*−06	4.55*E*−06	3.41*E*−06	3.28*E*−06	3.49*E*−06
75.00	1.80*E*−05	6.75*E*−06	5.82*E*−06	4.35*E*−06	3.51*E*−06	3.44*E*−06	3.57*E*−06
80.00	1.46*E*−05	6.15*E*−06	5.43*E*−06	4.30*E*−06	3.66*E*−06	3.55*E*−06	3.54*E*−06
85.00	1.26*E*−05	5.90*E*−06	5.32*E*−06	4.42*E*−06	3.90*E*−06	3.69*E*−06	3.50*E*−06
90.00	1.14*E*−05	5.85*E*−06	5.38*E*−06	4.65*E*−06	4.19*E*−06	3.88*E*−06	3.50*E*−06
95.00	1.07*E*−05	5.92*E*−06	5.52*E*−06	4.91*E*−06	4.51*E*−06	4.07*E*−06	3.52*E*−06
105.00	1.01*E*−05	6.32*E*−06	6.02*E*−06	5.61*E*−06	5.25*E*−06	4.54*E*−06	3.68*E*−06
120.00	1.03*E*−05	7.25*E*−06	7.05*E*−06	6.83*E*−06	6.48*E*−06	5.37*E*−06	4.09*E*−06
135.00	1.10*E*−05	8.44*E*−06	8.32*E*−06	8.25*E*−06	7.82*E*−06	6.23*E*−06	4.50*E*−06
150.00	1.18*E*−05	9.49*E*−06	9.43*E*−06	9.48*E*−06	8.99*E*−06	7.03*E*−06	4.95*E*−06
165.00	1.24*E*−05	1.02*E*−05	1.02*E*−05	1.04*E*−05	9.84*E*−06	7.62*E*−06	5.31*E*−06
180.00	1.26*E*−05	1.05*E*−05	1.05*E*−05	1.07*E*−05	1.01*E*−05	7.86*E*−06	5.46*E*−06
total	1.93*E*−01	1.26*E*−01	1.17*E*−01	9.55*E*−02	7.22*E*−02	5.87*E*−02	5.24*E*−02
rel ff	1.98*E*−01	1.30*E*−01	1.20*E*−01	9.76*E*−02	7.42*E*−02	6.10*E*−02	5.39*E*−02
nrl ff	2.04*E*−01	1.34*E*−01	1.23*E*−01	1.01*E*−01	7.65*E*−02	6.29*E*−02	5.55*E*−02

TABLE 1. Predicted *S*-matrix differential elastic scattering cross sections for photon energies (50.0, 59.54, 145.4, 316.5, 411.8, 468.1, 661.6, 778.9, 964.0, 1004.8, 1112.1, 1274.5, 1408.0 and 1500.0). The angle integrated total cross sections for each element and energies are presented. ''total'' represents total cross sections from this work, ''rel ff'' represents total cross sections calculated from the relativistic form factor and ''nrl ff'' represents total cross sections calculated from the nonrelativistic form factor—Continued[a]

θ (deg)	Photon energy (keV)						
	50.0	59.5	145.4	316.5	411.8	468.1	661.6
Zirconium ($Z=40$)							
0.00	1.28E+02	1.28E+02	1.27E+02	1.26E+02	1.26E+02	1.26E+02	1.26E+02
0.01	1.28E+02	1.28E+02	1.26E+02	1.26E+02	1.26E+02	1.26E+02	1.26E+02
0.02	1.28E+02	1.28E+02	1.26E+02	1.26E+02	1.26E+02	1.26E+02	1.26E+02
0.04	1.28E+02	1.28E+02	1.26E+02	1.26E+02	1.26E+02	1.26E+02	1.25E+02
0.06	1.28E+02	1.28E+02	1.26E+02	1.26E+02	1.25E+02	1.25E+02	1.24E+02
0.10	1.28E+02	1.28E+02	1.26E+02	1.25E+02	1.24E+02	1.23E+02	1.20E+02
0.20	1.28E+02	1.28E+02	1.25E+02	1.21E+02	1.17E+02	1.15E+02	1.07E+02
0.30	1.28E+02	1.27E+02	1.24E+02	1.15E+02	1.09E+02	1.06E+02	9.36E+01
0.40	1.27E+02	1.27E+02	1.22E+02	1.09E+02	1.01E+02	9.60E+01	8.11E+01
0.50	1.27E+02	1.26E+02	1.20E+02	1.02E+02	9.22E+01	8.68E+01	7.01E+01
0.60	1.27E+02	1.26E+02	1.17E+02	9.55E+01	8.43E+01	7.83E+01	6.07E+01
0.70	1.26E+02	1.25E+02	1.14E+02	8.93E+01	7.71E+01	7.07E+01	5.27E+01
0.80	1.26E+02	1.25E+02	1.11E+02	8.33E+01	7.04E+01	6.38E+01	4.62E+01
1.00	1.25E+02	1.23E+02	1.05E+02	7.25E+01	5.88E+01	5.23E+01	3.62E+01
1.20	1.23E+02	1.21E+02	9.89E+01	6.31E+01	4.95E+01	4.35E+01	2.93E+01
1.50	1.21E+02	1.18E+02	9.01E+01	5.16E+01	3.91E+01	3.39E+01	2.18E+01
1.70	1.19E+02	1.15E+02	8.45E+01	4.55E+01	3.40E+01	2.91E+01	1.79E+01
2.00	1.16E+02	1.12E+02	7.68E+01	3.82E+01	2.80E+01	2.35E+01	1.31E+01
2.50	1.11E+02	1.05E+02	6.54E+01	2.93E+01	2.06E+01	1.65E+01	7.77E+00
3.00	1.06E+02	9.91E+01	5.59E+01	2.30E+01	1.51E+01	1.15E+01	4.83E+00
3.50	1.01E+02	9.30E+01	4.81E+01	1.81E+01	1.09E+01	8.10E+00	3.34E+00
4.00	9.61E+01	8.72E+01	4.18E+01	1.42E+01	7.86E+00	5.80E+00	2.56E+00
5.00	8.55E+01	7.65E+01	3.25E+01	8.76E+00	4.41E+00	3.32E+00	1.77E+00
6.00	7.51E+01	6.71E+01	2.60E+01	5.58E+00	2.92E+00	2.24E+00	1.22E+00
7.00	6.61E+01	5.89E+01	2.09E+01	3.81E+00	2.22E+00	1.70E+00	8.05E−01
8.00	5.88E+01	5.20E+01	1.68E+01	2.80E+00	1.78E+00	1.33E+00	5.18E−01
9.00	5.31E+01	4.61E+01	1.34E+01	2.20E+00	1.42E+00	1.03E+00	3.40E−01
10.00	4.87E+01	4.11E+01	1.06E+01	1.80E+00	1.12E+00	7.81E−01	2.34E−01
12.50	4.06E+01	3.18E+01	6.04E+00	1.16E+00	5.69E−01	3.79E−01	1.21E−01
15.00	3.39E+01	2.52E+01	3.79E+00	7.29E−01	2.96E−01	1.99E−01	8.16E−02
17.50	2.74E+01	2.01E+01	2.71E+00	4.49E−01	1.75E−01	1.22E−01	6.00E−02
20.00	2.14E+01	1.59E+01	2.12E+00	2.83E−01	1.20E−01	8.58E−02	4.38E−02
22.50	1.64E+01	1.25E+01	1.73E+00	1.88E−01	9.11E−02	6.65E−02	3.12E−02
25.00	1.26E+01	9.82E+00	1.41E+00	1.34E−01	7.32E−02	5.36E−02	2.18E−02
27.50	9.76E+00	7.70E+00	1.13E+00	1.01E−01	6.00E−02	4.34E−02	1.50E−02
30.00	7.72E+00	6.09E+00	8.97E−01	8.03E−02	4.91E−02	3.48E−02	1.03E−02
35.00	5.19E+00	4.00E+00	5.46E−01	5.57E−02	3.22E−02	2.14E−02	4.79E−03
40.00	3.86E+00	2.84E+00	3.33E−01	4.05E−02	2.04E−02	1.26E−02	2.28E−03
45.00	3.09E+00	2.17E+00	2.13E−01	2.94E−02	1.27E−02	7.38E−03	1.12E−03
50.00	2.57E+00	1.74E+00	1.45E−01	2.11E−02	7.87E−03	4.32E−03	5.79E−04
55.00	2.16E+00	1.42E+00	1.05E−01	1.50E−02	4.92E−03	2.57E−03	3.15E−04
60.00	1.81E+00	1.17E+00	8.12E−02	1.06E−02	3.14E−03	1.58E−03	1.82E−04
65.00	1.50E+00	9.72E−01	6.57E−02	7.53E−03	2.05E−03	1.00E−03	1.12E−04
70.00	1.23E+00	8.07E−01	5.50E−02	5.44E−03	1.39E−03	6.61E−04	7.44E−05
75.00	1.02E+00	6.73E−01	4.73E−02	4.01E−03	9.72E−04	4.58E−04	5.29E−05
80.00	8.43E−01	5.68E−01	4.17E−02	3.04E−03	7.10E−04	3.33E−04	4.02E−05
85.00	7.10E−01	4.86E−01	3.74E−02	2.38E−03	5.42E−04	2.54E−04	3.26E−05
90.00	6.09E−01	4.24E−01	3.43E−02	1.92E−03	4.31E−04	2.03E−04	2.77E−05
95.00	5.34E−01	3.78E−01	3.20E−02	1.60E−03	3.56E−04	1.68E−04	2.46E−05
105.00	4.40E−01	3.20E−01	2.93E−02	1.21E−03	2.67E−04	1.29E−04	2.13E−05
120.00	3.81E−01	2.84E−01	2.78E−02	9.22E−04	2.06E−04	1.02E−04	1.97E−05
135.00	3.68E−01	2.78E−01	2.78E−02	7.89E−04	1.78E−04	8.98E−05	1.97E−05
150.00	3.71E−01	2.82E−01	2.81E−02	7.20E−04	1.64E−04	8.43E−05	2.01E−05
165.00	3.78E−01	2.87E−01	2.84E−02	6.86E−04	1.58E−04	8.18E−05	2.06E−05
180.00	3.80E−01	2.90E−01	2.85E−02	6.76E−04	1.56E−04	8.10E−05	2.08E−05
total	3.57E+01	2.75E+01	5.43E+00	1.22E+00	7.30E−01	5.66E−01	2.86E−01
rel ff	3.51E+01	2.62E+01	5.40E+00	1.23E+00	7.44E−01	5.79E−01	2.93E−01
nrl ff	3.57E+01	2.66E+01	5.54E+00	1.27E+00	7.66E−01	5.97E−01	3.02E−01

TABLE 1. Predicted *S*-matrix differential elastic scattering cross sections for photon energies (50.0, 59.54, 145.4, 316.5, 411.8, 468.1, 661.6, 778.9, 964.0, 1004.8, 1112.1, 1274.5, 1408.0 and 1500.0). The angle integrated total cross sections for each element and energies are presented. ''total'' represents total cross sections from this work, ''rel ff'' represents total cross sections calculated from the relativistic form factor and ''nrl ff'' represents total cross sections calculated from the nonrelativistic form factor—Continued[a]

θ (deg)	Photon energy (keV)						
	778.9	964.0	1004.8	1112.1	1274.5	1408.0	1500.0
Zirconium ($Z=40$)							
0.00	1.26E+02	1.26E+02	1.26E+02	1.26E+02	1.26E+02	1.26E+02	1.26E+02
0.01	1.26E+02	1.26E+02	1.26E+02	1.26E+02	1.26E+02	1.26E+02	1.26E+02
0.02	1.26E+02	1.25E+02	1.25E+02	1.25E+02	1.25E+02	1.24E+02	1.24E+02
0.04	1.25E+02	1.24E+02	1.24E+02	1.23E+02	1.22E+02	1.21E+02	1.21E+02
0.06	1.23E+02	1.21E+02	1.21E+02	1.20E+02	1.18E+02	1.17E+02	1.16E+02
0.10	1.18E+02	1.15E+02	1.14E+02	1.12E+02	1.08E+02	1.05E+02	1.04E+02
0.20	1.02E+02	9.46E+01	9.30E+01	8.87E+01	8.27E+01	7.81E+01	7.53E+01
0.30	8.68E+01	7.68E+01	7.47E+01	6.96E+01	6.25E+01	5.73E+01	5.41E+01
0.40	7.31E+01	6.21E+01	5.99E+01	5.46E+01	4.78E+01	4.32E+01	4.05E+01
0.50	6.17E+01	5.06E+01	4.85E+01	4.36E+01	3.76E+01	3.38E+01	3.17E+01
0.60	5.23E+01	4.19E+01	4.00E+01	3.56E+01	3.04E+01	2.72E+01	2.55E+01
0.70	4.48E+01	3.53E+01	3.36E+01	2.97E+01	2.50E+01	2.21E+01	2.05E+01
0.80	3.88E+01	3.02E+01	2.87E+01	2.51E+01	2.08E+01	1.79E+01	1.61E+01
1.00	2.99E+01	2.27E+01	2.14E+01	1.83E+01	1.42E+01	1.13E+01	9.42E+00
1.20	2.36E+01	1.71E+01	1.59E+01	1.31E+01	9.53E+00	7.08E+00	5.62E+00
1.50	1.66E+01	1.09E+01	9.89E+00	7.75E+00	5.37E+00	3.98E+00	3.23E+00
1.70	1.30E+01	7.97E+00	7.18E+00	5.52E+00	3.89E+00	3.07E+00	2.71E+00
2.00	9.02E+00	5.16E+00	4.62E+00	3.56E+00	2.67E+00	2.41E+00	2.44E+00
2.50	5.15E+00	2.98E+00	2.70E+00	2.16E+00	1.78E+00	1.74E+00	1.87E+00
3.00	3.33E+00	2.15E+00	1.99E+00	1.66E+00	1.30E+00	1.06E+00	9.10E−01
3.50	2.43E+00	1.72E+00	1.61E+00	1.34E+00	9.30E−01	5.87E−01	3.78E−01
4.00	1.91E+00	1.35E+00	1.26E+00	1.01E+00	6.32E−01	3.43E−01	1.92E−01
5.00	1.24E+00	7.34E−01	6.54E−01	4.77E−01	2.79E−01	1.66E−01	1.09E−01
6.00	7.73E−01	3.78E−01	3.25E−01	2.26E−01	1.45E−01	1.16E−01	1.09E−01
7.00	4.71E−01	2.12E−01	1.82E−01	1.28E−01	9.42E−02	9.47E−02	1.13E−01
8.00	2.96E−01	1.38E−01	1.20E−01	8.90E−02	7.08E−02	7.54E−02	9.21E−02
9.00	1.99E−01	1.03E−01	9.18E−02	7.17E−02	5.74E−02	5.49E−02	5.74E−02
10.00	1.44E−01	8.45E−02	7.72E−02	6.27E−02	4.76E−02	3.74E−02	3.07E−02
12.50	8.32E−02	5.77E−02	5.38E−02	4.39E−02	2.74E−02	1.41E−02	7.26E−03
15.00	5.69E−02	3.65E−02	3.31E−02	2.48E−02	1.34E−02	6.25E−03	3.06E−03
17.50	3.97E−02	2.13E−02	1.85E−02	1.24E−02	6.15E−03	3.00E−03	1.66E−03
20.00	2.69E−02	1.21E−02	1.01E−02	6.16E−03	2.84E−03	1.46E−03	9.01E−04
22.50	1.77E−02	6.83E−03	5.51E−03	3.14E−03	1.36E−03	7.06E−04	4.62E−04
25.00	1.14E−02	3.90E−03	3.08E−03	1.65E−03	6.76E−04	3.46E−04	2.30E−04
27.50	7.30E−03	2.26E−03	1.75E−03	9.01E−04	3.49E−04	1.74E−04	1.15E−04
30.00	4.67E−03	1.34E−03	1.02E−03	5.07E−04	1.88E−04	9.15E−05	5.91E−05
35.00	1.96E−03	4.94E−04	3.68E−04	1.74E−04	6.06E−05	2.78E−05	1.72E−05
40.00	8.57E−04	2.00E−04	1.47E−04	6.83E−05	2.35E−05	1.08E−05	6.71E−06
45.00	3.98E−04	8.96E−05	6.62E−05	3.13E−05	1.16E−05	5.86E−06	3.94E−06
50.00	1.97E−04	4.45E−05	3.32E−05	1.65E−05	6.83E−06	3.95E−06	2.99E−06
55.00	1.06E−04	2.49E−05	1.90E−05	1.01E−05	4.92E−06	3.40E−06	2.97E−06
60.00	6.17E−05	1.58E−05	1.24E−05	7.17E−06	4.14E−06	3.38E−06	3.36E−06
65.00	3.93E−05	1.11E−05	8.99E−06	5.67E−06	3.74E−06	3.40E−06	3.60E−06
70.00	2.74E−05	8.78E−06	7.30E−06	4.99E−06	3.66E−06	3.52E−06	3.77E−06
75.00	2.07E−05	7.53E−06	6.44E−06	4.73E−06	3.76E−06	3.69E−06	3.88E−06
80.00	1.67E−05	6.82E−06	5.98E−06	4.66E−06	3.91E−06	3.81E−06	3.86E−06
85.00	1.44E−05	6.52E−06	5.84E−06	4.78E−06	4.16E−06	3.97E−06	3.82E−06
90.00	1.30E−05	6.44E−06	5.88E−06	5.01E−06	4.47E−06	4.17E−06	3.83E−06
95.00	1.21E−05	6.50E−06	6.02E−06	5.28E−06	4.80E−06	4.37E−06	3.85E−06
105.00	1.14E−05	6.90E−06	6.54E−06	6.01E−06	5.58E−06	4.88E−06	4.02E−06
120.00	1.15E−05	7.87E−06	7.62E−06	7.30E−06	6.88E−06	5.75E−06	4.44E−06
135.00	1.23E−05	9.12E−06	8.95E−06	8.79E−06	8.29E−06	6.65E−06	4.86E−06
150.00	1.31E−05	1.02E−05	1.01E−05	1.01E−05	9.52E−06	7.49E−06	5.33E−06
165.00	1.37E−05	1.10E−05	1.09E−05	1.10E−05	1.04E−05	8.11E−06	5.70E−06
180.00	1.39E−05	1.13E−05	1.12E−05	1.13E−05	1.07E−05	8.35E−06	5.86E−06
total	2.06E−01	1.35E−01	1.25E−01	1.02E−01	7.72E−02	6.28E−02	5.61E−02
rel ff	2.12E−01	1.39E−01	1.28E−01	1.04E−01	7.94E−02	6.52E−02	5.76E−02
nrl ff	2.19E−01	1.43E−01	1.32E−01	1.08E−01	8.19E−02	6.74E−02	5.95E−02

TABLE 1. Predicted *S*-matrix differential elastic scattering cross sections for photon energies (50.0, 59.54, 145.4, 316.5, 411.8, 468.1, 661.6, 778.9, 964.0, 1004.8, 1112.1, 1274.5, 1408.0 and 1500.0). The angle integrated total cross sections for each element and energies are presented. ''total'' represents total cross sections from this work, ''rel ff'' represents total cross sections calculated from the relativistic form factor and ''nrl ff'' represents total cross sections calculated from the nonrelativistic form factor—Continued[a]

θ (deg)	Photon energy (keV)						
	50.0	59.5	145.4	316.5	411.8	468.1	661.6
Niobium ($Z=41$)							
0.00	1.35E+02	1.34E+02	1.33E+02	1.32E+02	1.32E+02	1.32E+02	1.32E+02
0.01	1.35E+02	1.34E+02	1.33E+02	1.32E+02	1.32E+02	1.32E+02	1.32E+02
0.02	1.35E+02	1.34E+02	1.33E+02	1.32E+02	1.32E+02	1.32E+02	1.32E+02
0.04	1.34E+02	1.34E+02	1.33E+02	1.32E+02	1.32E+02	1.32E+02	1.31E+02
0.06	1.34E+02	1.34E+02	1.33E+02	1.32E+02	1.31E+02	1.31E+02	1.30E+02
0.10	1.34E+02	1.34E+02	1.33E+02	1.31E+02	1.30E+02	1.29E+02	1.26E+02
0.20	1.34E+02	1.34E+02	1.31E+02	1.27E+02	1.23E+02	1.21E+02	1.13E+02
0.30	1.34E+02	1.34E+02	1.30E+02	1.21E+02	1.15E+02	1.11E+02	9.84E+01
0.40	1.34E+02	1.33E+02	1.28E+02	1.14E+02	1.06E+02	1.01E+02	8.54E+01
0.50	1.33E+02	1.33E+02	1.26E+02	1.07E+02	9.70E+01	9.13E+01	7.38E+01
0.60	1.33E+02	1.32E+02	1.23E+02	1.00E+02	8.87E+01	8.24E+01	6.39E+01
0.70	1.33E+02	1.32E+02	1.20E+02	9.39E+01	8.11E+01	7.44E+01	5.56E+01
0.80	1.32E+02	1.31E+02	1.17E+02	8.76E+01	7.41E+01	6.72E+01	4.87E+01
1.00	1.31E+02	1.29E+02	1.10E+02	7.63E+01	6.20E+01	5.52E+01	3.82E+01
1.20	1.30E+02	1.27E+02	1.04E+02	6.64E+01	5.22E+01	4.59E+01	3.09E+01
1.50	1.27E+02	1.24E+02	9.48E+01	5.44E+01	4.13E+01	3.58E+01	2.31E+01
1.70	1.25E+02	1.21E+02	8.89E+01	4.80E+01	3.59E+01	3.08E+01	1.91E+01
2.00	1.22E+02	1.17E+02	8.09E+01	4.03E+01	2.96E+01	2.49E+01	1.41E+01
2.50	1.17E+02	1.11E+02	6.89E+01	3.10E+01	2.19E+01	1.76E+01	8.39E+00
3.00	1.12E+02	1.04E+02	5.89E+01	2.44E+01	1.61E+01	1.24E+01	5.21E+00
3.50	1.07E+02	9.79E+01	5.08E+01	1.93E+01	1.17E+01	8.73E+00	3.58E+00
4.00	1.01E+02	9.17E+01	4.42E+01	1.52E+01	8.48E+00	6.26E+00	2.73E+00
5.00	9.00E+01	8.06E+01	3.44E+01	9.44E+00	4.75E+00	3.56E+00	1.87E+00
6.00	7.91E+01	7.06E+01	2.75E+01	6.02E+00	3.12E+00	2.39E+00	1.31E+00
7.00	6.96E+01	6.21E+01	2.23E+01	4.10E+00	2.35E+00	1.80E+00	8.70E−01
8.00	6.18E+01	5.48E+01	1.79E+01	3.00E+00	1.88E+00	1.41E+00	5.65E−01
9.00	5.58E+01	4.86E+01	1.44E+01	2.34E+00	1.51E+00	1.10E+00	3.71E−01
10.00	5.11E+01	4.34E+01	1.14E+01	1.91E+00	1.19E+00	8.41E−01	2.55E−01
12.50	4.27E+01	3.36E+01	6.52E+00	1.24E+00	6.19E−01	4.13E−01	1.29E−01
15.00	3.58E+01	2.67E+01	4.08E+00	7.86E−01	3.23E−01	2.17E−01	8.61E−02
17.50	2.92E+01	2.14E+01	2.89E+00	4.88E−01	1.89E−01	1.31E−01	6.32E−02
20.00	2.30E+01	1.70E+01	2.25E+00	3.08E−01	1.28E−01	9.13E−02	4.66E−02
22.50	1.78E+01	1.35E+01	1.83E+00	2.05E−01	9.65E−02	7.03E−02	3.36E−02
25.00	1.36E+01	1.06E+01	1.50E+00	1.44E−01	7.72E−02	5.65E−02	2.37E−02
27.50	1.06E+01	8.31E+00	1.21E+00	1.08E−01	6.33E−02	4.59E−02	1.65E−02
30.00	8.34E+00	6.58E+00	9.66E−01	8.55E−02	5.20E−02	3.70E−02	1.14E−02
35.00	5.57E+00	4.31E+00	5.94E−01	5.89E−02	3.44E−02	2.32E−02	5.40E−03
40.00	4.11E+00	3.05E+00	3.65E−01	4.29E−02	2.21E−02	1.39E−02	2.60E−03
45.00	3.27E+00	2.31E+00	2.32E−01	3.14E−02	1.39E−02	8.22E−03	1.29E−03
50.00	2.71E+00	1.84E+00	1.57E−01	2.27E−02	8.75E−03	4.87E−03	6.71E−04
55.00	2.28E+00	1.51E+00	1.14E−01	1.63E−02	5.53E−03	2.93E−03	3.66E−04
60.00	1.92E+00	1.25E+00	8.71E−02	1.16E−02	3.55E−03	1.81E−03	2.12E−04
65.00	1.60E+00	1.04E+00	7.00E−02	8.34E−03	2.34E−03	1.15E−03	1.31E−04
70.00	1.32E+00	8.63E−01	5.84E−02	6.07E−03	1.59E−03	7.65E−04	8.66E−05
75.00	1.10E+00	7.23E−01	5.01E−02	4.51E−03	1.12E−03	5.32E−04	6.16E−05
80.00	9.16E−01	6.13E−01	4.41E−02	3.44E−03	8.22E−04	3.88E−04	4.67E−05
85.00	7.75E−01	5.27E−01	3.97E−02	2.71E−03	6.29E−04	2.96E−04	3.77E−05
90.00	6.68E−01	4.61E−01	3.65E−02	2.20E−03	5.02E−04	2.37E−04	3.21E−05
95.00	5.87E−01	4.12E−01	3.41E−02	1.84E−03	4.15E−04	1.97E−04	2.84E−05
105.00	4.86E−01	3.50E−01	3.14E−02	1.39E−03	3.13E−04	1.51E−04	2.45E−05
120.00	4.20E−01	3.11E−01	3.00E−02	1.07E−03	2.41E−04	1.19E−04	2.25E−05
135.00	4.04E−01	3.04E−01	3.02E−02	9.21E−04	2.09E−04	1.05E−04	2.23E−05
150.00	4.07E−01	3.08E−01	3.07E−02	8.42E−04	1.93E−04	9.82E−05	2.27E−05
165.00	4.14E−01	3.14E−01	3.11E−02	8.03E−04	1.85E−04	9.52E−05	2.31E−05
180.00	4.16E−01	3.16E−01	3.12E−02	7.91E−04	1.82E−04	9.43E−05	2.33E−05
total	3.81E+01	2.94E+01	5.80E+00	1.30E+00	7.80E−01	6.04E−01	3.05E−01
rel ff	3.74E+01	2.79E+01	5.76E+00	1.32E+00	7.93E−01	6.18E−01	3.13E−01
nrl ff	3.81E+01	2.84E+01	5.91E+00	1.36E+00	8.20E−01	6.38E−01	3.23E−01

TABLE 1. Predicted *S*-matrix differential elastic scattering cross sections for photon energies (50.0, 59.54, 145.4, 316.5, 411.8, 468.1, 661.6, 778.9, 964.0, 1004.8, 1112.1, 1274.5, 1408.0 and 1500.0). The angle integrated total cross sections for each element and energies are presented. ''total'' represents total cross sections from this work, ''rel ff'' represents total cross sections calculated from the relativistic form factor and ''nrl ff'' represents total cross sections calculated from the nonrelativistic form factor—Continued[a]

θ (deg)	Photon energy (keV)						
	778.9	964.0	1004.8	1112.1	1274.5	1408.0	1500.0
Niobium ($Z=41$)							
0.00	1.32E+02	1.32E+02	1.32E+02	1.32E+02	1.32E+02	1.32E+02	1.32E+02
0.01	1.32E+02	1.32E+02	1.32E+02	1.32E+02	1.32E+02	1.32E+02	1.32E+02
0.02	1.32E+02	1.32E+02	1.32E+02	1.32E+02	1.31E+02	1.31E+02	1.30E+02
0.04	1.31E+02	1.30E+02	1.30E+02	1.29E+02	1.29E+02	1.28E+02	1.27E+02
0.06	1.29E+02	1.27E+02	1.27E+02	1.26E+02	1.24E+02	1.23E+02	1.22E+02
0.10	1.24E+02	1.20E+02	1.19E+02	1.17E+02	1.14E+02	1.11E+02	1.09E+02
0.20	1.08E+02	9.95E+01	9.78E+01	9.33E+01	8.70E+01	8.22E+01	7.92E+01
0.30	9.13E+01	8.08E+01	7.86E+01	7.32E+01	6.58E+01	6.04E+01	5.70E+01
0.40	7.70E+01	6.54E+01	6.31E+01	5.76E+01	5.04E+01	4.55E+01	4.27E+01
0.50	6.49E+01	5.33E+01	5.12E+01	4.60E+01	3.97E+01	3.57E+01	3.35E+01
0.60	5.51E+01	4.42E+01	4.22E+01	3.76E+01	3.22E+01	2.88E+01	2.70E+01
0.70	4.72E+01	3.72E+01	3.55E+01	3.14E+01	2.65E+01	2.35E+01	2.18E+01
0.80	4.09E+01	3.19E+01	3.03E+01	2.66E+01	2.21E+01	1.91E+01	1.73E+01
1.00	3.16E+01	2.41E+01	2.27E+01	1.94E+01	1.52E+01	1.21E+01	1.02E+01
1.20	2.50E+01	1.82E+01	1.70E+01	1.41E+01	1.03E+01	7.64E+00	6.07E+00
1.50	1.77E+01	1.17E+01	1.07E+01	8.38E+00	5.80E+00	4.27E+00	3.44E+00
1.70	1.40E+01	8.61E+00	7.76E+00	5.98E+00	4.18E+00	3.27E+00	2.85E+00
2.00	9.72E+00	5.58E+00	4.99E+00	3.83E+00	2.86E+00	2.54E+00	2.55E+00
2.50	5.55E+00	3.19E+00	2.88E+00	2.30E+00	1.88E+00	1.85E+00	2.00E+00
3.00	3.57E+00	2.28E+00	2.10E+00	1.75E+00	1.38E+00	1.15E+00	1.01E+00
3.50	2.59E+00	1.81E+00	1.70E+00	1.42E+00	9.96E−01	6.47E−01	4.29E−01
4.00	2.02E+00	1.44E+00	1.34E+00	1.08E+00	6.84E−01	3.78E−01	2.14E−01
5.00	1.32E+00	7.97E−01	7.13E−01	5.24E−01	3.06E−01	1.77E−01	1.13E−01
6.00	8.34E−01	4.14E−01	3.58E−01	2.49E−01	1.58E−01	1.21E−01	1.09E−01
7.00	5.12E−01	2.32E−01	1.98E−01	1.39E−01	1.00E−01	9.88E−02	1.15E−01
8.00	3.23E−01	1.49E−01	1.29E−01	9.46E−02	7.46E−02	7.95E−02	9.77E−02
9.00	2.16E−01	1.09E−01	9.71E−02	7.51E−02	6.02E−02	5.89E−02	6.34E−02
10.00	1.55E−01	8.89E−02	8.09E−02	6.52E−02	5.00E−02	4.07E−02	3.48E−02
12.50	8.81E−02	6.06E−02	5.66E−02	4.64E−02	2.95E−02	1.57E−02	8.32E−03
15.00	6.01E−02	3.91E−02	3.56E−02	2.70E−02	1.48E−02	6.97E−03	3.42E−03
17.50	4.23E−02	2.33E−02	2.03E−02	1.39E−02	6.96E−03	3.37E−03	1.84E−03
20.00	2.90E−02	1.34E−02	1.13E−02	7.00E−03	3.26E−03	1.66E−03	1.01E−03
22.50	1.93E−02	7.68E−03	6.24E−03	3.60E−03	1.57E−03	8.13E−04	5.25E−04
25.00	1.26E−02	4.43E−03	3.51E−03	1.91E−03	7.88E−04	4.03E−04	2.65E−04
27.50	8.17E−03	2.59E−03	2.01E−03	1.05E−03	4.09E−04	2.04E−04	1.34E−04
30.00	5.28E−03	1.54E−03	1.18E−03	5.90E−04	2.21E−04	1.07E−04	6.92E−05
35.00	2.24E−03	5.74E−04	4.29E−04	2.03E−04	7.08E−05	3.25E−05	2.01E−05
40.00	9.91E−04	2.33E−04	1.72E−04	7.95E−05	2.72E−05	1.24E−05	7.65E−06
45.00	4.63E−04	1.04E−04	7.70E−05	3.62E−05	1.32E−05	6.56E−06	4.36E−06
50.00	2.30E−04	5.16E−05	3.84E−05	1.88E−05	7.65E−06	4.34E−06	3.23E−06
55.00	1.23E−04	2.87E−05	2.17E−05	1.14E−05	5.43E−06	3.67E−06	3.17E−06
60.00	7.17E−05	1.80E−05	1.40E−05	8.01E−06	4.52E−06	3.63E−06	3.58E−06
65.00	4.56E−05	1.26E−05	1.01E−05	6.28E−06	4.06E−06	3.64E−06	3.85E−06
70.00	3.16E−05	9.86E−06	8.14E−06	5.47E−06	3.94E−06	3.77E−06	4.07E−06
75.00	2.38E−05	8.40E−06	7.14E−06	5.16E−06	4.04E−06	3.96E−06	4.21E−06
80.00	1.92E−05	7.58E−06	6.61E−06	5.06E−06	4.19E−06	4.09E−06	4.19E−06
85.00	1.64E−05	7.21E−06	6.42E−06	5.17E−06	4.44E−06	4.26E−06	4.16E−06
90.00	1.48E−05	7.11E−06	6.45E−06	5.41E−06	4.77E−06	4.48E−06	4.18E−06
95.00	1.37E−05	7.15E−06	6.58E−06	5.69E−06	5.12E−06	4.69E−06	4.20E−06
105.00	1.29E−05	7.56E−06	7.12E−06	6.45E−06	5.94E−06	5.23E−06	4.38E−06
120.00	1.29E−05	8.56E−06	8.24E−06	7.80E−06	7.30E−06	6.16E−06	4.83E−06
135.00	1.36E−05	9.86E−06	9.63E−06	9.37E−06	8.78E−06	7.10E−06	5.26E−06
150.00	1.44E−05	1.10E−05	1.08E−05	1.07E−05	1.01E−05	7.97E−06	5.74E−06
165.00	1.51E−05	1.18E−05	1.17E−05	1.17E−05	1.10E−05	8.62E−06	6.13E−06
180.00	1.53E−05	1.21E−05	1.20E−05	1.20E−05	1.13E−05	8.88E−06	6.29E−06
total	2.20E−01	1.44E−01	1.33E−01	1.09E−01	8.25E−02	6.71E−02	5.98E−02
rel ff	2.27E−01	1.48E−01	1.37E−01	1.11E−01	8.48E−02	6.97E−02	6.16E−02
nrl ff	2.34E−01	1.53E−01	1.41E−01	1.15E−01	8.77E−02	7.21E−02	6.37E−02

TABLE 1. Predicted *S*-matrix differential elastic scattering cross sections for photon energies (50.0, 59.54, 145.4, 316.5, 411.8, 468.1, 661.6, 778.9, 964.0, 1004.8, 1112.1, 1274.5, 1408.0 and 1500.0). The angle integrated total cross sections for each element and energies are presented. ''total'' represents total cross sections from this work, ''rel ff'' represents total cross sections calculated from the relativistic form factor and ''nrl ff'' represents total cross sections calculated from the nonrelativistic form factor—Continued[a]

θ (deg)	Photon energy (keV)						
	50.0	59.5	145.4	316.5	411.8	468.1	661.6
Molybdemun ($Z=42$)							
0.00	1.41E+02	1.41E+02	1.39E+02	1.39E+02	1.39E+02	1.39E+02	1.39E+02
0.01	1.41E+02	1.41E+02	1.39E+02	1.39E+02	1.39E+02	1.39E+02	1.39E+02
0.02	1.41E+02	1.41E+02	1.39E+02	1.39E+02	1.39E+02	1.39E+02	1.39E+02
0.04	1.41E+02	1.41E+02	1.39E+02	1.39E+02	1.39E+02	1.38E+02	1.38E+02
0.06	1.41E+02	1.41E+02	1.39E+02	1.38E+02	1.38E+02	1.37E+02	1.36E+02
0.10	1.41E+02	1.41E+02	1.39E+02	1.37E+02	1.36E+02	1.35E+02	1.32E+02
0.20	1.41E+02	1.41E+02	1.38E+02	1.33E+02	1.29E+02	1.27E+02	1.18E+02
0.30	1.41E+02	1.40E+02	1.36E+02	1.27E+02	1.20E+02	1.17E+02	1.03E+02
0.40	1.40E+02	1.40E+02	1.34E+02	1.20E+02	1.11E+02	1.06E+02	8.98E+01
0.50	1.40E+02	1.39E+02	1.32E+02	1.13E+02	1.02E+02	9.60E+01	7.77E+01
0.60	1.40E+02	1.39E+02	1.29E+02	1.05E+02	9.32E+01	8.66E+01	6.73E+01
0.70	1.39E+02	1.38E+02	1.26E+02	9.87E+01	8.53E+01	7.83E+01	5.85E+01
0.80	1.39E+02	1.37E+02	1.22E+02	9.21E+01	7.80E+01	7.07E+01	5.13E+01
1.00	1.38E+02	1.36E+02	1.16E+02	8.02E+01	6.52E+01	5.81E+01	4.03E+01
1.20	1.36E+02	1.33E+02	1.09E+02	6.99E+01	5.50E+01	4.83E+01	3.26E+01
1.50	1.33E+02	1.30E+02	9.96E+01	5.73E+01	4.35E+01	3.77E+01	2.45E+01
1.70	1.31E+02	1.27E+02	9.35E+01	5.06E+01	3.78E+01	3.25E+01	2.02E+01
2.00	1.28E+02	1.23E+02	8.51E+01	4.25E+01	3.12E+01	2.63E+01	1.51E+01
2.50	1.23E+02	1.16E+02	7.26E+01	3.27E+01	2.32E+01	1.87E+01	9.04E+00
3.00	1.17E+02	1.09E+02	6.21E+01	2.58E+01	1.72E+01	1.33E+01	5.63E+00
3.50	1.12E+02	1.03E+02	5.35E+01	2.05E+01	1.26E+01	9.39E+00	3.85E+00
4.00	1.06E+02	9.65E+01	4.65E+01	1.62E+01	9.14E+00	6.75E+00	2.91E+00
5.00	9.48E+01	8.48E+01	3.62E+01	1.01E+01	5.12E+00	3.83E+00	1.97E+00
6.00	8.34E+01	7.44E+01	2.91E+01	6.50E+00	3.34E+00	2.55E+00	1.39E+00
7.00	7.34E+01	6.54E+01	2.36E+01	4.41E+00	2.49E+00	1.91E+00	9.36E−01
8.00	6.51E+01	5.77E+01	1.91E+01	3.21E+00	1.98E+00	1.50E+00	6.14E−01
9.00	5.87E+01	5.13E+01	1.54E+01	2.50E+00	1.60E+00	1.17E+00	4.05E−01
10.00	5.36E+01	4.58E+01	1.23E+01	2.03E+00	1.27E+00	9.00E−01	2.77E−01
12.50	4.47E+01	3.55E+01	7.05E+00	1.31E+00	6.71E−01	4.49E−01	1.38E−01
15.00	3.76E+01	2.82E+01	4.40E+00	8.43E−01	3.53E−01	2.36E−01	9.08E−02
17.50	3.09E+01	2.27E+01	3.09E+00	5.28E−01	2.05E−01	1.41E−01	6.65E−02
20.00	2.45E+01	1.81E+01	2.39E+00	3.35E−01	1.37E−01	9.73E−02	4.93E−02
22.50	1.91E+01	1.44E+01	1.94E+00	2.22E−01	1.02E−01	7.42E−02	3.59E−02
25.00	1.47E+01	1.14E+01	1.59E+00	1.56E−01	8.14E−02	5.95E−02	2.56E−02
27.50	1.14E+01	8.96E+00	1.29E+00	1.16E−01	6.66E−02	4.84E−02	1.80E−02
30.00	9.03E+00	7.11E+00	1.03E+00	9.12E−02	5.48E−02	3.92E−02	1.26E−02
35.00	6.00E+00	4.65E+00	6.45E−01	6.23E−02	3.67E−02	2.49E−02	6.06E−03
40.00	4.39E+00	3.27E+00	3.98E−01	4.53E−02	2.39E−02	1.52E−02	2.96E−03
45.00	3.46E+00	2.47E+00	2.54E−01	3.33E−02	1.53E−02	9.11E−03	1.48E−03
50.00	2.86E+00	1.96E+00	1.71E−01	2.43E−02	9.68E−03	5.45E−03	7.74E−04
55.00	2.40E+00	1.60E+00	1.23E−01	1.76E−02	6.18E−03	3.31E−03	4.24E−04
60.00	2.02E+00	1.32E+00	9.34E−02	1.27E−02	4.00E−03	2.06E−03	2.46E−04
65.00	1.69E+00	1.10E+00	7.46E−02	9.18E−03	2.65E−03	1.32E−03	1.52E−04
70.00	1.41E+00	9.19E−01	6.20E−02	6.74E−03	1.81E−03	8.82E−04	1.01E−04
75.00	1.18E+00	7.73E−01	5.31E−02	5.04E−03	1.28E−03	6.15E−04	7.15E−05
80.00	9.89E−01	6.58E−01	4.67E−02	3.87E−03	9.47E−04	4.50E−04	5.42E−05
85.00	8.42E−01	5.68E−01	4.21E−02	3.06E−03	7.28E−04	3.45E−04	4.37E−05
90.00	7.28E−01	4.99E−01	3.87E−02	2.50E−03	5.82E−04	2.76E−04	3.71E−05
95.00	6.43E−01	4.47E−01	3.63E−02	2.10E−03	4.83E−04	2.30E−04	3.28E−05
105.00	5.34E−01	3.81E−01	3.35E−02	1.60E−03	3.65E−04	1.76E−04	2.82E−05
120.00	4.63E−01	3.40E−01	3.23E−02	1.24E−03	2.82E−04	1.39E−04	2.57E−05
135.00	4.45E−01	3.32E−01	3.27E−02	1.07E−03	2.44E−04	1.22E−04	2.53E−05
150.00	4.47E−01	3.37E−01	3.33E−02	9.80E−04	2.25E−04	1.14E−04	2.56E−05
165.00	4.53E−01	3.43E−01	3.39E−02	9.35E−04	2.16E−04	1.11E−04	2.60E−05
180.00	4.56E−01	3.45E−01	3.40E−02	9.22E−04	2.13E−04	1.10E−04	2.62E−05
total	4.06E+01	3.13E+01	6.18E+00	1.38E+00	8.31E−01	6.44E−01	3.25E−01
rel ff	3.97E+01	2.96E+01	6.12E+00	1.40E+00	8.45E−01	6.58E−01	3.33E−01
nrl ff	4.05E+01	3.02E+01	6.30E+00	1.45E+00	8.75E−01	6.82E−01	3.44E−01

TABLE 1. Predicted *S*-matrix differential elastic scattering cross sections for photon energies (50.0, 59.54, 145.4, 316.5, 411.8, 468.1, 661.6, 778.9, 964.0, 1004.8, 1112.1, 1274.5, 1408.0 and 1500.0). The angle integrated total cross sections for each element and energies are presented. ''total'' represents total cross sections from this work, ''rel ff'' represents total cross sections calculated from the relativistic form factor and ''nrl ff'' represents total cross sections calculated from the nonrelativistic form factor—Continued[a]

θ (deg)	Photon energy (keV)						
	778.9	964.0	1004.8	1112.1	1274.5	1408.0	1500.0
Molybdemun ($Z=42$)							
0.00	1.39E+02	1.39E+02	1.39E+02	1.39E+02	1.39E+02	1.39E+02	1.39E+02
0.01	1.39E+02	1.39E+02	1.39E+02	1.38E+02	1.38E+02	1.38E+02	1.38E+02
0.02	1.38E+02	1.38E+02	1.38E+02	1.38E+02	1.38E+02	1.37E+02	1.37E+02
0.04	1.37E+02	1.36E+02	1.36E+02	1.36E+02	1.35E+02	1.34E+02	1.33E+02
0.06	1.35E+02	1.34E+02	1.33E+02	1.32E+02	1.30E+02	1.29E+02	1.28E+02
0.10	1.30E+02	1.26E+02	1.25E+02	1.23E+02	1.19E+02	1.16E+02	1.14E+02
0.20	1.13E+02	1.05E+02	1.03E+02	9.81E+01	9.14E+01	8.65E+01	8.33E+01
0.30	9.59E+01	8.50E+01	8.27E+01	7.70E+01	6.93E+01	6.36E+01	6.01E+01
0.40	8.10E+01	6.88E+01	6.64E+01	6.06E+01	5.31E+01	4.80E+01	4.50E+01
0.50	6.84E+01	5.62E+01	5.39E+01	4.85E+01	4.18E+01	3.76E+01	3.53E+01
0.60	5.80E+01	4.66E+01	4.45E+01	3.96E+01	3.39E+01	3.04E+01	2.85E+01
0.70	4.97E+01	3.92E+01	3.74E+01	3.31E+01	2.80E+01	2.48E+01	2.31E+01
0.80	4.31E+01	3.36E+01	3.19E+01	2.81E+01	2.34E+01	2.02E+01	1.84E+01
1.00	3.34E+01	2.54E+01	2.40E+01	2.06E+01	1.62E+01	1.30E+01	1.10E+01
1.20	2.65E+01	1.94E+01	1.81E+01	1.50E+01	1.10E+01	8.25E+00	6.57E+00
1.50	1.88E+01	1.25E+01	1.15E+01	9.04E+00	6.27E+00	4.59E+00	3.68E+00
1.70	1.49E+01	9.28E+00	8.39E+00	6.47E+00	4.52E+00	3.49E+00	3.00E+00
2.00	1.05E+01	6.03E+00	5.40E+00	4.14E+00	3.06E+00	2.68E+00	2.64E+00
2.50	5.99E+00	3.42E+00	3.08E+00	2.45E+00	1.99E+00	1.95E+00	2.10E+00
3.00	3.83E+00	2.41E+00	2.22E+00	1.83E+00	1.46E+00	1.24E+00	1.12E+00
3.50	2.76E+00	1.91E+00	1.78E+00	1.48E+00	1.06E+00	7.11E−01	4.89E−01
4.00	2.14E+00	1.52E+00	1.41E+00	1.15E+00	7.37E−01	4.17E−01	2.42E−01
5.00	1.40E+00	8.61E−01	7.73E−01	5.72E−01	3.34E−01	1.91E−01	1.19E−01
6.00	8.96E−01	4.54E−01	3.93E−01	2.75E−01	1.71E−01	1.27E−01	1.09E−01
7.00	5.56E−01	2.53E−01	2.17E−01	1.52E−01	1.07E−01	1.03E−01	1.16E−01
8.00	3.51E−01	1.60E−01	1.39E−01	1.01E−01	7.86E−02	8.32E−02	1.02E−01
9.00	2.34E−01	1.16E−01	1.03E−01	7.88E−02	6.30E−02	6.27E−02	6.93E−02
10.00	1.67E−01	9.35E−02	8.47E−02	6.77E−02	5.24E−02	4.41E−02	3.94E−02
12.50	9.33E−02	6.35E−02	5.92E−02	4.86E−02	3.15E−02	1.74E−02	9.56E−03
15.00	6.33E−02	4.16E−02	3.81E−02	2.92E−02	1.63E−02	7.75E−03	3.81E−03
17.50	4.48E−02	2.53E−02	2.22E−02	1.54E−02	7.83E−03	3.78E−03	2.02E−03
20.00	3.11E−02	1.48E−02	1.25E−02	7.91E−03	3.73E−03	1.88E−03	1.12E−03
22.50	2.10E−02	8.60E−03	7.03E−03	4.11E−03	1.82E−03	9.31E−04	5.92E−04
25.00	1.39E−02	5.01E−03	3.99E−03	2.20E−03	9.14E−04	4.66E−04	3.04E−04
27.50	9.08E−03	2.96E−03	2.31E−03	1.21E−03	4.76E−04	2.38E−04	1.55E−04
30.00	5.93E−03	1.77E−03	1.36E−03	6.85E−04	2.58E−04	1.25E−04	8.07E−05
35.00	2.55E−03	6.65E−04	4.97E−04	2.37E−04	8.26E−05	3.78E−05	2.34E−05
40.00	1.14E−03	2.71E−04	2.00E−04	9.24E−05	3.15E−05	1.43E−05	8.74E−06
45.00	5.35E−04	1.21E−04	8.93E−05	4.18E−05	1.50E−05	7.35E−06	4.84E−06
50.00	2.67E−04	5.97E−05	4.43E−05	2.15E−05	8.57E−06	4.77E−06	3.50E−06
55.00	1.43E−04	3.29E−05	2.49E−05	1.29E−05	6.00E−06	3.98E−06	3.39E−06
60.00	8.32E−05	2.05E−05	1.59E−05	8.97E−06	4.94E−06	3.91E−06	3.83E−06
65.00	5.26E−05	1.43E−05	1.14E−05	6.96E−06	4.40E−06	3.91E−06	4.13E−06
70.00	3.64E−05	1.11E−05	9.10E−06	6.02E−06	4.26E−06	4.05E−06	4.38E−06
75.00	2.73E−05	9.40E−06	7.94E−06	5.64E−06	4.34E−06	4.25E−06	4.55E−06
80.00	2.20E−05	8.44E−06	7.31E−06	5.51E−06	4.49E−06	4.39E−06	4.55E−06
85.00	1.88E−05	8.00E−06	7.08E−06	5.61E−06	4.75E−06	4.57E−06	4.52E−06
90.00	1.68E−05	7.86E−06	7.08E−06	5.85E−06	5.10E−06	4.81E−06	4.55E−06
95.00	1.56E−05	7.88E−06	7.21E−06	6.14E−06	5.46E−06	5.04E−06	4.58E−06
105.00	1.45E−05	8.28E−06	7.75E−06	6.94E−06	6.32E−06	5.61E−06	4.77E−06
120.00	1.44E−05	9.31E−06	8.91E−06	8.34E−06	7.75E−06	6.59E−06	5.24E−06
135.00	1.52E−05	1.07E−05	1.04E−05	9.98E−06	9.30E−06	7.58E−06	5.69E−06
150.00	1.60E−05	1.19E−05	1.16E−05	1.14E−05	1.06E−05	8.49E−06	6.19E−06
165.00	1.67E−05	1.27E−05	1.25E−05	1.24E−05	1.16E−05	9.17E−06	6.59E−06
180.00	1.69E−05	1.30E−05	1.29E−05	1.27E−05	1.20E−05	9.44E−06	6.76E−06
total	2.35E−01	1.54E−01	1.42E−01	1.16E−01	8.79E−02	7.15E−02	6.37E−02
rel ff	2.41E−01	1.58E−01	1.46E−01	1.19E−01	9.04E−02	7.43E−02	6.56E−02
nrl ff	2.47E−01	1.63E−01	1.51E−01	1.24E−01	9.42E−02	7.73E−02	6.81E−02

TABLE 1. Predicted *S*-matrix differential elastic scattering cross sections for photon energies (50.0, 59.54, 145.4, 316.5, 411.8, 468.1, 661.6, 778.9, 964.0, 1004.8, 1112.1, 1274.5, 1408.0 and 1500.0). The angle integrated total cross sections for each element and energies are presented. ''total'' represents total cross sections from this work, ''rel ff'' represents total cross sections calculated from the relativistic form factor and ''nrl ff'' represents total cross sections calculated from the nonrelativistic form factor—Continued[a]

θ (deg)	Photon energy (keV)						
	50.0	59.5	145.4	316.5	411.8	468.1	661.6
Technetium ($Z=43$)							
0.00	1.48E+02	1.48E+02	1.46E+02	1.46E+02	1.46E+02	1.46E+02	1.45E+02
0.01	1.48E+02	1.48E+02	1.46E+02	1.46E+02	1.45E+02	1.45E+02	1.45E+02
0.02	1.48E+02	1.48E+02	1.46E+02	1.45E+02	1.45E+02	1.45E+02	1.45E+02
0.04	1.48E+02	1.48E+02	1.46E+02	1.45E+02	1.45E+02	1.45E+02	1.44E+02
0.06	1.48E+02	1.48E+02	1.46E+02	1.45E+02	1.44E+02	1.44E+02	1.43E+02
0.10	1.48E+02	1.48E+02	1.46E+02	1.44E+02	1.43E+02	1.42E+02	1.39E+02
0.20	1.48E+02	1.47E+02	1.45E+02	1.40E+02	1.36E+02	1.33E+02	1.24E+02
0.30	1.48E+02	1.47E+02	1.43E+02	1.33E+02	1.27E+02	1.23E+02	1.09E+02
0.40	1.47E+02	1.47E+02	1.41E+02	1.26E+02	1.17E+02	1.12E+02	9.48E+01
0.50	1.47E+02	1.46E+02	1.38E+02	1.18E+02	1.07E+02	1.01E+02	8.21E+01
0.60	1.47E+02	1.46E+02	1.35E+02	1.11E+02	9.84E+01	9.15E+01	7.12E+01
0.70	1.46E+02	1.45E+02	1.32E+02	1.04E+02	9.01E+01	8.28E+01	6.19E+01
0.80	1.46E+02	1.44E+02	1.29E+02	9.72E+01	8.24E+01	7.48E+01	5.41E+01
1.00	1.45E+02	1.42E+02	1.22E+02	8.48E+01	6.90E+01	6.14E+01	4.23E+01
1.20	1.43E+02	1.40E+02	1.15E+02	7.40E+01	5.81E+01	5.10E+01	3.40E+01
1.50	1.40E+02	1.36E+02	1.05E+02	6.06E+01	4.58E+01	3.95E+01	2.54E+01
1.70	1.38E+02	1.34E+02	9.87E+01	5.34E+01	3.96E+01	3.39E+01	2.11E+01
2.00	1.35E+02	1.30E+02	8.99E+01	4.46E+01	3.25E+01	2.74E+01	1.60E+01
2.50	1.29E+02	1.22E+02	7.68E+01	3.41E+01	2.42E+01	1.97E+01	9.89E+00
3.00	1.23E+02	1.15E+02	6.57E+01	2.69E+01	1.81E+01	1.41E+01	6.22E+00
3.50	1.18E+02	1.09E+02	5.65E+01	2.14E+01	1.35E+01	1.02E+01	4.20E+00
4.00	1.12E+02	1.02E+02	4.90E+01	1.71E+01	1.00E+01	7.40E+00	3.10E+00
5.00	1.01E+02	8.97E+01	3.79E+01	1.10E+01	5.66E+00	4.20E+00	2.04E+00
6.00	8.89E+01	7.88E+01	3.02E+01	7.12E+00	3.61E+00	2.73E+00	1.44E+00
7.00	7.84E+01	6.93E+01	2.45E+01	4.83E+00	2.62E+00	1.99E+00	1.00E+00
8.00	6.94E+01	6.11E+01	2.00E+01	3.49E+00	2.05E+00	1.55E+00	6.70E−01
9.00	6.21E+01	5.42E+01	1.63E+01	2.67E+00	1.65E+00	1.22E+00	4.47E−01
10.00	5.62E+01	4.82E+01	1.32E+01	2.14E+00	1.33E+00	9.51E−01	3.07E−01
12.50	4.60E+01	3.71E+01	7.78E+00	1.37E+00	7.31E−01	4.92E−01	1.48E−01
15.00	3.86E+01	2.94E+01	4.84E+00	8.94E−01	3.90E−01	2.60E−01	9.46E−02
17.50	3.20E+01	2.36E+01	3.33E+00	5.73E−01	2.25E−01	1.54E−01	6.89E−02
20.00	2.59E+01	1.91E+01	2.51E+00	3.68E−01	1.48E−01	1.04E−01	5.15E−02
22.50	2.05E+01	1.53E+01	2.01E+00	2.44E−01	1.08E−01	7.75E−02	3.80E−02
25.00	1.61E+01	1.23E+01	1.64E+00	1.70E−01	8.46E−02	6.16E−02	2.75E−02
27.50	1.27E+01	9.80E+00	1.35E+00	1.25E−01	6.89E−02	5.01E−02	1.96E−02
30.00	1.00E+01	7.84E+00	1.09E+00	9.72E−02	5.69E−02	4.09E−02	1.38E−02
35.00	6.64E+00	5.15E+00	6.99E−01	6.51E−02	3.87E−02	2.65E−02	6.78E−03
40.00	4.77E+00	3.58E+00	4.39E−01	4.71E−02	2.56E−02	1.65E−02	3.35E−03
45.00	3.68E+00	2.65E+00	2.81E−01	3.48E−02	1.66E−02	1.01E−02	1.70E−03
50.00	2.98E+00	2.06E+00	1.89E−01	2.57E−02	1.07E−02	6.10E−03	8.91E−04
55.00	2.48E+00	1.66E+00	1.34E−01	1.88E−02	6.87E−03	3.74E−03	4.90E−04
60.00	2.08E+00	1.37E+00	1.00E−01	1.37E−02	4.49E−03	2.34E−03	2.85E−04
65.00	1.75E+00	1.14E+00	7.93E−02	1.00E−02	3.00E−03	1.51E−03	1.77E−04
70.00	1.48E+00	9.62E−01	6.52E−02	7.44E−03	2.06E−03	1.01E−03	1.17E−04
75.00	1.25E+00	8.16E−01	5.56E−02	5.62E−03	1.47E−03	7.11E−04	8.32E−05
80.00	1.06E+00	7.01E−01	4.87E−02	4.35E−03	1.09E−03	5.22E−04	6.31E−05
85.00	9.13E−01	6.11E−01	4.39E−02	3.46E−03	8.41E−04	4.01E−04	5.09E−05
90.00	7.98E−01	5.41E−01	4.04E−02	2.84E−03	6.75E−04	3.22E−04	4.32E−05
95.00	7.10E−01	4.88E−01	3.80E−02	2.40E−03	5.62E−04	2.69E−04	3.81E−05
105.00	5.96E−01	4.20E−01	3.53E−02	1.85E−03	4.27E−04	2.07E−04	3.26E−05
120.00	5.20E−01	3.78E−01	3.44E−02	1.44E−03	3.31E−04	1.63E−04	2.95E−05
135.00	5.00E−01	3.69E−01	3.50E−02	1.25E−03	2.87E−04	1.44E−04	2.89E−05
150.00	5.02E−01	3.74E−01	3.59E−02	1.14E−03	2.65E−04	1.34E−04	2.91E−05
165.00	5.08E−01	3.80E−01	3.66E−02	1.09E−03	2.54E−04	1.30E−04	2.95E−05
180.00	5.10E−01	3.82E−01	3.68E−02	1.08E−03	2.50E−04	1.28E−04	2.96E−05
total	4.33E+01	3.33E+01	6.57E+00	1.47E+00	8.84E−01	6.85E−01	3.46E−01
rel ff	4.21E+01	3.14E+01	6.50E+00	1.49E+00	8.99E−01	7.00E−01	3.54E−01
nrl ff	4.30E+01	3.21E+01	6.69E+00	1.54E+00	9.32E−01	7.26E−01	3.68E−01

TABLE 1. Predicted *S*-matrix differential elastic scattering cross sections for photon energies (50.0, 59.54, 145.4, 316.5, 411.8, 468.1, 661.6, 778.9, 964.0, 1004.8, 1112.1, 1274.5, 1408.0 and 1500.0). The angle integrated total cross sections for each element and energies are presented. ''total'' represents total cross sections from this work, ''rel ff'' represents total cross sections calculated from the relativistic form factor and ''nrl ff'' represents total cross sections calculated from the nonrelativistic form factor—Continued[a]

θ (deg)	Photon energy (keV)						
	778.9	964.0	1004.8	1112.1	1274.5	1408.0	1500.0
Technetium ($Z=43$)							
0.00	1.45E+02	1.45E+02	1.45E+02	1.45E+02	1.45E+02	1.45E+02	1.45E+02
0.01	1.45E+02	1.45E+02	1.45E+02	1.45E+02	1.45E+02	1.45E+02	1.45E+02
0.02	1.45E+02	1.45E+02	1.45E+02	1.45E+02	1.44E+02	1.44E+02	1.43E+02
0.04	1.44E+02	1.43E+02	1.43E+02	1.42E+02	1.41E+02	1.40E+02	1.40E+02
0.06	1.42E+02	1.40E+02	1.40E+02	1.39E+02	1.37E+02	1.35E+02	1.34E+02
0.10	1.37E+02	1.33E+02	1.32E+02	1.29E+02	1.25E+02	1.22E+02	1.20E+02
0.20	1.19E+02	1.10E+02	1.08E+02	1.03E+02	9.65E+01	9.13E+01	8.80E+01
0.30	1.01E+02	8.97E+01	8.74E+01	8.14E+01	7.33E+01	6.73E+01	6.35E+01
0.40	8.56E+01	7.28E+01	7.03E+01	6.41E+01	5.61E+01	5.05E+01	4.73E+01
0.50	7.23E+01	5.94E+01	5.70E+01	5.11E+01	4.39E+01	3.93E+01	3.66E+01
0.60	6.13E+01	4.91E+01	4.68E+01	4.16E+01	3.53E+01	3.15E+01	2.94E+01
0.70	5.25E+01	4.11E+01	3.91E+01	3.45E+01	2.91E+01	2.58E+01	2.40E+01
0.80	4.53E+01	3.50E+01	3.32E+01	2.91E+01	2.43E+01	2.12E+01	1.95E+01
1.00	3.48E+01	2.64E+01	2.49E+01	2.14E+01	1.71E+01	1.40E+01	1.22E+01
1.20	2.75E+01	2.02E+01	1.89E+01	1.59E+01	1.19E+01	9.12E+00	7.40E+00
1.50	1.98E+01	1.35E+01	1.24E+01	9.90E+00	6.93E+00	5.05E+00	3.99E+00
1.70	1.59E+01	1.02E+01	9.23E+00	7.20E+00	5.00E+00	3.75E+00	3.09E+00
2.00	1.13E+01	6.70E+00	6.01E+00	4.62E+00	3.32E+00	2.76E+00	2.56E+00
2.50	6.59E+00	3.74E+00	3.35E+00	2.63E+00	2.07E+00	1.98E+00	2.10E+00
3.00	4.18E+00	2.53E+00	2.31E+00	1.88E+00	1.50E+00	1.33E+00	1.28E+00
3.50	2.94E+00	1.95E+00	1.80E+00	1.49E+00	1.10E+00	8.05E−01	6.12E−01
4.00	2.24E+00	1.56E+00	1.45E+00	1.18E+00	7.86E−01	4.76E−01	2.97E−01
5.00	1.46E+00	9.28E−01	8.40E−01	6.34E−01	3.72E−01	2.06E−01	1.22E−01
6.00	9.53E−01	5.05E−01	4.42E−01	3.12E−01	1.90E−01	1.30E−01	1.02E−01
7.00	6.05E−01	2.82E−01	2.42E−01	1.69E−01	1.16E−01	1.03E−01	1.08E−01
8.00	3.86E−01	1.75E−01	1.51E−01	1.09E−01	8.23E−02	8.49E−02	1.03E−01
9.00	2.57E−01	1.24E−01	1.09E−01	8.18E−02	6.48E−02	6.61E−02	7.61E−02
10.00	1.82E−01	9.72E−02	8.72E−02	6.86E−02	5.36E−02	4.80E−02	4.64E−02
12.50	9.83E−02	6.51E−02	6.05E−02	4.96E−02	3.31E−02	1.95E−02	1.15E−02
15.00	6.58E−02	4.39E−02	4.03E−02	3.14E−02	1.79E−02	8.56E−03	4.20E−03
17.50	4.68E−02	2.74E−02	2.43E−02	1.72E−02	8.84E−03	4.17E−03	2.15E−03
20.00	3.30E−02	1.63E−02	1.39E−02	8.97E−03	4.27E−03	2.10E−03	1.20E−03
22.50	2.26E−02	9.60E−03	7.90E−03	4.70E−03	2.09E−03	1.06E−03	6.57E−04
25.00	1.52E−02	5.65E−03	4.53E−03	2.52E−03	1.06E−03	5.37E−04	3.47E−04
27.50	1.01E−02	3.36E−03	2.63E−03	1.39E−03	5.54E−04	2.77E−04	1.80E−04
30.00	6.64E−03	2.02E−03	1.56E−03	7.91E−04	3.00E−04	1.47E−04	9.46E−05
35.00	2.90E−03	7.67E−04	5.75E−04	2.75E−04	9.62E−05	4.43E−05	2.74E−05
40.00	1.31E−03	3.14E−04	2.32E−04	1.07E−04	3.64E−05	1.64E−05	1.01E−05
45.00	6.19E−04	1.41E−04	1.03E−04	4.82E−05	1.71E−05	8.26E−06	5.37E−06
50.00	3.10E−04	6.91E−05	5.12E−05	2.46E−05	9.61E−06	5.23E−06	3.78E−06
55.00	1.66E−04	3.79E−05	2.86E−05	1.46E−05	6.63E−06	4.30E−06	3.61E−06
60.00	9.65E−05	2.35E−05	1.81E−05	1.01E−05	5.40E−06	4.18E−06	4.03E−06
65.00	6.10E−05	1.62E−05	1.29E−05	7.74E−06	4.77E−06	4.17E−06	4.36E−06
70.00	4.21E−05	1.25E−05	1.02E−05	6.64E−06	4.59E−06	4.31E−06	4.66E−06
75.00	3.15E−05	1.06E−05	8.85E−06	6.19E−06	4.66E−06	4.52E−06	4.85E−06
80.00	2.53E−05	9.45E−06	8.12E−06	6.02E−06	4.80E−06	4.68E−06	4.87E−06
85.00	2.15E−05	8.91E−06	7.83E−06	6.10E−06	5.07E−06	4.88E−06	4.87E−06
90.00	1.93E−05	8.72E−06	7.80E−06	6.33E−06	5.43E−06	5.14E−06	4.93E−06
95.00	1.78E−05	8.71E−06	7.91E−06	6.63E−06	5.81E−06	5.38E−06	4.97E−06
105.00	1.65E−05	9.10E−06	8.45E−06	7.44E−06	6.70E−06	6.00E−06	5.20E−06
120.00	1.63E−05	1.01E−05	9.64E−06	8.88E−06	8.18E−06	7.04E−06	5.72E−06
135.00	1.70E−05	1.15E−05	1.11E−05	1.06E−05	9.80E−06	8.09E−06	6.20E−06
150.00	1.78E−05	1.28E−05	1.24E−05	1.20E−05	1.12E−05	9.04E−06	6.72E−06
165.00	1.85E−05	1.37E−05	1.34E−05	1.31E−05	1.22E−05	9.74E−06	7.14E−06
180.00	1.87E−05	1.40E−05	1.37E−05	1.34E−05	1.26E−05	1.00E−05	7.32E−06
total	2.50E−01	1.64E−01	1.51E−01	1.23E−01	9.34E−02	7.60E−02	6.76E−02
rel ff	2.57E−01	1.68E−01	1.55E−01	1.26E−01	9.61E−02	7.90E−02	6.98E−02
nrl ff	2.67E−01	1.75E−01	1.61E−01	1.31E−01	1.00E−01	8.22E−02	7.26E−02

TABLE 1. Predicted *S*-matrix differential elastic scattering cross sections for photon energies (50.0, 59.54, 145.4, 316.5, 411.8, 468.1, 661.6, 778.9, 964.0, 1004.8, 1112.1, 1274.5, 1408.0 and 1500.0). The angle integrated total cross sections for each element and energies are presented. ''total'' represents total cross sections from this work, ''rel ff'' represents total cross sections calculated from the relativistic form factor and ''nrl ff'' represents total cross sections calculated from the nonrelativistic form factor—Continued[a]

θ (deg)	Photon energy (keV)						
	50.0	59.5	145.4	316.5	411.8	468.1	661.6
Ruthenium ($Z=44$)							
0.00	1.55E+02	1.55E+02	1.53E+02	1.52E+02	1.52E+02	1.52E+02	1.52E+02
0.01	1.55E+02	1.55E+02	1.53E+02	1.52E+02	1.52E+02	1.52E+02	1.52E+02
0.02	1.55E+02	1.55E+02	1.53E+02	1.52E+02	1.52E+02	1.52E+02	1.52E+02
0.04	1.55E+02	1.55E+02	1.53E+02	1.52E+02	1.52E+02	1.52E+02	1.51E+02
0.06	1.55E+02	1.55E+02	1.53E+02	1.52E+02	1.51E+02	1.51E+02	1.50E+02
0.10	1.55E+02	1.55E+02	1.53E+02	1.51E+02	1.50E+02	1.49E+02	1.46E+02
0.20	1.55E+02	1.54E+02	1.52E+02	1.46E+02	1.42E+02	1.40E+02	1.31E+02
0.30	1.55E+02	1.54E+02	1.50E+02	1.40E+02	1.33E+02	1.29E+02	1.15E+02
0.40	1.54E+02	1.54E+02	1.48E+02	1.32E+02	1.23E+02	1.17E+02	9.99E+01
0.50	1.54E+02	1.53E+02	1.45E+02	1.24E+02	1.13E+02	1.07E+02	8.67E+01
0.60	1.54E+02	1.53E+02	1.42E+02	1.17E+02	1.04E+02	9.65E+01	7.51E+01
0.70	1.53E+02	1.52E+02	1.39E+02	1.10E+02	9.50E+01	8.73E+01	6.54E+01
0.80	1.53E+02	1.51E+02	1.35E+02	1.02E+02	8.70E+01	7.90E+01	5.70E+01
1.00	1.52E+02	1.49E+02	1.28E+02	8.95E+01	7.29E+01	6.48E+01	4.43E+01
1.20	1.50E+02	1.47E+02	1.21E+02	7.81E+01	6.13E+01	5.36E+01	3.54E+01
1.50	1.47E+02	1.43E+02	1.11E+02	6.39E+01	4.81E+01	4.14E+01	2.64E+01
1.70	1.45E+02	1.40E+02	1.04E+02	5.62E+01	4.14E+01	3.54E+01	2.21E+01
2.00	1.41E+02	1.36E+02	9.48E+01	4.68E+01	3.38E+01	2.85E+01	1.70E+01
2.50	1.35E+02	1.29E+02	8.11E+01	3.56E+01	2.51E+01	2.06E+01	1.07E+01
3.00	1.30E+02	1.21E+02	6.94E+01	2.80E+01	1.91E+01	1.50E+01	6.83E+00
3.50	1.24E+02	1.14E+02	5.97E+01	2.24E+01	1.45E+01	1.10E+01	4.58E+00
4.00	1.18E+02	1.07E+02	5.16E+01	1.81E+01	1.09E+01	8.08E+00	3.31E+00
5.00	1.06E+02	9.46E+01	3.96E+01	1.18E+01	6.22E+00	4.58E+00	2.11E+00
6.00	9.45E+01	8.32E+01	3.14E+01	7.77E+00	3.90E+00	2.92E+00	1.50E+00
7.00	8.35E+01	7.33E+01	2.55E+01	5.28E+00	2.75E+00	2.09E+00	1.06E+00
8.00	7.37E+01	6.46E+01	2.10E+01	3.77E+00	2.13E+00	1.60E+00	7.28E−01
9.00	6.55E+01	5.71E+01	1.73E+01	2.85E+00	1.71E+00	1.27E+00	4.92E−01
10.00	5.89E+01	5.08E+01	1.42E+01	2.26E+00	1.39E+00	1.00E+00	3.38E−01
12.50	4.74E+01	3.88E+01	8.53E+00	1.43E+00	7.91E−01	5.36E−01	1.59E−01
15.00	3.96E+01	3.06E+01	5.31E+00	9.47E−01	4.30E−01	2.86E−01	9.89E−02
17.50	3.31E+01	2.46E+01	3.59E+00	6.19E−01	2.47E−01	1.67E−01	7.14E−02
20.00	2.73E+01	2.00E+01	2.65E+00	4.02E−01	1.59E−01	1.11E−01	5.38E−02
22.50	2.20E+01	1.63E+01	2.09E+00	2.67E−01	1.14E−01	8.13E−02	4.02E−02
25.00	1.75E+01	1.32E+01	1.71E+00	1.86E−01	8.82E−02	6.39E−02	2.95E−02
27.50	1.39E+01	1.06E+01	1.41E+00	1.35E−01	7.15E−02	5.20E−02	2.12E−02
30.00	1.11E+01	8.58E+00	1.15E+00	1.04E−01	5.92E−02	4.26E−02	1.51E−02
35.00	7.31E+00	5.66E+00	7.55E−01	6.82E−02	4.07E−02	2.81E−02	7.53E−03
40.00	5.17E+00	3.90E+00	4.82E−01	4.90E−02	2.73E−02	1.78E−02	3.77E−03
45.00	3.90E+00	2.84E+00	3.10E−01	3.64E−02	1.80E−02	1.10E−02	1.93E−03
50.00	3.11E+00	2.18E+00	2.07E−01	2.71E−02	1.17E−02	6.77E−03	1.02E−03
55.00	2.56E+00	1.74E+00	1.46E−01	2.00E−02	7.61E−03	4.19E−03	5.64E−04
60.00	2.15E+00	1.42E+00	1.08E−01	1.48E−02	5.01E−03	2.65E−03	3.30E−04
65.00	1.82E+00	1.19E+00	8.44E−02	1.09E−02	3.37E−03	1.72E−03	2.04E−04
70.00	1.55E+00	1.01E+00	6.88E−02	8.18E−03	2.34E−03	1.16E−03	1.36E−04
75.00	1.32E+00	8.60E−01	5.83E−02	6.23E−03	1.68E−03	8.18E−04	9.65E−05
80.00	1.13E+00	7.44E−01	5.10E−02	4.85E−03	1.25E−03	6.03E−04	7.33E−05
85.00	9.84E−01	6.53E−01	4.59E−02	3.89E−03	9.67E−04	4.65E−04	5.90E−05
90.00	8.67E−01	5.83E−01	4.23E−02	3.21E−03	7.79E−04	3.75E−04	5.01E−05
95.00	7.77E−01	5.29E−01	3.98E−02	2.72E−03	6.51E−04	3.14E−04	4.42E−05
105.00	6.59E−01	4.60E−01	3.72E−02	2.11E−03	4.96E−04	2.41E−04	3.77E−05
120.00	5.80E−01	4.16E−01	3.66E−02	1.66E−03	3.87E−04	1.91E−04	3.39E−05
135.00	5.59E−01	4.08E−01	3.75E−02	1.44E−03	3.36E−04	1.68E−04	3.29E−05
150.00	5.59E−01	4.13E−01	3.86E−02	1.33E−03	3.10E−04	1.57E−04	3.30E−05
165.00	5.65E−01	4.19E−01	3.94E−02	1.27E−03	2.97E−04	1.51E−04	3.33E−05
180.00	5.68E−01	4.22E−01	3.97E−02	1.25E−03	2.93E−04	1.50E−04	3.35E−05
total	4.60E+01	3.54E+01	6.98E+00	1.57E+00	9.40E−01	7.28E−01	3.68E−01
rel ff	4.46E+01	3.34E+01	6.89E+00	1.58E+00	9.55E−01	7.44E−01	3.77E−01
nrl ff	4.56E+01	3.41E+01	7.11E+00	1.64E+00	9.93E−01	7.74E−01	3.92E−01

TABLE 1. Predicted *S*-matrix differential elastic scattering cross sections for photon energies (50.0, 59.54, 145.4, 316.5, 411.8, 468.1, 661.6, 778.9, 964.0, 1004.8, 1112.1, 1274.5, 1408.0 and 1500.0). The angle integrated total cross sections for each element and energies are presented. ''total'' represents total cross sections from this work, ''rel ff'' represents total cross sections calculated from the relativistic form factor and ''nrl ff'' represents total cross sections calculated from the nonrelativistic form factor—Continued[a]

θ (deg)	Photon energy (keV)						
	778.9	964.0	1004.8	1112.1	1274.5	1408.0	1500.0
Ruthenium ($Z=44$)							
0.00	1.52E+02	1.52E+02	1.52E+02	1.52E+02	1.52E+02	1.52E+02	1.52E+02
0.01	1.52E+02	1.52E+02	1.52E+02	1.52E+02	1.52E+02	1.52E+02	1.52E+02
0.02	1.52E+02	1.52E+02	1.52E+02	1.51E+02	1.51E+02	1.51E+02	1.50E+02
0.04	1.51E+02	1.50E+02	1.50E+02	1.49E+02	1.48E+02	1.47E+02	1.46E+02
0.06	1.49E+02	1.47E+02	1.47E+02	1.45E+02	1.43E+02	1.42E+02	1.40E+02
0.10	1.43E+02	1.39E+02	1.38E+02	1.36E+02	1.32E+02	1.28E+02	1.26E+02
0.20	1.25E+02	1.16E+02	1.14E+02	1.09E+02	1.02E+02	9.62E+01	9.28E+01
0.30	1.07E+02	9.46E+01	9.21E+01	8.59E+01	7.73E+01	7.10E+01	6.70E+01
0.40	9.03E+01	7.69E+01	7.42E+01	6.77E+01	5.91E+01	5.32E+01	4.96E+01
0.50	7.64E+01	6.27E+01	6.01E+01	5.39E+01	4.61E+01	4.10E+01	3.81E+01
0.60	6.47E+01	5.16E+01	4.92E+01	4.36E+01	3.69E+01	3.27E+01	3.04E+01
0.70	5.53E+01	4.31E+01	4.09E+01	3.60E+01	3.02E+01	2.68E+01	2.50E+01
0.80	4.75E+01	3.65E+01	3.46E+01	3.03E+01	2.52E+01	2.22E+01	2.05E+01
1.00	3.63E+01	2.73E+01	2.58E+01	2.23E+01	1.80E+01	1.51E+01	1.33E+01
1.20	2.86E+01	2.11E+01	1.98E+01	1.67E+01	1.28E+01	1.00E+01	8.27E+00
1.50	2.07E+01	1.44E+01	1.33E+01	1.08E+01	7.62E+00	5.53E+00	4.31E+00
1.70	1.68E+01	1.11E+01	1.01E+01	7.94E+00	5.50E+00	4.02E+00	3.21E+00
2.00	1.22E+01	7.39E+00	6.65E+00	5.11E+00	3.60E+00	2.85E+00	2.52E+00
2.50	7.21E+00	4.07E+00	3.64E+00	2.82E+00	2.17E+00	2.02E+00	2.10E+00
3.00	4.54E+00	2.66E+00	2.41E+00	1.93E+00	1.54E+00	1.43E+00	1.44E+00
3.50	3.14E+00	2.00E+00	1.84E+00	1.51E+00	1.15E+00	9.02E−01	7.47E−01
4.00	2.36E+00	1.60E+00	1.48E+00	1.21E+00	8.35E−01	5.39E−01	3.59E−01
5.00	1.52E+00	9.95E−01	9.07E−01	6.96E−01	4.12E−01	2.23E−01	1.28E−01
6.00	1.01E+00	5.59E−01	4.92E−01	3.52E−01	2.10E−01	1.34E−01	9.64E−02
7.00	6.56E−01	3.13E−01	2.69E−01	1.88E−01	1.24E−01	1.04E−01	1.02E−01
8.00	4.23E−01	1.92E−01	1.65E−01	1.17E−01	8.64E−02	8.68E−02	1.02E−01
9.00	2.82E−01	1.32E−01	1.15E−01	8.52E−02	6.70E−02	6.95E−02	8.23E−02
10.00	1.98E−01	1.01E−01	9.02E−02	6.99E−02	5.51E−02	5.19E−02	5.37E−02
12.50	1.04E−01	6.69E−02	6.19E−02	5.07E−02	3.48E−02	2.17E−02	1.37E−02
15.00	6.84E−02	4.61E−02	4.26E−02	3.35E−02	1.95E−02	9.44E−03	4.65E−03
17.50	4.89E−02	2.95E−02	2.64E−02	1.90E−02	9.89E−03	4.59E−03	2.30E−03
20.00	3.49E−02	1.79E−02	1.54E−02	1.01E−02	4.85E−03	2.33E−03	1.29E−03
22.50	2.43E−02	1.07E−02	8.84E−03	5.34E−03	2.40E−03	1.20E−03	7.26E−04
25.00	1.65E−02	6.33E−03	5.10E−03	2.88E−03	1.22E−03	6.16E−04	3.93E−04
27.50	1.11E−02	3.79E−03	2.99E−03	1.60E−03	6.40E−04	3.20E−04	2.07E−04
30.00	7.39E−03	2.30E−03	1.78E−03	9.10E−04	3.48E−04	1.71E−04	1.10E−04
35.00	3.28E−03	8.81E−04	6.62E−04	3.18E−04	1.12E−04	5.16E−05	3.20E−05
40.00	1.49E−03	3.62E−04	2.68E−04	1.24E−04	4.20E−05	1.89E−05	1.16E−05
45.00	7.11E−04	1.62E−04	1.20E−04	5.54E−05	1.95E−05	9.28E−06	5.98E−06
50.00	3.57E−04	7.98E−05	5.90E−05	2.81E−05	1.08E−05	5.76E−06	4.10E−06
55.00	1.92E−04	4.36E−05	3.27E−05	1.65E−05	7.34E−06	4.66E−06	3.85E−06
60.00	1.12E−04	2.69E−05	2.06E−05	1.13E−05	5.91E−06	4.48E−06	4.27E−06
65.00	7.04E−05	1.84E−05	1.45E−05	8.61E−06	5.19E−06	4.46E−06	4.63E−06
70.00	4.86E−05	1.41E−05	1.15E−05	7.34E−06	4.96E−06	4.60E−06	4.97E−06
75.00	3.63E−05	1.19E−05	9.88E−06	6.79E−06	5.01E−06	4.82E−06	5.19E−06
80.00	2.91E−05	1.06E−05	9.03E−06	6.58E−06	5.15E−06	4.99E−06	5.23E−06
85.00	2.47E−05	9.93E−06	8.66E−06	6.63E−06	5.43E−06	5.21E−06	5.25E−06
90.00	2.21E−05	9.69E−06	8.61E−06	6.87E−06	5.80E−06	5.49E−06	5.34E−06
95.00	2.04E−05	9.63E−06	8.69E−06	7.16E−06	6.18E−06	5.76E−06	5.40E−06
105.00	1.88E−05	1.00E−05	9.23E−06	7.99E−06	7.12E−06	6.42E−06	5.66E−06
120.00	1.83E−05	1.11E−05	1.04E−05	9.48E−06	8.65E−06	7.52E−06	6.23E−06
135.00	1.90E−05	1.25E−05	1.20E−05	1.12E−05	1.03E−05	8.62E−06	6.74E−06
150.00	1.98E−05	1.38E−05	1.33E−05	1.27E−05	1.18E−05	9.62E−06	7.29E−06
165.00	2.04E−05	1.47E−05	1.43E−05	1.38E−05	1.28E−05	1.04E−05	7.73E−06
180.00	2.07E−05	1.50E−05	1.46E−05	1.42E−05	1.32E−05	1.06E−05	7.91E−06
total	2.65E−01	1.74E−01	1.60E−01	1.31E−01	9.93E−02	8.08E−02	7.18E−02
rel ff	2.73E−01	1.79E−01	1.65E−01	1.34E−01	1.02E−01	8.41E−02	7.43E−02
nrl ff	2.84E−01	1.86E−01	1.72E−01	1.40E−01	1.07E−01	8.76E−02	7.74E−02

TABLE 1. Predicted *S*-matrix differential elastic scattering cross sections for photon energies (50.0, 59.54, 145.4, 316.5, 411.8, 468.1, 661.6, 778.9, 964.0, 1004.8, 1112.1, 1274.5, 1408.0 and 1500.0). The angle integrated total cross sections for each element and energies are presented. ''total'' represents total cross sections from this work, ''rel ff'' represents total cross sections calculated from the relativistic form factor and ''nrl ff'' represents total cross sections calculated from the nonrelativistic form factor—Continued[a]

θ (deg)	Photon energy (keV)						
	50.0	59.5	145.4	316.5	411.8	468.1	661.6
Rhodium ($Z=45$)							
0.00	1.62E+02	1.62E+02	1.60E+02	1.59E+02	1.59E+02	1.59E+02	1.59E+02
0.01	1.62E+02	1.62E+02	1.60E+02	1.59E+02	1.59E+02	1.59E+02	1.59E+02
0.02	1.62E+02	1.62E+02	1.60E+02	1.59E+02	1.59E+02	1.59E+02	1.59E+02
0.04	1.62E+02	1.62E+02	1.60E+02	1.59E+02	1.59E+02	1.59E+02	1.58E+02
0.06	1.62E+02	1.62E+02	1.60E+02	1.59E+02	1.58E+02	1.58E+02	1.57E+02
0.10	1.62E+02	1.62E+02	1.60E+02	1.58E+02	1.56E+02	1.56E+02	1.52E+02
0.20	1.62E+02	1.62E+02	1.59E+02	1.53E+02	1.49E+02	1.46E+02	1.37E+02
0.30	1.62E+02	1.61E+02	1.57E+02	1.46E+02	1.39E+02	1.35E+02	1.20E+02
0.40	1.61E+02	1.61E+02	1.55E+02	1.39E+02	1.29E+02	1.23E+02	1.05E+02
0.50	1.61E+02	1.60E+02	1.52E+02	1.31E+02	1.19E+02	1.12E+02	9.13E+01
0.60	1.61E+02	1.60E+02	1.49E+02	1.23E+02	1.09E+02	1.02E+02	7.92E+01
0.70	1.60E+02	1.59E+02	1.45E+02	1.15E+02	1.00E+02	9.20E+01	6.89E+01
0.80	1.60E+02	1.58E+02	1.42E+02	1.08E+02	9.17E+01	8.32E+01	6.00E+01
1.00	1.59E+02	1.56E+02	1.34E+02	9.43E+01	7.69E+01	6.83E+01	4.64E+01
1.20	1.57E+02	1.54E+02	1.27E+02	8.23E+01	6.46E+01	5.64E+01	3.69E+01
1.50	1.54E+02	1.50E+02	1.16E+02	6.73E+01	5.04E+01	4.33E+01	2.75E+01
1.70	1.52E+02	1.47E+02	1.09E+02	5.91E+01	4.33E+01	3.69E+01	2.31E+01
2.00	1.48E+02	1.43E+02	9.98E+01	4.91E+01	3.52E+01	2.97E+01	1.79E+01
2.50	1.42E+02	1.35E+02	8.55E+01	3.72E+01	2.62E+01	2.15E+01	1.16E+01
3.00	1.36E+02	1.27E+02	7.32E+01	2.92E+01	2.01E+01	1.59E+01	7.47E+00
3.50	1.30E+02	1.20E+02	6.28E+01	2.34E+01	1.54E+01	1.18E+01	4.97E+00
4.00	1.24E+02	1.13E+02	5.43E+01	1.90E+01	1.17E+01	8.77E+00	3.54E+00
5.00	1.12E+02	9.97E+01	4.14E+01	1.26E+01	6.80E+00	4.98E+00	2.19E+00
6.00	1.00E+02	8.77E+01	3.27E+01	8.43E+00	4.21E+00	3.13E+00	1.57E+00
7.00	8.86E+01	7.73E+01	2.66E+01	5.74E+00	2.91E+00	2.19E+00	1.13E+00
8.00	7.80E+01	6.81E+01	2.20E+01	4.07E+00	2.21E+00	1.67E+00	7.87E−01
9.00	6.91E+01	6.02E+01	1.83E+01	3.04E+00	1.78E+00	1.32E+00	5.38E−01
10.00	6.17E+01	5.34E+01	1.51E+01	2.38E+00	1.46E+00	1.06E+00	3.70E−01
12.50	4.90E+01	4.05E+01	9.30E+00	1.49E+00	8.52E−01	5.81E−01	1.71E−01
15.00	4.07E+01	3.18E+01	5.80E+00	1.00E+00	4.71E−01	3.13E−01	1.04E−01
17.50	3.43E+01	2.57E+01	3.86E+00	6.65E−01	2.70E−01	1.82E−01	7.42E−02
20.00	2.86E+01	2.10E+01	2.80E+00	4.37E−01	1.71E−01	1.18E−01	5.61E−02
22.50	2.35E+01	1.73E+01	2.18E+00	2.92E−01	1.20E−01	8.54E−02	4.23E−02
25.00	1.90E+01	1.41E+01	1.77E+00	2.02E−01	9.22E−02	6.65E−02	3.14E−02
27.50	1.52E+01	1.15E+01	1.47E+00	1.46E−01	7.44E−02	5.40E−02	2.29E−02
30.00	1.22E+01	9.33E+00	1.22E+00	1.11E−01	6.15E−02	4.44E−02	1.64E−02
35.00	8.01E+00	6.18E+00	8.12E−01	7.17E−02	4.27E−02	2.98E−02	8.34E−03
40.00	5.58E+00	4.23E+00	5.26E−01	5.12E−02	2.91E−02	1.92E−02	4.22E−03
45.00	4.15E+00	3.04E+00	3.41E−01	3.80E−02	1.93E−02	1.20E−02	2.18E−03
50.00	3.25E+00	2.30E+00	2.27E−01	2.85E−02	1.27E−02	7.48E−03	1.16E−03
55.00	2.66E+00	1.82E+00	1.58E−01	2.13E−02	8.38E−03	4.68E−03	6.46E−04
60.00	2.22E+00	1.48E+00	1.16E−01	1.59E−02	5.57E−03	2.98E−03	3.79E−04
65.00	1.89E+00	1.24E+00	9.00E−02	1.19E−02	3.78E−03	1.95E−03	2.36E−04
70.00	1.61E+00	1.05E+00	7.28E−02	8.94E−03	2.63E−03	1.32E−03	1.57E−04
75.00	1.39E+00	9.04E−01	6.13E−02	6.86E−03	1.90E−03	9.35E−04	1.12E−04
80.00	1.20E+00	7.87E−01	5.35E−02	5.39E−03	1.42E−03	6.92E−04	8.48E−05
85.00	1.05E+00	6.96E−01	4.80E−02	4.34E−03	1.11E−03	5.36E−04	6.82E−05
90.00	9.36E−01	6.24E−01	4.43E−02	3.60E−03	8.94E−04	4.33E−04	5.79E−05
95.00	8.45E−01	5.70E−01	4.18E−02	3.07E−03	7.50E−04	3.64E−04	5.11E−05
105.00	7.24E−01	5.00E−01	3.92E−02	2.40E−03	5.74E−04	2.81E−04	4.34E−05
120.00	6.42E−01	4.56E−01	3.88E−02	1.90E−03	4.49E−04	2.22E−04	3.88E−05
135.00	6.19E−01	4.48E−01	4.00E−02	1.66E−03	3.91E−04	1.96E−04	3.75E−05
150.00	6.20E−01	4.53E−01	4.14E−02	1.53E−03	3.60E−04	1.82E−04	3.74E−05
165.00	6.25E−01	4.60E−01	4.24E−02	1.47E−03	3.45E−04	1.76E−04	3.76E−05
180.00	6.28E−01	4.63E−01	4.27E−02	1.45E−03	3.41E−04	1.74E−04	3.77E−05
total	4.88E+01	3.76E+01	7.41E+00	1.66E+00	9.97E−01	7.73E−01	3.90E−01
rel ff	4.72E+01	3.53E+01	7.30E+00	1.68E+00	1.01E+00	7.90E−01	4.00E−01
nrl ff	4.83E+01	3.61E+01	7.55E+00	1.75E+00	1.06E+00	8.23E−01	4.17E−01

TABLE 1. Predicted *S*-matrix differential elastic scattering cross sections for photon energies (50.0, 59.54, 145.4, 316.5, 411.8, 468.1, 661.6, 778.9, 964.0, 1004.8, 1112.1, 1274.5, 1408.0 and 1500.0). The angle integrated total cross sections for each element and energies are presented. ''total'' represents total cross sections from this work, ''rel ff'' represents total cross sections calculated from the relativistic form factor and ''nrl ff'' represents total cross sections calculated from the nonrelativistic form factor—Continued[a]

θ (deg)	Photon energy (keV)						
	778.9	964.0	1004.8	1112.1	1274.5	1408.0	1500.0
Rhodium ($Z=45$)							
0.00	1.59E+02	1.59E+02	1.59E+02	1.59E+02	1.59E+02	1.59E+02	1.59E+02
0.01	1.59E+02	1.59E+02	1.59E+02	1.59E+02	1.59E+02	1.59E+02	1.58E+02
0.02	1.59E+02	1.59E+02	1.58E+02	1.58E+02	1.58E+02	1.57E+02	1.57E+02
0.04	1.57E+02	1.57E+02	1.56E+02	1.56E+02	1.55E+02	1.54E+02	1.53E+02
0.06	1.56E+02	1.54E+02	1.53E+02	1.52E+02	1.50E+02	1.48E+02	1.47E+02
0.10	1.50E+02	1.46E+02	1.45E+02	1.42E+02	1.38E+02	1.35E+02	1.32E+02
0.20	1.31E+02	1.22E+02	1.20E+02	1.14E+02	1.07E+02	1.01E+02	9.77E+01
0.30	1.12E+02	9.96E+01	9.70E+01	9.05E+01	8.15E+01	7.48E+01	7.06E+01
0.40	9.51E+01	8.10E+01	7.82E+01	7.14E+01	6.23E+01	5.59E+01	5.21E+01
0.50	8.05E+01	6.61E+01	6.33E+01	5.67E+01	4.83E+01	4.28E+01	3.97E+01
0.60	6.82E+01	5.43E+01	5.17E+01	4.57E+01	3.85E+01	3.40E+01	3.15E+01
0.70	5.81E+01	4.51E+01	4.28E+01	3.75E+01	3.14E+01	2.78E+01	2.60E+01
0.80	4.99E+01	3.81E+01	3.61E+01	3.14E+01	2.62E+01	2.32E+01	2.16E+01
1.00	3.78E+01	2.84E+01	2.68E+01	2.32E+01	1.89E+01	1.61E+01	1.45E+01
1.20	2.98E+01	2.21E+01	2.07E+01	1.76E+01	1.37E+01	1.09E+01	9.15E+00
1.50	2.17E+01	1.54E+01	1.43E+01	1.16E+01	8.32E+00	6.03E+00	4.67E+00
1.70	1.77E+01	1.19E+01	1.10E+01	8.70E+00	6.02E+00	4.31E+00	3.35E+00
2.00	1.31E+01	8.10E+00	7.31E+00	5.63E+00	3.90E+00	2.97E+00	2.50E+00
2.50	7.85E+00	4.42E+00	3.95E+00	3.03E+00	2.28E+00	2.06E+00	2.10E+00
3.00	4.92E+00	2.80E+00	2.52E+00	2.00E+00	1.59E+00	1.52E+00	1.59E+00
3.50	3.35E+00	2.06E+00	1.88E+00	1.54E+00	1.19E+00	9.99E−01	8.91E−01
4.00	2.48E+00	1.65E+00	1.52E+00	1.25E+00	8.85E−01	6.05E−01	4.28E−01
5.00	1.58E+00	1.06E+00	9.73E−01	7.57E−01	4.53E−01	2.42E−01	1.36E−01
6.00	1.07E+00	6.14E−01	5.44E−01	3.94E−01	2.31E−01	1.39E−01	9.32E−02
7.00	7.07E−01	3.46E−01	2.98E−01	2.08E−01	1.34E−01	1.06E−01	9.73E−02
8.00	4.61E−01	2.09E−01	1.79E−01	1.26E−01	9.10E−02	8.87E−02	1.02E−01
9.00	3.07E−01	1.41E−01	1.22E−01	8.94E−02	6.94E−02	7.26E−02	8.78E−02
10.00	2.14E−01	1.06E−01	9.38E−02	7.16E−02	5.67E−02	5.57E−02	6.09E−02
12.50	1.10E−01	6.88E−02	6.35E−02	5.19E−02	3.64E−02	2.40E−02	1.61E−02
15.00	7.13E−02	4.83E−02	4.47E−02	3.56E−02	2.11E−02	1.04E−02	5.16E−03
17.50	5.10E−02	3.16E−02	2.85E−02	2.09E−02	1.10E−02	5.05E−03	2.47E−03
20.00	3.68E−02	1.95E−02	1.69E−02	1.13E−02	5.47E−03	2.59E−03	1.39E−03
22.50	2.60E−02	1.18E−02	9.83E−03	6.03E−03	2.74E−03	1.35E−03	7.99E−04
25.00	1.79E−02	7.06E−03	5.72E−03	3.27E−03	1.40E−03	7.03E−04	4.42E−04
27.50	1.22E−02	4.26E−03	3.37E−03	1.82E−03	7.38E−04	3.68E−04	2.37E−04
30.00	8.18E−03	2.60E−03	2.02E−03	1.04E−03	4.02E−04	1.97E−04	1.27E−04
35.00	3.69E−03	1.01E−03	7.59E−04	3.66E−04	1.29E−04	5.98E−05	3.73E−05
40.00	1.70E−03	4.17E−04	3.08E−04	1.43E−04	4.84E−05	2.18E−05	1.33E−05
45.00	8.14E−04	1.87E−04	1.38E−04	6.36E−05	2.21E−05	1.04E−05	6.68E−06
50.00	4.11E−04	9.18E−05	6.78E−05	3.21E−05	1.21E−05	6.35E−06	4.46E−06
55.00	2.21E−04	5.00E−05	3.74E−05	1.87E−05	8.14E−06	5.07E−06	4.12E−06
60.00	1.29E−04	3.07E−05	2.35E−05	1.27E−05	6.49E−06	4.82E−06	4.53E−06
65.00	8.11E−05	2.09E−05	1.64E−05	9.59E−06	5.65E−06	4.78E−06	4.92E−06
70.00	5.59E−05	1.60E−05	1.29E−05	8.12E−06	5.37E−06	4.93E−06	5.30E−06
75.00	4.17E−05	1.33E−05	1.10E−05	7.47E−06	5.40E−06	5.16E−06	5.56E−06
80.00	3.34E−05	1.18E−05	1.00E−05	7.20E−06	5.53E−06	5.34E−06	5.61E−06
85.00	2.83E−05	1.11E−05	9.60E−06	7.23E−06	5.82E−06	5.57E−06	5.66E−06
90.00	2.52E−05	1.08E−05	9.50E−06	7.46E−06	6.20E−06	5.88E−06	5.77E−06
95.00	2.32E−05	1.07E−05	9.55E−06	7.75E−06	6.60E−06	6.17E−06	5.85E−06
105.00	2.13E−05	1.10E−05	1.01E−05	8.60E−06	7.57E−06	6.87E−06	6.15E−06
120.00	2.06E−05	1.21E−05	1.13E−05	1.01E−05	9.16E−06	8.04E−06	6.78E−06
135.00	2.12E−05	1.35E−05	1.29E−05	1.19E−05	1.09E−05	9.20E−06	7.32E−06
150.00	2.20E−05	1.49E−05	1.43E−05	1.35E−05	1.24E−05	1.02E−05	7.89E−06
165.00	2.26E−05	1.58E−05	1.53E−05	1.46E−05	1.35E−05	1.10E−05	8.35E−06
180.00	2.29E−05	1.61E−05	1.56E−05	1.50E−05	1.39E−05	1.13E−05	8.55E−06
total	2.81E−01	1.85E−01	1.70E−01	1.39E−01	1.05E−01	8.57E−02	7.63E−02
rel ff	2.90E−01	1.90E−01	1.75E−01	1.43E−01	1.09E−01	8.93E−02	7.89E−02
nrl ff	3.03E−01	1.98E−01	1.83E−01	1.49E−01	1.13E−01	9.32E−02	8.24E−02

TABLE 1. Predicted *S*-matrix differential elastic scattering cross sections for photon energies (50.0, 59.54, 145.4, 316.5, 411.8, 468.1, 661.6, 778.9, 964.0, 1004.8, 1112.1, 1274.5, 1408.0 and 1500.0). The angle integrated total cross sections for each element and energies are presented. ''total'' represents total cross sections from this work, ''rel ff'' represents total cross sections calculated from the relativistic form factor and ''nrl ff'' represents total cross sections calculated from the nonrelativistic form factor—Continued[a]

θ (deg)	Photon energy (keV)						
	50.0	59.5	145.4	316.5	411.8	468.1	661.6
Palladium ($Z=46$)							
0.00	1.69E+02	1.69E+02	1.67E+02	1.67E+02	1.66E+02	1.66E+02	1.66E+02
0.01	1.69E+02	1.69E+02	1.67E+02	1.66E+02	1.66E+02	1.66E+02	1.66E+02
0.02	1.69E+02	1.69E+02	1.67E+02	1.66E+02	1.66E+02	1.66E+02	1.66E+02
0.04	1.69E+02	1.69E+02	1.67E+02	1.66E+02	1.66E+02	1.66E+02	1.65E+02
0.06	1.69E+02	1.69E+02	1.67E+02	1.66E+02	1.65E+02	1.65E+02	1.64E+02
0.10	1.69E+02	1.69E+02	1.67E+02	1.65E+02	1.63E+02	1.63E+02	1.59E+02
0.20	1.69E+02	1.69E+02	1.66E+02	1.60E+02	1.56E+02	1.53E+02	1.43E+02
0.30	1.69E+02	1.69E+02	1.64E+02	1.53E+02	1.46E+02	1.41E+02	1.26E+02
0.40	1.69E+02	1.68E+02	1.62E+02	1.45E+02	1.35E+02	1.29E+02	1.10E+02
0.50	1.68E+02	1.68E+02	1.59E+02	1.37E+02	1.25E+02	1.18E+02	9.60E+01
0.60	1.68E+02	1.67E+02	1.56E+02	1.29E+02	1.15E+02	1.07E+02	8.33E+01
0.70	1.67E+02	1.66E+02	1.52E+02	1.21E+02	1.05E+02	9.67E+01	7.25E+01
0.80	1.67E+02	1.65E+02	1.48E+02	1.13E+02	9.64E+01	8.75E+01	6.31E+01
1.00	1.66E+02	1.63E+02	1.41E+02	9.91E+01	8.09E+01	7.18E+01	4.86E+01
1.20	1.64E+02	1.61E+02	1.33E+02	8.66E+01	6.79E+01	5.92E+01	3.84E+01
1.50	1.61E+02	1.57E+02	1.22E+02	7.08E+01	5.29E+01	4.53E+01	2.86E+01
1.70	1.59E+02	1.54E+02	1.15E+02	6.21E+01	4.53E+01	3.85E+01	2.41E+01
2.00	1.55E+02	1.49E+02	1.05E+02	5.15E+01	3.67E+01	3.10E+01	1.89E+01
2.50	1.49E+02	1.41E+02	9.00E+01	3.88E+01	2.72E+01	2.25E+01	1.25E+01
3.00	1.42E+02	1.34E+02	7.70E+01	3.04E+01	2.10E+01	1.69E+01	8.12E+00
3.50	1.36E+02	1.26E+02	6.61E+01	2.45E+01	1.64E+01	1.27E+01	5.38E+00
4.00	1.30E+02	1.19E+02	5.70E+01	2.00E+01	1.26E+01	9.47E+00	3.78E+00
5.00	1.18E+02	1.05E+02	4.33E+01	1.35E+01	7.39E+00	5.40E+00	2.29E+00
6.00	1.06E+02	9.23E+01	3.41E+01	9.10E+00	4.53E+00	3.34E+00	1.64E+00
7.00	9.37E+01	8.13E+01	2.77E+01	6.21E+00	3.07E+00	2.30E+00	1.20E+00
8.00	8.24E+01	7.16E+01	2.30E+01	4.39E+00	2.31E+00	1.74E+00	8.47E−01
9.00	7.27E+01	6.32E+01	1.92E+01	3.25E+00	1.85E+00	1.38E+00	5.85E−01
10.00	6.47E+01	5.60E+01	1.61E+01	2.52E+00	1.53E+00	1.11E+00	4.04E−01
12.50	5.07E+01	4.23E+01	1.01E+01	1.56E+00	9.13E−01	6.27E−01	1.84E−01
15.00	4.19E+01	3.31E+01	6.30E+00	1.06E+00	5.13E−01	3.42E−01	1.09E−01
17.50	3.55E+01	2.68E+01	4.15E+00	7.13E−01	2.94E−01	1.97E−01	7.72E−02
20.00	3.00E+01	2.20E+01	2.96E+00	4.74E−01	1.84E−01	1.26E−01	5.85E−02
22.50	2.49E+01	1.82E+01	2.28E+00	3.17E−01	1.28E−01	9.00E−02	4.45E−02
25.00	2.03E+01	1.50E+01	1.85E+00	2.19E−01	9.67E−02	6.94E−02	3.33E−02
27.50	1.64E+01	1.23E+01	1.54E+00	1.57E−01	7.75E−02	5.61E−02	2.45E−02
30.00	1.32E+01	1.01E+01	1.28E+00	1.18E−01	6.41E−02	4.63E−02	1.78E−02
35.00	8.72E+00	6.72E+00	8.70E−01	7.54E−02	4.48E−02	3.14E−02	9.18E−03
40.00	6.02E+00	4.58E+00	5.71E−01	5.34E−02	3.08E−02	2.06E−02	4.71E−03
45.00	4.41E+00	3.26E+00	3.72E−01	3.98E−02	2.08E−02	1.31E−02	2.45E−03
50.00	3.41E+00	2.44E+00	2.48E−01	3.00E−02	1.38E−02	8.23E−03	1.32E−03
55.00	2.76E+00	1.91E+00	1.72E−01	2.26E−02	9.18E−03	5.19E−03	7.37E−04
60.00	2.30E+00	1.55E+00	1.25E−01	1.70E−02	6.16E−03	3.33E−03	4.34E−04
65.00	1.96E+00	1.29E+00	9.61E−02	1.28E−02	4.21E−03	2.19E−03	2.71E−04
70.00	1.68E+00	1.10E+00	7.72E−02	9.73E−03	2.95E−03	1.50E−03	1.80E−04
75.00	1.46E+00	9.49E−01	6.47E−02	7.53E−03	2.14E−03	1.07E−03	1.28E−04
80.00	1.27E+00	8.30E−01	5.62E−02	5.95E−03	1.61E−03	7.92E−04	9.78E−05
85.00	1.12E+00	7.38E−01	5.04E−02	4.82E−03	1.26E−03	6.15E−04	7.87E−05
90.00	1.00E+00	6.65E−01	4.65E−02	4.02E−03	1.02E−03	4.98E−04	6.67E−05
95.00	9.12E−01	6.10E−01	4.39E−02	3.45E−03	8.59E−04	4.19E−04	5.88E−05
105.00	7.88E−01	5.40E−01	4.13E−02	2.72E−03	6.61E−04	3.25E−04	4.99E−05
120.00	7.05E−01	4.96E−01	4.11E−02	2.17E−03	5.20E−04	2.58E−04	4.44E−05
135.00	6.82E−01	4.89E−01	4.26E−02	1.90E−03	4.53E−04	2.27E−04	4.26E−05
150.00	6.83E−01	4.96E−01	4.42E−02	1.76E−03	4.18E−04	2.11E−04	4.23E−05
165.00	6.89E−01	5.03E−01	4.54E−02	1.69E−03	4.00E−04	2.04E−04	4.25E−05
180.00	6.91E−01	5.06E−01	4.58E−02	1.67E−03	3.95E−04	2.01E−04	4.25E−05
total	5.17E+01	3.98E+01	7.85E+00	1.76E+00	1.06E+00	8.19E−01	4.14E−01
rel ff	4.99E+01	3.74E+01	7.73E+00	1.78E+00	1.08E+00	8.38E−01	4.24E−01
nrl ff	5.11E+01	3.83E+01	8.00E+00	1.86E+00	1.12E+00	8.74E−01	4.44E−01

TABLE 1. Predicted *S*-matrix differential elastic scattering cross sections for photon energies (50.0, 59.54, 145.4, 316.5, 411.8, 468.1, 661.6, 778.9, 964.0, 1004.8, 1112.1, 1274.5, 1408.0 and 1500.0). The angle integrated total cross sections for each element and energies are presented. ''total'' represents total cross sections from this work, ''rel ff'' represents total cross sections calculated from the relativistic form factor and ''nrl ff'' represents total cross sections calculated from the nonrelativistic form factor—Continued[a]

θ (deg)	Photon energy (keV)						
	778.9	964.0	1004.8	1112.1	1274.5	1408.0	1500.0
Palladium ($Z=46$)							
0.00	1.66E+02	1.66E+02	1.66E+02	1.66E+02	1.66E+02	1.66E+02	1.66E+02
0.01	1.66E+02	1.66E+02	1.66E+02	1.66E+02	1.66E+02	1.66E+02	1.65E+02
0.02	1.66E+02	1.66E+02	1.66E+02	1.65E+02	1.65E+02	1.64E+02	1.64E+02
0.04	1.65E+02	1.64E+02	1.63E+02	1.63E+02	1.62E+02	1.61E+02	1.60E+02
0.06	1.63E+02	1.61E+02	1.60E+02	1.59E+02	1.57E+02	1.55E+02	1.53E+02
0.10	1.57E+02	1.52E+02	1.51E+02	1.49E+02	1.44E+02	1.41E+02	1.38E+02
0.20	1.37E+02	1.28E+02	1.25E+02	1.20E+02	1.12E+02	1.06E+02	1.03E+02
0.30	1.18E+02	1.05E+02	1.02E+02	9.52E+01	8.57E+01	7.87E+01	7.43E+01
0.40	9.99E+01	8.53E+01	8.23E+01	7.51E+01	6.55E+01	5.87E+01	5.46E+01
0.50	8.47E+01	6.95E+01	6.66E+01	5.95E+01	5.07E+01	4.48E+01	4.13E+01
0.60	7.17E+01	5.70E+01	5.42E+01	4.79E+01	4.02E+01	3.53E+01	3.27E+01
0.70	6.10E+01	4.72E+01	4.48E+01	3.92E+01	3.27E+01	2.89E+01	2.70E+01
0.80	5.23E+01	3.97E+01	3.76E+01	3.27E+01	2.73E+01	2.42E+01	2.27E+01
1.00	3.95E+01	2.95E+01	2.79E+01	2.41E+01	1.98E+01	1.72E+01	1.57E+01
1.20	3.10E+01	2.30E+01	2.17E+01	1.85E+01	1.46E+01	1.18E+01	1.01E+01
1.50	2.27E+01	1.63E+01	1.52E+01	1.25E+01	9.03E+00	6.55E+00	5.06E+00
1.70	1.87E+01	1.29E+01	1.18E+01	9.47E+00	6.55E+00	4.63E+00	3.52E+00
2.00	1.40E+01	8.82E+00	7.98E+00	6.17E+00	4.21E+00	3.10E+00	2.52E+00
2.50	8.51E+00	4.79E+00	4.27E+00	3.25E+00	2.40E+00	2.12E+00	2.11E+00
3.00	5.31E+00	2.96E+00	2.65E+00	2.08E+00	1.65E+00	1.60E+00	1.73E+00
3.50	3.57E+00	2.13E+00	1.94E+00	1.57E+00	1.24E+00	1.10E+00	1.04E+00
4.00	2.61E+00	1.70E+00	1.57E+00	1.29E+00	9.36E−01	6.73E−01	5.04E−01
5.00	1.66E+00	1.13E+00	1.04E+00	8.17E−01	4.94E−01	2.63E−01	1.46E−01
6.00	1.13E+00	6.70E−01	5.97E−01	4.37E−01	2.53E−01	1.45E−01	9.17E−02
7.00	7.60E−01	3.80E−01	3.29E−01	2.30E−01	1.45E−01	1.08E−01	9.36E−02
8.00	5.01E−01	2.28E−01	1.95E−01	1.37E−01	9.61E−02	9.07E−02	1.01E−01
9.00	3.34E−01	1.51E−01	1.30E−01	9.41E−02	7.22E−02	7.57E−02	9.25E−02
10.00	2.32E−01	1.12E−01	9.80E−02	7.39E−02	5.85E−02	5.94E−02	6.79E−02
12.50	1.16E−01	7.10E−02	6.53E−02	5.31E−02	3.80E−02	2.63E−02	1.87E−02
15.00	7.45E−02	5.05E−02	4.69E−02	3.76E−02	2.27E−02	1.14E−02	5.76E−03
17.50	5.33E−02	3.37E−02	3.05E−02	2.27E−02	1.21E−02	5.55E−03	2.67E−03
20.00	3.88E−02	2.12E−02	1.85E−02	1.25E−02	6.14E−03	2.87E−03	1.50E−03
22.50	2.77E−02	1.29E−02	1.09E−02	6.77E−03	3.10E−03	1.51E−03	8.76E−04
25.00	1.93E−02	7.84E−03	6.39E−03	3.70E−03	1.60E−03	7.97E−04	4.94E−04
27.50	1.33E−02	4.77E−03	3.79E−03	2.07E−03	8.46E−04	4.22E−04	2.69E−04
30.00	9.01E−03	2.93E−03	2.28E−03	1.19E−03	4.63E−04	2.27E−04	1.46E−04
35.00	4.12E−03	1.15E−03	8.66E−04	4.20E−04	1.49E−04	6.92E−05	4.31E−05
40.00	1.92E−03	4.77E−04	3.54E−04	1.65E−04	5.57E−05	2.50E−05	1.52E−05
45.00	9.27E−04	2.15E−04	1.58E−04	7.29E−05	2.52E−05	1.18E−05	7.47E−06
50.00	4.70E−04	1.05E−04	7.77E−05	3.66E−05	1.36E−05	7.03E−06	4.88E−06
55.00	2.54E−04	5.72E−05	4.27E−05	2.12E−05	9.04E−06	5.52E−06	4.43E−06
60.00	1.48E−04	3.50E−05	2.67E−05	1.43E−05	7.14E−06	5.21E−06	4.83E−06
65.00	9.32E−05	2.37E−05	1.85E−05	1.07E−05	6.17E−06	5.14E−06	5.25E−06
70.00	6.41E−05	1.80E−05	1.45E−05	8.99E−06	5.83E−06	5.29E−06	5.67E−06
75.00	4.77E−05	1.50E−05	1.23E−05	8.22E−06	5.83E−06	5.53E−06	5.95E−06
80.00	3.82E−05	1.32E−05	1.12E−05	7.89E−06	5.96E−06	5.71E−06	6.03E−06
85.00	3.23E−05	1.23E−05	1.06E−05	7.89E−06	6.24E−06	5.97E−06	6.10E−06
90.00	2.87E−05	1.20E−05	1.05E−05	8.11E−06	6.65E−06	6.30E−06	6.24E−06
95.00	2.64E−05	1.18E−05	1.05E−05	8.40E−06	7.05E−06	6.60E−06	6.34E−06
105.00	2.41E−05	1.21E−05	1.10E−05	9.27E−06	8.06E−06	7.35E−06	6.68E−06
120.00	2.32E−05	1.32E−05	1.23E−05	1.08E−05	9.71E−06	8.58E−06	7.36E−06
135.00	2.37E−05	1.47E−05	1.39E−05	1.27E−05	1.15E−05	9.81E−06	7.93E−06
150.00	2.44E−05	1.60E−05	1.53E−05	1.43E−05	1.31E−05	1.09E−05	8.54E−06
165.00	2.51E−05	1.70E−05	1.64E−05	1.54E−05	1.42E−05	1.17E−05	9.02E−06
180.00	2.53E−05	1.74E−05	1.67E−05	1.58E−05	1.46E−05	1.20E−05	9.22E−06
total	2.98E−01	1.96E−01	1.80E−01	1.48E−01	1.12E−01	9.09E−02	8.10E−02
rel ff	3.08E−01	2.02E−01	1.86E−01	1.52E−01	1.15E−01	9.48E−02	8.37E−02
nrl ff	3.22E−01	2.11E−01	1.94E−01	1.58E−01	1.21E−01	9.92E−02	8.76E−02

TABLE 1. Predicted *S*-matrix differential elastic scattering cross sections for photon energies (50.0, 59.54, 145.4, 316.5, 411.8, 468.1, 661.6, 778.9, 964.0, 1004.8, 1112.1, 1274.5, 1408.0 and 1500.0). The angle integrated total cross sections for each element and energies are presented. ''total'' represents total cross sections from this work, ''rel ff'' represents total cross sections calculated from the relativistic form factor and ''nrl ff'' represents total cross sections calculated from the nonrelativistic form factor—Continued[a]

θ (deg)	Photon energy (keV)						
	50.0	59.5	145.4	316.5	411.8	468.1	661.6
Silver ($Z=47$)							
0.00	1.77E+02	1.77E+02	1.75E+02	1.74E+02	1.74E+02	1.74E+02	1.74E+02
0.01	1.77E+02	1.77E+02	1.75E+02	1.74E+02	1.74E+02	1.74E+02	1.73E+02
0.02	1.77E+02	1.77E+02	1.75E+02	1.74E+02	1.74E+02	1.73E+02	1.73E+02
0.04	1.77E+02	1.77E+02	1.74E+02	1.74E+02	1.73E+02	1.73E+02	1.72E+02
0.06	1.77E+02	1.76E+02	1.74E+02	1.73E+02	1.73E+02	1.72E+02	1.71E+02
0.10	1.77E+02	1.76E+02	1.74E+02	1.72E+02	1.71E+02	1.70E+02	1.66E+02
0.20	1.77E+02	1.76E+02	1.73E+02	1.67E+02	1.63E+02	1.60E+02	1.50E+02
0.30	1.77E+02	1.76E+02	1.71E+02	1.60E+02	1.52E+02	1.48E+02	1.32E+02
0.40	1.76E+02	1.75E+02	1.69E+02	1.52E+02	1.41E+02	1.35E+02	1.16E+02
0.50	1.76E+02	1.75E+02	1.66E+02	1.43E+02	1.30E+02	1.23E+02	1.01E+02
0.60	1.75E+02	1.74E+02	1.63E+02	1.35E+02	1.20E+02	1.12E+02	8.75E+01
0.70	1.75E+02	1.73E+02	1.59E+02	1.26E+02	1.10E+02	1.01E+02	7.61E+01
0.80	1.74E+02	1.73E+02	1.55E+02	1.19E+02	1.01E+02	9.19E+01	6.62E+01
1.00	1.73E+02	1.70E+02	1.47E+02	1.04E+02	8.49E+01	7.54E+01	5.08E+01
1.20	1.71E+02	1.68E+02	1.39E+02	9.09E+01	7.13E+01	6.21E+01	4.01E+01
1.50	1.68E+02	1.64E+02	1.28E+02	7.44E+01	5.54E+01	4.74E+01	2.98E+01
1.70	1.66E+02	1.61E+02	1.21E+02	6.52E+01	4.74E+01	4.02E+01	2.51E+01
2.00	1.62E+02	1.56E+02	1.10E+02	5.40E+01	3.83E+01	3.23E+01	1.99E+01
2.50	1.55E+02	1.48E+02	9.45E+01	4.06E+01	2.84E+01	2.36E+01	1.34E+01
3.00	1.49E+02	1.40E+02	8.09E+01	3.17E+01	2.20E+01	1.78E+01	8.78E+00
3.50	1.42E+02	1.32E+02	6.94E+01	2.55E+01	1.73E+01	1.35E+01	5.82E+00
4.00	1.36E+02	1.24E+02	5.98E+01	2.10E+01	1.35E+01	1.02E+01	4.04E+00
5.00	1.24E+02	1.10E+02	4.52E+01	1.44E+01	8.00E+00	5.83E+00	2.39E+00
6.00	1.11E+02	9.69E+01	3.55E+01	9.78E+00	4.88E+00	3.58E+00	1.71E+00
7.00	9.88E+01	8.54E+01	2.89E+01	6.70E+00	3.26E+00	2.43E+00	1.26E+00
8.00	8.69E+01	7.52E+01	2.40E+01	4.72E+00	2.42E+00	1.81E+00	9.07E−01
9.00	7.65E+01	6.64E+01	2.02E+01	3.47E+00	1.93E+00	1.44E+00	6.33E−01
10.00	6.77E+01	5.87E+01	1.71E+01	2.67E+00	1.60E+00	1.17E+00	4.40E−01
12.50	5.25E+01	4.42E+01	1.09E+01	1.63E+00	9.75E−01	6.73E−01	1.98E−01
15.00	4.32E+01	3.45E+01	6.83E+00	1.11E+00	5.57E−01	3.71E−01	1.15E−01
17.50	3.67E+01	2.79E+01	4.46E+00	7.61E−01	3.20E−01	2.13E−01	8.05E−02
20.00	3.13E+01	2.30E+01	3.14E+00	5.11E−01	1.98E−01	1.35E−01	6.10E−02
22.50	2.63E+01	1.92E+01	2.39E+00	3.44E−01	1.36E−01	9.50E−02	4.67E−02
25.00	2.17E+01	1.59E+01	1.93E+00	2.37E−01	1.02E−01	7.26E−02	3.53E−02
27.50	1.77E+01	1.32E+01	1.60E+00	1.70E−01	8.09E−02	5.84E−02	2.62E−02
30.00	1.43E+01	1.08E+01	1.35E+00	1.27E−01	6.68E−02	4.83E−02	1.92E−02
35.00	9.45E+00	7.27E+00	9.28E−01	7.95E−02	4.69E−02	3.31E−02	1.01E−02
40.00	6.48E+00	4.94E+00	6.17E−01	5.59E−02	3.26E−02	2.20E−02	5.23E−03
45.00	4.68E+00	3.49E+00	4.05E−01	4.16E−02	2.22E−02	1.42E−02	2.75E−03
50.00	3.58E+00	2.58E+00	2.70E−01	3.15E−02	1.49E−02	9.00E−03	1.49E−03
55.00	2.87E+00	2.00E+00	1.87E−01	2.39E−02	1.00E−02	5.73E−03	8.37E−04
60.00	2.39E+00	1.62E+00	1.35E−01	1.81E−02	6.77E−03	3.71E−03	4.95E−04
65.00	2.03E+00	1.35E+00	1.03E−01	1.37E−02	4.66E−03	2.46E−03	3.10E−04
70.00	1.75E+00	1.15E+00	8.20E−02	1.05E−02	3.29E−03	1.69E−03	2.07E−04
75.00	1.53E+00	9.94E−01	6.83E−02	8.22E−03	2.40E−03	1.21E−03	1.47E−04
80.00	1.34E+00	8.73E−01	5.91E−02	6.54E−03	1.82E−03	9.01E−04	1.12E−04
85.00	1.19E+00	7.79E−01	5.29E−02	5.33E−03	1.43E−03	7.02E−04	9.04E−05
90.00	1.07E+00	7.06E−01	4.88E−02	4.47E−03	1.16E−03	5.71E−04	7.67E−05
95.00	9.78E−01	6.51E−01	4.60E−02	3.85E−03	9.80E−04	4.82E−04	6.76E−05
105.00	8.53E−01	5.80E−01	4.34E−02	3.06E−03	7.58E−04	3.74E−04	5.72E−05
120.00	7.69E−01	5.37E−01	4.34E−02	2.46E−03	5.98E−04	2.98E−04	5.06E−05
135.00	7.47E−01	5.31E−01	4.52E−02	2.17E−03	5.22E−04	2.62E−04	4.84E−05
150.00	7.48E−01	5.39E−01	4.71E−02	2.01E−03	4.82E−04	2.44E−04	4.78E−05
165.00	7.55E−01	5.47E−01	4.84E−02	1.93E−03	4.62E−04	2.35E−04	4.78E−05
180.00	7.57E−01	5.50E−01	4.89E−02	1.91E−03	4.56E−04	2.32E−04	4.79E−05
total	5.46E+01	4.21E+01	8.31E+00	1.86E+00	1.12E+00	8.67E−01	4.38E−01
rel ff	5.27E+01	3.95E+01	8.17E+00	1.89E+00	1.14E+00	8.86E−01	4.49E−01
nrl ff	5.40E+01	4.05E+01	8.48E+00	1.97E+00	1.19E+00	9.28E−01	4.71E−01

TABLE 1. Predicted *S*-matrix differential elastic scattering cross sections for photon energies (50.0, 59.54, 145.4, 316.5, 411.8, 468.1, 661.6, 778.9, 964.0, 1004.8, 1112.1, 1274.5, 1408.0 and 1500.0). The angle integrated total cross sections for each element and energies are presented. ''total'' represents total cross sections from this work, ''rel ff'' represents total cross sections calculated from the relativistic form factor and ''nrl ff'' represents total cross sections calculated from the nonrelativistic form factor—Continued[a]

θ (deg)	Photon energy (keV)						
	778.9	964.0	1004.8	1112.1	1274.5	1408.0	1500.0
Silver ($Z=47$)							
0.00	1.73E+02	1.73E+02	1.73E+02	1.73E+02	1.73E+02	1.73E+02	1.73E+02
0.01	1.73E+02	1.73E+02	1.73E+02	1.73E+02	1.73E+02	1.73E+02	1.73E+02
0.02	1.73E+02	1.73E+02	1.73E+02	1.72E+02	1.72E+02	1.72E+02	1.71E+02
0.04	1.72E+02	1.71E+02	1.71E+02	1.70E+02	1.69E+02	1.68E+02	1.67E+02
0.06	1.70E+02	1.68E+02	1.67E+02	1.66E+02	1.64E+02	1.62E+02	1.60E+02
0.10	1.64E+02	1.59E+02	1.58E+02	1.55E+02	1.51E+02	1.47E+02	1.45E+02
0.20	1.44E+02	1.33E+02	1.31E+02	1.26E+02	1.18E+02	1.12E+02	1.08E+02
0.30	1.23E+02	1.10E+02	1.07E+02	9.99E+01	9.00E+01	8.27E+01	7.80E+01
0.40	1.05E+02	8.95E+01	8.65E+01	7.89E+01	6.87E+01	6.15E+01	5.72E+01
0.50	8.89E+01	7.30E+01	6.99E+01	6.25E+01	5.31E+01	4.68E+01	4.31E+01
0.60	7.53E+01	5.97E+01	5.69E+01	5.01E+01	4.19E+01	3.68E+01	3.40E+01
0.70	6.41E+01	4.94E+01	4.68E+01	4.09E+01	3.41E+01	3.01E+01	2.81E+01
0.80	5.48E+01	4.15E+01	3.92E+01	3.41E+01	2.84E+01	2.53E+01	2.38E+01
1.00	4.12E+01	3.07E+01	2.90E+01	2.51E+01	2.08E+01	1.82E+01	1.68E+01
1.20	3.23E+01	2.40E+01	2.26E+01	1.94E+01	1.55E+01	1.27E+01	1.10E+01
1.50	2.37E+01	1.73E+01	1.61E+01	1.34E+01	9.75E+00	7.10E+00	5.47E+00
1.70	1.97E+01	1.37E+01	1.27E+01	1.02E+01	7.10E+00	4.97E+00	3.72E+00
2.00	1.49E+01	9.55E+00	8.67E+00	6.72E+00	4.54E+00	3.25E+00	2.56E+00
2.50	9.17E+00	5.18E+00	4.62E+00	3.49E+00	2.53E+00	2.18E+00	2.13E+00
3.00	5.73E+00	3.14E+00	2.80E+00	2.17E+00	1.72E+00	1.69E+00	1.86E+00
3.50	3.81E+00	2.22E+00	2.01E+00	1.61E+00	1.29E+00	1.19E+00	1.19E+00
4.00	2.76E+00	1.76E+00	1.62E+00	1.33E+00	9.87E−01	7.44E−01	5.87E−01
5.00	1.73E+00	1.19E+00	1.10E+00	8.76E−01	5.36E−01	2.87E−01	1.58E−01
6.00	1.19E+00	7.26E−01	6.51E−01	4.81E−01	2.77E−01	1.53E−01	9.17E−02
7.00	8.13E−01	4.16E−01	3.62E−01	2.54E−01	1.56E−01	1.11E−01	9.07E−02
8.00	5.42E−01	2.48E−01	2.12E−01	1.48E−01	1.02E−01	9.28E−02	1.00E−01
9.00	3.63E−01	1.62E−01	1.39E−01	9.96E−02	7.54E−02	7.85E−02	9.61E−02
10.00	2.51E−01	1.18E−01	1.03E−01	7.66E−02	6.06E−02	6.29E−02	7.44E−02
12.50	1.23E−01	7.34E−02	6.71E−02	5.43E−02	3.97E−02	2.88E−02	2.17E−02
15.00	7.79E−02	5.27E−02	4.89E−02	3.95E−02	2.43E−02	1.25E−02	6.45E−03
17.50	5.56E−02	3.58E−02	3.26E−02	2.46E−02	1.33E−02	6.08E−03	2.90E−03
20.00	4.07E−02	2.29E−02	2.01E−02	1.38E−02	6.85E−03	3.17E−03	1.63E−03
22.50	2.94E−02	1.41E−02	1.20E−02	7.56E−03	3.50E−03	1.69E−03	9.58E−04
25.00	2.08E−02	8.66E−03	7.10E−03	4.17E−03	1.82E−03	9.00E−04	5.49E−04
27.50	1.44E−02	5.32E−03	4.25E−03	2.35E−03	9.67E−04	4.80E−04	3.04E−04
30.00	9.88E−03	3.29E−03	2.57E−03	1.35E−03	5.31E−04	2.61E−04	1.67E−04
35.00	4.59E−03	1.30E−03	9.84E−04	4.81E−04	1.72E−04	7.98E−05	4.97E−05
40.00	2.16E−03	5.45E−04	4.05E−04	1.89E−04	6.40E−05	2.87E−05	1.75E−05
45.00	1.05E−03	2.46E−04	1.81E−04	8.34E−05	2.86E−05	1.33E−05	8.38E−06
50.00	5.37E−04	1.21E−04	8.89E−05	4.17E−05	1.53E−05	7.79E−06	5.35E−06
55.00	2.90E−04	6.53E−05	4.87E−05	2.40E−05	1.01E−05	6.04E−06	4.78E−06
60.00	1.69E−04	3.98E−05	3.02E−05	1.60E−05	7.87E−06	5.64E−06	5.17E−06
65.00	1.07E−04	2.69E−05	2.09E−05	1.19E−05	6.75E−06	5.53E−06	5.61E−06
70.00	7.34E−05	2.03E−05	1.62E−05	9.97E−06	6.34E−06	5.69E−06	6.07E−06
75.00	5.46E−05	1.68E−05	1.38E−05	9.06E−06	6.32E−06	5.93E−06	6.39E−06
80.00	4.36E−05	1.48E−05	1.24E−05	8.67E−06	6.43E−06	6.12E−06	6.47E−06
85.00	3.68E−05	1.38E−05	1.18E−05	8.63E−06	6.72E−06	6.40E−06	6.57E−06
90.00	3.27E−05	1.33E−05	1.16E−05	8.83E−06	7.13E−06	6.75E−06	6.74E−06
95.00	3.00E−05	1.31E−05	1.16E−05	9.11E−06	7.55E−06	7.07E−06	6.86E−06
105.00	2.72E−05	1.33E−05	1.21E−05	1.00E−05	8.59E−06	7.87E−06	7.24E−06
120.00	2.61E−05	1.44E−05	1.33E−05	1.16E−05	1.03E−05	9.17E−06	7.98E−06
135.00	2.64E−05	1.59E−05	1.50E−05	1.35E−05	1.22E−05	1.05E−05	8.59E−06
150.00	2.71E−05	1.73E−05	1.65E−05	1.52E−05	1.38E−05	1.16E−05	9.23E−06
165.00	2.78E−05	1.83E−05	1.75E−05	1.63E−05	1.49E−05	1.24E−05	9.74E−06
180.00	2.80E−05	1.87E−05	1.79E−05	1.68E−05	1.54E−05	1.28E−05	9.95E−06
total	3.16E−01	2.07E−01	1.91E−01	1.56E−01	1.18E−01	9.62E−02	8.59E−02
rel ff	3.26E−01	2.14E−01	1.97E−01	1.60E−01	1.22E−01	1.00E−01	8.87E−02
nrl ff	3.42E−01	2.24E−01	2.06E−01	1.68E−01	1.28E−01	1.05E−01	9.31E−02

TABLE 1. Predicted *S*-matrix differential elastic scattering cross sections for photon energies (50.0, 59.54, 145.4, 316.5, 411.8, 468.1, 661.6, 778.9, 964.0, 1004.8, 1112.1, 1274.5, 1408.0 and 1500.0). The angle integrated total cross sections for each element and energies are presented. ''total'' represents total cross sections from this work, ''rel ff'' represents total cross sections calculated from the relativistic form factor and ''nrl ff'' represents total cross sections calculated from the nonrelativistic form factor—Continued[a]

θ (deg)	Photon energy (keV)						
	50.0	59.5	145.4	316.5	411.8	468.1	661.6
Cadmium ($Z=48$)							
0.00	1.84E+02	1.84E+02	1.82E+02	1.81E+02	1.81E+02	1.81E+02	1.81E+02
0.01	1.84E+02	1.84E+02	1.82E+02	1.81E+02	1.81E+02	1.81E+02	1.81E+02
0.02	1.84E+02	1.84E+02	1.82E+02	1.81E+02	1.81E+02	1.81E+02	1.81E+02
0.04	1.84E+02	1.84E+02	1.82E+02	1.81E+02	1.81E+02	1.80E+02	1.80E+02
0.06	1.84E+02	1.84E+02	1.82E+02	1.81E+02	1.80E+02	1.79E+02	1.78E+02
0.10	1.84E+02	1.84E+02	1.82E+02	1.79E+02	1.78E+02	1.77E+02	1.73E+02
0.20	1.84E+02	1.84E+02	1.81E+02	1.74E+02	1.70E+02	1.67E+02	1.57E+02
0.30	1.84E+02	1.83E+02	1.79E+02	1.67E+02	1.59E+02	1.54E+02	1.38E+02
0.40	1.84E+02	1.83E+02	1.76E+02	1.58E+02	1.48E+02	1.41E+02	1.21E+02
0.50	1.83E+02	1.82E+02	1.73E+02	1.50E+02	1.36E+02	1.29E+02	1.06E+02
0.60	1.83E+02	1.82E+02	1.70E+02	1.41E+02	1.26E+02	1.17E+02	9.18E+01
0.70	1.82E+02	1.81E+02	1.66E+02	1.32E+02	1.15E+02	1.06E+02	7.98E+01
0.80	1.82E+02	1.80E+02	1.62E+02	1.24E+02	1.06E+02	9.64E+01	6.94E+01
1.00	1.80E+02	1.78E+02	1.54E+02	1.09E+02	8.91E+01	7.91E+01	5.32E+01
1.20	1.79E+02	1.75E+02	1.46E+02	9.53E+01	7.48E+01	6.51E+01	4.19E+01
1.50	1.75E+02	1.71E+02	1.34E+02	7.80E+01	5.80E+01	4.95E+01	3.10E+01
1.70	1.73E+02	1.68E+02	1.26E+02	6.83E+01	4.95E+01	4.20E+01	2.62E+01
2.00	1.69E+02	1.63E+02	1.15E+02	5.65E+01	3.99E+01	3.37E+01	2.09E+01
2.50	1.62E+02	1.54E+02	9.91E+01	4.24E+01	2.96E+01	2.46E+01	1.43E+01
3.00	1.55E+02	1.46E+02	8.49E+01	3.31E+01	2.31E+01	1.87E+01	9.46E+00
3.50	1.49E+02	1.38E+02	7.28E+01	2.67E+01	1.83E+01	1.43E+01	6.27E+00
4.00	1.43E+02	1.30E+02	6.26E+01	2.20E+01	1.44E+01	1.09E+01	4.32E+00
5.00	1.30E+02	1.15E+02	4.73E+01	1.52E+01	8.63E+00	6.28E+00	2.51E+00
6.00	1.17E+02	1.02E+02	3.71E+01	1.05E+01	5.24E+00	3.83E+00	1.78E+00
7.00	1.04E+02	8.95E+01	3.01E+01	7.21E+00	3.46E+00	2.57E+00	1.33E+00
8.00	9.14E+01	7.88E+01	2.51E+01	5.07E+00	2.53E+00	1.90E+00	9.67E−01
9.00	8.03E+01	6.96E+01	2.13E+01	3.70E+00	2.02E+00	1.51E+00	6.82E−01
10.00	7.08E+01	6.15E+01	1.80E+01	2.83E+00	1.67E+00	1.23E+00	4.77E−01
12.50	5.44E+01	4.62E+01	1.17E+01	1.71E+00	1.04E+00	7.20E−01	2.13E−01
15.00	4.46E+01	3.60E+01	7.37E+00	1.17E+00	6.02E−01	4.01E−01	1.21E−01
17.50	3.80E+01	2.90E+01	4.79E+00	8.10E−01	3.47E−01	2.31E−01	8.40E−02
20.00	3.26E+01	2.40E+01	3.34E+00	5.49E−01	2.14E−01	1.45E−01	6.36E−02
22.50	2.76E+01	2.01E+01	2.52E+00	3.71E−01	1.44E−01	1.00E−01	4.89E−02
25.00	2.30E+01	1.68E+01	2.02E+00	2.56E−01	1.07E−01	7.60E−02	3.72E−02
27.50	1.89E+01	1.40E+01	1.68E+00	1.83E−01	8.46E−02	6.09E−02	2.79E−02
30.00	1.54E+01	1.16E+01	1.41E+00	1.35E−01	6.96E−02	5.03E−02	2.06E−02
35.00	1.02E+01	7.82E+00	9.85E−01	8.39E−02	4.90E−02	3.47E−02	1.10E−02
40.00	6.95E+00	5.31E+00	6.64E−01	5.85E−02	3.44E−02	2.34E−02	5.77E−03
45.00	4.97E+00	3.73E+00	4.40E−01	4.35E−02	2.37E−02	1.52E−02	3.07E−03
50.00	3.76E+00	2.73E+00	2.94E−01	3.30E−02	1.61E−02	9.80E−03	1.67E−03
55.00	2.99E+00	2.11E+00	2.03E−01	2.52E−02	1.09E−02	6.31E−03	9.47E−04
60.00	2.48E+00	1.69E+00	1.46E−01	1.92E−02	7.42E−03	4.11E−03	5.62E−04
65.00	2.11E+00	1.41E+00	1.10E−01	1.47E−02	5.14E−03	2.75E−03	3.53E−04
70.00	1.82E+00	1.20E+00	8.72E−02	1.14E−02	3.66E−03	1.90E−03	2.36E−04
75.00	1.59E+00	1.04E+00	7.23E−02	8.93E−03	2.68E−03	1.36E−03	1.69E−04
80.00	1.41E+00	9.16E−01	6.24E−02	7.15E−03	2.04E−03	1.02E−03	1.29E−04
85.00	1.26E+00	8.20E−01	5.57E−02	5.87E−03	1.61E−03	7.99E−04	1.04E−04
90.00	1.14E+00	7.46E−01	5.13E−02	4.95E−03	1.31E−03	6.51E−04	8.79E−05
95.00	1.04E+00	6.91E−01	4.84E−02	4.28E−03	1.11E−03	5.51E−04	7.74E−05
105.00	9.17E−01	6.20E−01	4.57E−02	3.42E−03	8.65E−04	4.29E−04	6.54E−05
120.00	8.34E−01	5.78E−01	4.59E−02	2.77E−03	6.85E−04	3.42E−04	5.76E−05
135.00	8.13E−01	5.74E−01	4.79E−02	2.46E−03	5.99E−04	3.01E−04	5.48E−05
150.00	8.16E−01	5.83E−01	5.01E−02	2.29E−03	5.54E−04	2.80E−04	5.40E−05
165.00	8.23E−01	5.92E−01	5.16E−02	2.20E−03	5.31E−04	2.70E−04	5.38E−05
180.00	8.26E−01	5.96E−01	5.21E−02	2.17E−03	5.24E−04	2.67E−04	5.38E−05
total	5.75E+01	4.43E+01	8.78E+00	1.97E+00	1.18E+00	9.17E−01	4.63E−01
rel ff	5.55E+01	4.16E+01	8.62E+00	1.99E+00	1.20E+00	9.37E−01	4.75E−01
nrl ff	5.70E+01	4.28E+01	8.97E+00	2.09E+00	1.26E+00	9.84E−01	4.99E−01

TABLE 1. Predicted *S*-matrix differential elastic scattering cross sections for photon energies (50.0, 59.54, 145.4, 316.5, 411.8, 468.1, 661.6, 778.9, 964.0, 1004.8, 1112.1, 1274.5, 1408.0 and 1500.0). The angle integrated total cross sections for each element and energies are presented. ''total'' represents total cross sections from this work, ''rel ff'' represents total cross sections calculated from the relativistic form factor and ''nrl ff'' represents total cross sections calculated from the nonrelativistic form factor—Continued[a]

θ (deg)	Photon energy (keV)						
	778.9	964.0	1004.8	1112.1	1274.5	1408.0	1500.0
Cadmium ($Z=48$)							
0.00	1.81E+02	1.81E+02	1.81E+02	1.81E+02	1.81E+02	1.80E+02	1.80E+02
0.01	1.81E+02	1.81E+02	1.81E+02	1.81E+02	1.80E+02	1.80E+02	1.80E+02
0.02	1.80E+02	1.80E+02	1.80E+02	1.80E+02	1.79E+02	1.79E+02	1.79E+02
0.04	1.79E+02	1.78E+02	1.78E+02	1.77E+02	1.76E+02	1.75E+02	1.75E+02
0.06	1.77E+02	1.75E+02	1.75E+02	1.73E+02	1.71E+02	1.69E+02	1.67E+02
0.10	1.71E+02	1.66E+02	1.65E+02	1.62E+02	1.58E+02	1.54E+02	1.51E+02
0.20	1.50E+02	1.40E+02	1.37E+02	1.32E+02	1.23E+02	1.17E+02	1.13E+02
0.30	1.29E+02	1.15E+02	1.12E+02	1.05E+02	9.44E+01	8.67E+01	8.18E+01
0.40	1.10E+02	9.39E+01	9.07E+01	8.27E+01	7.20E+01	6.45E+01	5.99E+01
0.50	9.32E+01	7.65E+01	7.33E+01	6.55E+01	5.55E+01	4.89E+01	4.50E+01
0.60	7.90E+01	6.26E+01	5.96E+01	5.24E+01	4.38E+01	3.83E+01	3.53E+01
0.70	6.71E+01	5.17E+01	4.89E+01	4.27E+01	3.55E+01	3.14E+01	2.93E+01
0.80	5.73E+01	4.33E+01	4.09E+01	3.55E+01	2.96E+01	2.64E+01	2.49E+01
1.00	4.30E+01	3.20E+01	3.02E+01	2.61E+01	2.17E+01	1.92E+01	1.79E+01
1.20	3.37E+01	2.51E+01	2.36E+01	2.04E+01	1.64E+01	1.36E+01	1.19E+01
1.50	2.48E+01	1.82E+01	1.70E+01	1.42E+01	1.05E+01	7.67E+00	5.92E+00
1.70	2.07E+01	1.46E+01	1.36E+01	1.10E+01	7.67E+00	5.33E+00	3.96E+00
2.00	1.58E+01	1.03E+01	9.36E+00	7.28E+00	4.88E+00	3.42E+00	2.63E+00
2.50	9.85E+00	5.60E+00	4.98E+00	3.76E+00	2.68E+00	2.25E+00	2.15E+00
3.00	6.16E+00	3.33E+00	2.97E+00	2.28E+00	1.80E+00	1.77E+00	1.97E+00
3.50	4.07E+00	2.32E+00	2.09E+00	1.67E+00	1.35E+00	1.28E+00	1.34E+00
4.00	2.91E+00	1.83E+00	1.68E+00	1.37E+00	1.04E+00	8.15E−01	6.75E−01
5.00	1.81E+00	1.25E+00	1.16E+00	9.32E−01	5.78E−01	3.13E−01	1.73E−01
6.00	1.26E+00	7.83E−01	7.05E−01	5.26E−01	3.01E−01	1.61E−01	9.32E−02
7.00	8.66E−01	4.54E−01	3.96E−01	2.79E−01	1.68E−01	1.14E−01	8.86E−02
8.00	5.83E−01	2.70E−01	2.31E−01	1.60E−01	1.08E−01	9.50E−02	9.88E−02
9.00	3.92E−01	1.74E−01	1.49E−01	1.06E−01	7.89E−02	8.12E−02	9.87E−02
10.00	2.70E−01	1.25E−01	1.08E−01	7.98E−02	6.28E−02	6.62E−02	8.02E−02
12.50	1.31E−01	7.59E−02	6.92E−02	5.57E−02	4.13E−02	3.13E−02	2.49E−02
15.00	8.15E−02	5.48E−02	5.10E−02	4.13E−02	2.59E−02	1.37E−02	7.25E−03
17.50	5.80E−02	3.79E−02	3.46E−02	2.64E−02	1.45E−02	6.66E−03	3.16E−03
20.00	4.27E−02	2.46E−02	2.17E−02	1.52E−02	7.60E−03	3.49E−03	1.76E−03
22.50	3.12E−02	1.54E−02	1.31E−02	8.41E−03	3.93E−03	1.88E−03	1.04E−03
25.00	2.22E−02	9.53E−03	7.85E−03	4.67E−03	2.06E−03	1.01E−03	6.07E−04
27.50	1.56E−02	5.90E−03	4.73E−03	2.65E−03	1.10E−03	5.44E−04	3.41E−04
30.00	1.08E−02	3.67E−03	2.89E−03	1.53E−03	6.07E−04	2.98E−04	1.89E−04
35.00	5.09E−03	1.47E−03	1.11E−03	5.48E−04	1.97E−04	9.18E−05	5.71E−05
40.00	2.42E−03	6.19E−04	4.61E−04	2.16E−04	7.33E−05	3.28E−05	2.00E−05
45.00	1.19E−03	2.80E−04	2.07E−04	9.52E−05	3.25E−05	1.50E−05	9.41E−06
50.00	6.10E−04	1.38E−04	1.01E−04	4.74E−05	1.72E−05	8.66E−06	5.88E−06
55.00	3.31E−04	7.45E−05	5.54E−05	2.71E−05	1.12E−05	6.61E−06	5.18E−06
60.00	1.93E−04	4.52E−05	3.43E−05	1.80E−05	8.68E−06	6.12E−06	5.54E−06
65.00	1.22E−04	3.04E−05	2.36E−05	1.33E−05	7.39E−06	5.98E−06	6.01E−06
70.00	8.38E−05	2.29E−05	1.82E−05	1.11E−05	6.91E−06	6.13E−06	6.51E−06
75.00	6.23E−05	1.88E−05	1.54E−05	1.00E−05	6.85E−06	6.38E−06	6.86E−06
80.00	4.97E−05	1.66E−05	1.39E−05	9.52E−06	6.95E−06	6.57E−06	6.96E−06
85.00	4.19E−05	1.53E−05	1.31E−05	9.44E−06	7.24E−06	6.86E−06	7.08E−06
90.00	3.72E−05	1.48E−05	1.28E−05	9.63E−06	7.66E−06	7.24E−06	7.27E−06
95.00	3.40E−05	1.45E−05	1.27E−05	9.90E−06	8.09E−06	7.58E−06	7.41E−06
105.00	3.08E−05	1.47E−05	1.32E−05	1.08E−05	9.17E−06	8.42E−06	7.83E−06
120.00	2.92E−05	1.57E−05	1.45E−05	1.25E−05	1.09E−05	9.79E−06	8.64E−06
135.00	2.95E−05	1.73E−05	1.62E−05	1.45E−05	1.29E−05	1.11E−05	9.29E−06
150.00	3.01E−05	1.87E−05	1.77E−05	1.61E−05	1.45E−05	1.23E−05	9.96E−06
165.00	3.08E−05	1.97E−05	1.88E−05	1.73E−05	1.57E−05	1.32E−05	1.05E−05
180.00	3.10E−05	2.01E−05	1.92E−05	1.78E−05	1.62E−05	1.35E−05	1.07E−05
total	3.34E−01	2.19E−01	2.02E−01	1.65E−01	1.25E−01	1.02E−01	9.09E−02
rel ff	3.44E−01	2.26E−01	2.08E−01	1.70E−01	1.29E−01	1.06E−01	9.38E−02
nrl ff	3.62E−01	2.37E−01	2.19E−01	1.79E−01	1.36E−01	1.12E−01	9.87E−02

TABLE 1. Predicted *S*-matrix differential elastic scattering cross sections for photon energies (50.0, 59.54, 145.4, 316.5, 411.8, 468.1, 661.6, 778.9, 964.0, 1004.8, 1112.1, 1274.5, 1408.0 and 1500.0). The angle integrated total cross sections for each element and energies are presented. ''total'' represents total cross sections from this work, ''rel ff'' represents total cross sections calculated from the relativistic form factor and ''nrl ff'' represents total cross sections calculated from the nonrelativistic form factor—Continued[a]

θ (deg)	Photon energy (keV)						
	50.0	59.5	145.4	316.5	411.8	468.1	661.6
Indium ($Z=49$)							
0.00	1.92E+02	1.92E+02	1.90E+02	1.89E+02	1.89E+02	1.89E+02	1.88E+02
0.01	1.92E+02	1.92E+02	1.90E+02	1.89E+02	1.89E+02	1.88E+02	1.88E+02
0.02	1.92E+02	1.92E+02	1.90E+02	1.89E+02	1.88E+02	1.88E+02	1.88E+02
0.04	1.92E+02	1.92E+02	1.90E+02	1.89E+02	1.88E+02	1.88E+02	1.87E+02
0.06	1.92E+02	1.92E+02	1.90E+02	1.88E+02	1.87E+02	1.87E+02	1.85E+02
0.10	1.92E+02	1.92E+02	1.89E+02	1.87E+02	1.85E+02	1.84E+02	1.81E+02
0.20	1.92E+02	1.91E+02	1.88E+02	1.82E+02	1.77E+02	1.74E+02	1.63E+02
0.30	1.92E+02	1.91E+02	1.86E+02	1.74E+02	1.66E+02	1.61E+02	1.44E+02
0.40	1.91E+02	1.91E+02	1.84E+02	1.65E+02	1.54E+02	1.48E+02	1.27E+02
0.50	1.91E+02	1.90E+02	1.81E+02	1.56E+02	1.42E+02	1.35E+02	1.10E+02
0.60	1.90E+02	1.89E+02	1.77E+02	1.47E+02	1.31E+02	1.23E+02	9.61E+01
0.70	1.90E+02	1.88E+02	1.73E+02	1.38E+02	1.21E+02	1.11E+02	8.36E+01
0.80	1.89E+02	1.87E+02	1.69E+02	1.30E+02	1.11E+02	1.01E+02	7.27E+01
1.00	1.88E+02	1.85E+02	1.60E+02	1.14E+02	9.33E+01	8.28E+01	5.56E+01
1.20	1.86E+02	1.83E+02	1.52E+02	9.98E+01	7.84E+01	6.81E+01	4.37E+01
1.50	1.83E+02	1.78E+02	1.40E+02	8.17E+01	6.07E+01	5.18E+01	3.23E+01
1.70	1.80E+02	1.75E+02	1.32E+02	7.16E+01	5.18E+01	4.39E+01	2.73E+01
2.00	1.76E+02	1.70E+02	1.21E+02	5.91E+01	4.17E+01	3.51E+01	2.18E+01
2.50	1.69E+02	1.61E+02	1.04E+02	4.43E+01	3.08E+01	2.57E+01	1.51E+01
3.00	1.62E+02	1.52E+02	8.89E+01	3.45E+01	2.41E+01	1.97E+01	1.01E+01
3.50	1.55E+02	1.44E+02	7.63E+01	2.79E+01	1.92E+01	1.51E+01	6.74E+00
4.00	1.49E+02	1.36E+02	6.56E+01	2.30E+01	1.53E+01	1.16E+01	4.62E+00
5.00	1.36E+02	1.20E+02	4.95E+01	1.61E+01	9.26E+00	6.74E+00	2.64E+00
6.00	1.23E+02	1.06E+02	3.87E+01	1.12E+01	5.62E+00	4.09E+00	1.86E+00
7.00	1.09E+02	9.37E+01	3.14E+01	7.73E+00	3.68E+00	2.72E+00	1.40E+00
8.00	9.59E+01	8.25E+01	2.62E+01	5.44E+00	2.67E+00	2.00E+00	1.03E+00
9.00	8.42E+01	7.28E+01	2.23E+01	3.96E+00	2.11E+00	1.58E+00	7.33E−01
10.00	7.41E+01	6.43E+01	1.90E+01	3.00E+00	1.74E+00	1.29E+00	5.15E−01
12.50	5.65E+01	4.82E+01	1.24E+01	1.79E+00	1.10E+00	7.66E−01	2.29E−01
15.00	4.61E+01	3.75E+01	7.93E+00	1.23E+00	6.48E−01	4.33E−01	1.28E−01
17.50	3.93E+01	3.03E+01	5.14E+00	8.59E−01	3.76E−01	2.49E−01	8.78E−02
20.00	3.39E+01	2.51E+01	3.55E+00	5.88E−01	2.30E−01	1.55E−01	6.62E−02
22.50	2.89E+01	2.11E+01	2.65E+00	4.00E−01	1.54E−01	1.06E−01	5.11E−02
25.00	2.43E+01	1.77E+01	2.12E+00	2.76E−01	1.13E−01	7.98E−02	3.92E−02
27.50	2.01E+01	1.48E+01	1.76E+00	1.96E−01	8.86E−02	6.36E−02	2.96E−02
30.00	1.65E+01	1.23E+01	1.48E+00	1.45E−01	7.26E−02	5.24E−02	2.21E−02
35.00	1.10E+01	8.38E+00	1.04E+00	8.88E−02	5.11E−02	3.64E−02	1.19E−02
40.00	7.44E+00	5.70E+00	7.11E−01	6.14E−02	3.61E−02	2.47E−02	6.35E−03
45.00	5.28E+00	3.98E+00	4.75E−01	4.54E−02	2.51E−02	1.63E−02	3.41E−03
50.00	3.96E+00	2.90E+00	3.19E−01	3.46E−02	1.72E−02	1.06E−02	1.88E−03
55.00	3.13E+00	2.22E+00	2.19E−01	2.65E−02	1.18E−02	6.90E−03	1.07E−03
60.00	2.58E+00	1.78E+00	1.57E−01	2.04E−02	8.09E−03	4.54E−03	6.37E−04
65.00	2.19E+00	1.47E+00	1.18E−01	1.57E−02	5.65E−03	3.05E−03	4.01E−04
70.00	1.89E+00	1.25E+00	9.30E−02	1.22E−02	4.04E−03	2.12E−03	2.69E−04
75.00	1.66E+00	1.08E+00	7.67E−02	9.66E−03	2.98E−03	1.53E−03	1.92E−04
80.00	1.47E+00	9.58E−01	6.59E−02	7.79E−03	2.28E−03	1.15E−03	1.47E−04
85.00	1.32E+00	8.60E−01	5.87E−02	6.43E−03	1.80E−03	9.05E−04	1.18E−04
90.00	1.20E+00	7.86E−01	5.39E−02	5.45E−03	1.48E−03	7.40E−04	1.00E−04
95.00	1.10E+00	7.29E−01	5.08E−02	4.73E−03	1.26E−03	6.27E−04	8.84E−05
105.00	9.80E−01	6.59E−01	4.80E−02	3.81E−03	9.83E−04	4.90E−04	7.46E−05
120.00	8.99E−01	6.19E−01	4.83E−02	3.12E−03	7.82E−04	3.92E−04	6.55E−05
135.00	8.80E−01	6.18E−01	5.07E−02	2.77E−03	6.85E−04	3.45E−04	6.20E−05
150.00	8.85E−01	6.29E−01	5.31E−02	2.59E−03	6.34E−04	3.21E−04	6.08E−05
165.00	8.94E−01	6.39E−01	5.48E−02	2.49E−03	6.08E−04	3.09E−04	6.05E−05
180.00	8.97E−01	6.43E−01	5.53E−02	2.46E−03	6.00E−04	3.05E−04	6.05E−05
total	6.05E+01	4.67E+01	9.27E+00	2.08E+00	1.25E+00	9.68E−01	4.89E−01
rel ff	5.84E+01	4.38E+01	9.08E+00	2.10E+00	1.27E+00	9.90E−01	5.02E−01
nrl ff	6.00E+01	4.51E+01	9.46E+00	2.21E+00	1.33E+00	1.04E+00	5.28E−01

TABLE 1. Predicted *S*-matrix differential elastic scattering cross sections for photon energies (50.0, 59.54, 145.4, 316.5, 411.8, 468.1, 661.6, 778.9, 964.0, 1004.8, 1112.1, 1274.5, 1408.0 and 1500.0). The angle integrated total cross sections for each element and energies are presented. ''total'' represents total cross sections from this work, ''rel ff'' represents total cross sections calculated from the relativistic form factor and ''nrl ff'' represents total cross sections calculated from the nonrelativistic form factor—Continued[a]

θ (deg)	Photon energy (keV)						
	778.9	964.0	1004.8	1112.1	1274.5	1408.0	1500.0
Indium ($Z=49$)							
0.00	1.88E+02	1.88E+02	1.88E+02	1.88E+02	1.88E+02	1.88E+02	1.88E+02
0.01	1.88E+02	1.88E+02	1.88E+02	1.88E+02	1.88E+02	1.88E+02	1.87E+02
0.02	1.88E+02	1.88E+02	1.88E+02	1.87E+02	1.87E+02	1.87E+02	1.86E+02
0.04	1.87E+02	1.85E+02	1.85E+02	1.85E+02	1.83E+02	1.82E+02	1.82E+02
0.06	1.84E+02	1.82E+02	1.82E+02	1.80E+02	1.78E+02	1.76E+02	1.74E+02
0.10	1.78E+02	1.73E+02	1.72E+02	1.69E+02	1.64E+02	1.60E+02	1.58E+02
0.20	1.56E+02	1.46E+02	1.43E+02	1.37E+02	1.29E+02	1.22E+02	1.18E+02
0.30	1.35E+02	1.20E+02	1.17E+02	1.10E+02	9.88E+01	9.08E+01	8.56E+01
0.40	1.15E+02	9.83E+01	9.49E+01	8.66E+01	7.54E+01	6.75E+01	6.26E+01
0.50	9.76E+01	8.01E+01	7.67E+01	6.86E+01	5.81E+01	5.11E+01	4.69E+01
0.60	8.27E+01	6.55E+01	6.23E+01	5.48E+01	4.57E+01	4.00E+01	3.68E+01
0.70	7.03E+01	5.41E+01	5.12E+01	4.46E+01	3.70E+01	3.27E+01	3.05E+01
0.80	6.00E+01	4.52E+01	4.27E+01	3.70E+01	3.09E+01	2.75E+01	2.59E+01
1.00	4.49E+01	3.33E+01	3.14E+01	2.72E+01	2.27E+01	2.02E+01	1.90E+01
1.20	3.51E+01	2.62E+01	2.47E+01	2.13E+01	1.72E+01	1.45E+01	1.28E+01
1.50	2.59E+01	1.91E+01	1.79E+01	1.51E+01	1.12E+01	8.26E+00	6.41E+00
1.70	2.17E+01	1.55E+01	1.44E+01	1.18E+01	8.24E+00	5.72E+00	4.23E+00
2.00	1.67E+01	1.10E+01	1.01E+01	7.85E+00	5.25E+00	3.62E+00	2.73E+00
2.50	1.05E+01	6.03E+00	5.37E+00	4.04E+00	2.84E+00	2.33E+00	2.17E+00
3.00	6.61E+00	3.55E+00	3.15E+00	2.41E+00	1.88E+00	1.85E+00	2.06E+00
3.50	4.35E+00	2.43E+00	2.18E+00	1.73E+00	1.40E+00	1.37E+00	1.47E+00
4.00	3.09E+00	1.90E+00	1.74E+00	1.42E+00	1.09E+00	8.88E−01	7.68E−01
5.00	1.90E+00	1.32E+00	1.22E+00	9.86E−01	6.21E−01	3.41E−01	1.92E−01
6.00	1.32E+00	8.39E−01	7.59E−01	5.71E−01	3.27E−01	1.71E−01	9.61E−02
7.00	9.20E−01	4.93E−01	4.32E−01	3.05E−01	1.82E−01	1.18E−01	8.73E−02
8.00	6.26E−01	2.93E−01	2.52E−01	1.74E−01	1.15E−01	9.73E−02	9.71E−02
9.00	4.23E−01	1.88E−01	1.60E−01	1.13E−01	8.28E−02	8.37E−02	1.00E−01
10.00	2.92E−01	1.32E−01	1.14E−01	8.35E−02	6.53E−02	6.93E−02	8.52E−02
12.50	1.39E−01	7.87E−02	7.14E−02	5.71E−02	4.28E−02	3.39E−02	2.83E−02
15.00	8.54E−02	5.70E−02	5.29E−02	4.30E−02	2.74E−02	1.49E−02	8.17E−03
17.50	6.05E−02	3.99E−02	3.66E−02	2.82E−02	1.57E−02	7.29E−03	3.46E−03
20.00	4.47E−02	2.63E−02	2.33E−02	1.65E−02	8.39E−03	3.83E−03	1.90E−03
22.50	3.29E−02	1.67E−02	1.43E−02	9.30E−03	4.39E−03	2.08E−03	1.13E−03
25.00	2.37E−02	1.04E−02	8.65E−03	5.22E−03	2.32E−03	1.13E−03	6.68E−04
27.50	1.68E−02	6.51E−03	5.26E−03	2.98E−03	1.25E−03	6.15E−04	3.80E−04
30.00	1.17E−02	4.09E−03	3.23E−03	1.73E−03	6.91E−04	3.38E−04	2.14E−04
35.00	5.61E−03	1.65E−03	1.26E−03	6.23E−04	2.26E−04	1.05E−04	6.54E−05
40.00	2.70E−03	7.02E−04	5.23E−04	2.46E−04	8.38E−05	3.76E−05	2.28E−05
45.00	1.34E−03	3.19E−04	2.35E−04	1.08E−04	3.69E−05	1.69E−05	1.06E−05
50.00	6.90E−04	1.57E−04	1.16E−04	5.38E−05	1.94E−05	9.64E−06	6.49E−06
55.00	3.76E−04	8.47E−05	6.29E−05	3.06E−05	1.25E−05	7.27E−06	5.63E−06
60.00	2.20E−04	5.13E−05	3.88E−05	2.02E−05	9.59E−06	6.65E−06	5.96E−06
65.00	1.39E−04	3.44E−05	2.66E−05	1.49E−05	8.12E−06	6.47E−06	6.45E−06
70.00	9.54E−05	2.58E−05	2.05E−05	1.23E−05	7.55E−06	6.62E−06	6.99E−06
75.00	7.09E−05	2.12E−05	1.72E−05	1.10E−05	7.44E−06	6.86E−06	7.37E−06
80.00	5.65E−05	1.86E−05	1.54E−05	1.05E−05	7.52E−06	7.06E−06	7.48E−06
85.00	4.76E−05	1.71E−05	1.45E−05	1.03E−05	7.81E−06	7.37E−06	7.63E−06
90.00	4.22E−05	1.64E−05	1.42E−05	1.05E−05	8.24E−06	7.77E−06	7.84E−06
95.00	3.86E−05	1.60E−05	1.40E−05	1.08E−05	8.68E−06	8.13E−06	8.00E−06
105.00	3.47E−05	1.62E−05	1.45E−05	1.17E−05	9.80E−06	9.01E−06	8.47E−06
120.00	3.28E−05	1.72E−05	1.57E−05	1.34E−05	1.16E−05	1.05E−05	9.34E−06
135.00	3.29E−05	1.88E−05	1.75E−05	1.54E−05	1.36E−05	1.19E−05	1.00E−05
150.00	3.34E−05	2.02E−05	1.91E−05	1.72E−05	1.53E−05	1.31E−05	1.07E−05
165.00	3.40E−05	2.13E−05	2.02E−05	1.84E−05	1.66E−05	1.40E−05	1.13E−05
180.00	3.43E−05	2.17E−05	2.06E−05	1.89E−05	1.70E−05	1.44E−05	1.15E−05
total	3.52E−01	2.31E−01	2.13E−01	1.74E−01	1.32E−01	1.07E−01	9.61E−02
rel ff	3.64E−01	2.39E−01	2.20E−01	1.79E−01	1.36E−01	1.12E−01	9.91E−02
nrl ff	3.83E−01	2.51E−01	2.32E−01	1.89E−01	1.44E−01	1.18E−01	1.05E−01

TABLE 1. Predicted *S*-matrix differential elastic scattering cross sections for photon energies (50.0, 59.54, 145.4, 316.5, 411.8, 468.1, 661.6, 778.9, 964.0, 1004.8, 1112.1, 1274.5, 1408.0 and 1500.0). The angle integrated total cross sections for each element and energies are presented. ''total'' represents total cross sections from this work, ''rel ff'' represents total cross sections calculated from the relativistic form factor and ''nrl ff'' represents total cross sections calculated from the nonrelativistic form factor—Continued[a]

θ (deg)	Photon energy (keV)						
	50.0	59.5	145.4	316.5	411.8	468.1	661.6
Tin ($Z=50$)							
0.00	2.00E+02	1.99E+02	1.98E+02	1.97E+02	1.96E+02	1.96E+02	1.96E+02
0.01	2.00E+02	1.99E+02	1.98E+02	1.96E+02	1.96E+02	1.96E+02	1.96E+02
0.02	2.00E+02	1.99E+02	1.97E+02	1.96E+02	1.96E+02	1.96E+02	1.96E+02
0.04	2.00E+02	1.99E+02	1.97E+02	1.96E+02	1.96E+02	1.96E+02	1.95E+02
0.06	2.00E+02	1.99E+02	1.97E+02	1.96E+02	1.95E+02	1.95E+02	1.93E+02
0.10	2.00E+02	1.99E+02	1.97E+02	1.95E+02	1.93E+02	1.92E+02	1.88E+02
0.20	1.99E+02	1.99E+02	1.96E+02	1.89E+02	1.84E+02	1.81E+02	1.70E+02
0.30	1.99E+02	1.99E+02	1.94E+02	1.81E+02	1.73E+02	1.68E+02	1.51E+02
0.40	1.99E+02	1.98E+02	1.91E+02	1.72E+02	1.61E+02	1.54E+02	1.32E+02
0.50	1.99E+02	1.98E+02	1.88E+02	1.63E+02	1.49E+02	1.41E+02	1.15E+02
0.60	1.98E+02	1.97E+02	1.84E+02	1.53E+02	1.37E+02	1.28E+02	1.00E+02
0.70	1.97E+02	1.96E+02	1.80E+02	1.44E+02	1.26E+02	1.16E+02	8.74E+01
0.80	1.97E+02	1.95E+02	1.76E+02	1.36E+02	1.16E+02	1.05E+02	7.60E+01
1.00	1.95E+02	1.93E+02	1.67E+02	1.19E+02	9.75E+01	8.66E+01	5.82E+01
1.20	1.93E+02	1.90E+02	1.58E+02	1.04E+02	8.20E+01	7.13E+01	4.56E+01
1.50	1.90E+02	1.85E+02	1.46E+02	8.54E+01	6.35E+01	5.41E+01	3.37E+01
1.70	1.87E+02	1.82E+02	1.38E+02	7.48E+01	5.41E+01	4.58E+01	2.85E+01
2.00	1.83E+02	1.77E+02	1.26E+02	6.18E+01	4.35E+01	3.66E+01	2.28E+01
2.50	1.76E+02	1.68E+02	1.08E+02	4.62E+01	3.21E+01	2.69E+01	1.60E+01
3.00	1.68E+02	1.59E+02	9.30E+01	3.60E+01	2.52E+01	2.06E+01	1.08E+01
3.50	1.61E+02	1.50E+02	7.98E+01	2.91E+01	2.02E+01	1.60E+01	7.23E+00
4.00	1.55E+02	1.42E+02	6.86E+01	2.41E+01	1.61E+01	1.23E+01	4.95E+00
5.00	1.42E+02	1.26E+02	5.17E+01	1.69E+01	9.91E+00	7.22E+00	2.78E+00
6.00	1.28E+02	1.11E+02	4.04E+01	1.19E+01	6.03E+00	4.38E+00	1.94E+00
7.00	1.14E+02	9.79E+01	3.28E+01	8.25E+00	3.91E+00	2.88E+00	1.46E+00
8.00	1.00E+02	8.62E+01	2.74E+01	5.82E+00	2.81E+00	2.10E+00	1.09E+00
9.00	8.81E+01	7.61E+01	2.33E+01	4.22E+00	2.21E+00	1.65E+00	7.83E−01
10.00	7.74E+01	6.72E+01	1.99E+01	3.19E+00	1.82E+00	1.35E+00	5.55E−01
12.50	5.87E+01	5.03E+01	1.32E+01	1.89E+00	1.16E+00	8.13E−01	2.47E−01
15.00	4.77E+01	3.91E+01	8.50E+00	1.29E+00	6.95E−01	4.66E−01	1.36E−01
17.50	4.06E+01	3.15E+01	5.51E+00	9.09E−01	4.06E−01	2.69E−01	9.18E−02
20.00	3.51E+01	2.61E+01	3.78E+00	6.28E−01	2.48E−01	1.66E−01	6.89E−02
22.50	3.02E+01	2.20E+01	2.80E+00	4.30E−01	1.65E−01	1.13E−01	5.33E−02
25.00	2.55E+01	1.86E+01	2.22E+00	2.97E−01	1.19E−01	8.39E−02	4.11E−02
27.50	2.13E+01	1.56E+01	1.84E+00	2.11E−01	9.30E−02	6.64E−02	3.13E−02
30.00	1.75E+01	1.30E+01	1.55E+00	1.55E−01	7.57E−02	5.46E−02	2.35E−02
35.00	1.17E+01	8.93E+00	1.10E+00	9.40E−02	5.33E−02	3.80E−02	1.29E−02
40.00	7.95E+00	6.09E+00	7.59E−01	6.44E−02	3.79E−02	2.61E−02	6.96E−03
45.00	5.62E+00	4.24E+00	5.11E−01	4.75E−02	2.66E−02	1.75E−02	3.78E−03
50.00	4.18E+00	3.08E+00	3.45E−01	3.62E−02	1.84E−02	1.15E−02	2.09E−03
55.00	3.27E+00	2.34E+00	2.37E−01	2.78E−02	1.27E−02	7.53E−03	1.20E−03
60.00	2.68E+00	1.86E+00	1.70E−01	2.15E−02	8.79E−03	4.99E−03	7.19E−04
65.00	2.27E+00	1.54E+00	1.27E−01	1.67E−02	6.19E−03	3.38E−03	4.54E−04
70.00	1.96E+00	1.30E+00	9.93E−02	1.31E−02	4.46E−03	2.36E−03	3.06E−04
75.00	1.72E+00	1.13E+00	8.15E−02	1.04E−02	3.31E−03	1.71E−03	2.19E−04
80.00	1.53E+00	9.99E−01	6.97E−02	8.45E−03	2.54E−03	1.30E−03	1.67E−04
85.00	1.38E+00	8.99E−01	6.19E−02	7.02E−03	2.02E−03	1.02E−03	1.35E−04
90.00	1.26E+00	8.24E−01	5.67E−02	5.98E−03	1.66E−03	8.37E−04	1.14E−04
95.00	1.16E+00	7.67E−01	5.34E−02	5.21E−03	1.42E−03	7.12E−04	1.01E−04
105.00	1.04E+00	6.97E−01	5.05E−02	4.23E−03	1.11E−03	5.58E−04	8.48E−05
120.00	9.63E−01	6.60E−01	5.09E−02	3.49E−03	8.89E−04	4.48E−04	7.42E−05
135.00	9.49E−01	6.62E−01	5.35E−02	3.12E−03	7.81E−04	3.95E−04	7.00E−05
150.00	9.56E−01	6.75E−01	5.62E−02	2.92E−03	7.23E−04	3.67E−04	6.84E−05
165.00	9.66E−01	6.87E−01	5.80E−02	2.81E−03	6.93E−04	3.53E−04	6.80E−05
180.00	9.71E−01	6.91E−01	5.86E−02	2.78E−03	6.84E−04	3.49E−04	6.79E−05
total	6.36E+01	4.90E+01	9.78E+00	2.20E+00	1.32E+00	1.02E+00	5.16E−01
rel ff	6.13E+01	4.60E+01	9.56E+00	2.22E+00	1.34E+00	1.04E+00	5.29E−01
nrl ff	6.30E+01	4.75E+01	9.98E+00	2.33E+00	1.41E+00	1.10E+00	5.59E−01

TABLE 1. Predicted *S*-matrix differential elastic scattering cross sections for photon energies (50.0, 59.54, 145.4, 316.5, 411.8, 468.1, 661.6, 778.9, 964.0, 1004.8, 1112.1, 1274.5, 1408.0 and 1500.0). The angle integrated total cross sections for each element and energies are presented. ''total'' represents total cross sections from this work, ''rel ff'' represents total cross sections calculated from the relativistic form factor and ''nrl ff'' represents total cross sections calculated from the nonrelativistic form factor—Continued[a]

θ (deg)	Photon energy (keV)						
	778.9	964.0	1004.8	1112.1	1274.5	1408.0	1500.0
Tin ($Z=50$)							
0.00	1.96E+02	1.96E+02	1.96E+02	1.96E+02	1.96E+02	1.96E+02	1.96E+02
0.01	1.96E+02	1.96E+02	1.96E+02	1.96E+02	1.96E+02	1.95E+02	1.95E+02
0.02	1.96E+02	1.95E+02	1.95E+02	1.95E+02	1.95E+02	1.94E+02	1.94E+02
0.04	1.94E+02	1.93E+02	1.93E+02	1.92E+02	1.91E+02	1.90E+02	1.89E+02
0.06	1.92E+02	1.90E+02	1.89E+02	1.88E+02	1.85E+02	1.83E+02	1.81E+02
0.10	1.85E+02	1.80E+02	1.79E+02	1.76E+02	1.71E+02	1.67E+02	1.64E+02
0.20	1.63E+02	1.52E+02	1.50E+02	1.43E+02	1.34E+02	1.28E+02	1.23E+02
0.30	1.41E+02	1.26E+02	1.22E+02	1.14E+02	1.03E+02	9.49E+01	8.95E+01
0.40	1.20E+02	1.03E+02	9.92E+01	9.05E+01	7.89E+01	7.06E+01	6.55E+01
0.50	1.02E+02	8.38E+01	8.02E+01	7.17E+01	6.07E+01	5.34E+01	4.90E+01
0.60	8.65E+01	6.85E+01	6.52E+01	5.73E+01	4.78E+01	4.17E+01	3.84E+01
0.70	7.35E+01	5.65E+01	5.35E+01	4.66E+01	3.86E+01	3.40E+01	3.17E+01
0.80	6.27E+01	4.72E+01	4.46E+01	3.87E+01	3.22E+01	2.87E+01	2.70E+01
1.00	4.69E+01	3.48E+01	3.28E+01	2.84E+01	2.37E+01	2.12E+01	2.00E+01
1.20	3.66E+01	2.73E+01	2.57E+01	2.22E+01	1.81E+01	1.54E+01	1.37E+01
1.50	2.70E+01	2.01E+01	1.88E+01	1.59E+01	1.19E+01	8.87E+00	6.93E+00
1.70	2.27E+01	1.64E+01	1.52E+01	1.25E+01	8.82E+00	6.14E+00	4.54E+00
2.00	1.75E+01	1.18E+01	1.07E+01	8.43E+00	5.63E+00	3.84E+00	2.85E+00
2.50	1.12E+01	6.48E+00	5.78E+00	4.34E+00	3.01E+00	2.42E+00	2.19E+00
3.00	7.07E+00	3.79E+00	3.35E+00	2.55E+00	1.97E+00	1.92E+00	2.12E+00
3.50	4.64E+00	2.55E+00	2.29E+00	1.80E+00	1.46E+00	1.45E+00	1.60E+00
4.00	3.27E+00	1.98E+00	1.81E+00	1.47E+00	1.14E+00	9.61E−01	8.65E−01
5.00	1.99E+00	1.38E+00	1.28E+00	1.04E+00	6.63E−01	3.73E−01	2.15E−01
6.00	1.38E+00	8.94E−01	8.13E−01	6.16E−01	3.54E−01	1.83E−01	1.01E−01
7.00	9.74E−01	5.34E−01	4.69E−01	3.34E−01	1.96E−01	1.23E−01	8.65E−02
8.00	6.69E−01	3.19E−01	2.74E−01	1.89E−01	1.23E−01	9.98E−02	9.53E−02
9.00	4.55E−01	2.02E−01	1.73E−01	1.21E−01	8.71E−02	8.60E−02	1.01E−01
10.00	3.14E−01	1.41E−01	1.21E−01	8.78E−02	6.80E−02	7.21E−02	8.92E−02
12.50	1.48E−01	8.17E−02	7.38E−02	5.85E−02	4.44E−02	3.65E−02	3.19E−02
15.00	8.96E−02	5.90E−02	5.48E−02	4.46E−02	2.90E−02	1.63E−02	9.23E−03
17.50	6.31E−02	4.19E−02	3.85E−02	3.00E−02	1.70E−02	7.96E−03	3.81E−03
20.00	4.67E−02	2.80E−02	2.50E−02	1.79E−02	9.22E−03	4.20E−03	2.06E−03
22.50	3.46E−02	1.80E−02	1.55E−02	1.02E−02	4.89E−03	2.29E−03	1.23E−03
25.00	2.52E−02	1.14E−02	9.50E−03	5.81E−03	2.60E−03	1.26E−03	7.31E−04
27.50	1.80E−02	7.17E−03	5.82E−03	3.33E−03	1.41E−03	6.91E−04	4.22E−04
30.00	1.27E−02	4.53E−03	3.59E−03	1.95E−03	7.85E−04	3.83E−04	2.40E−04
35.00	6.17E−03	1.85E−03	1.42E−03	7.07E−04	2.58E−04	1.20E−04	7.46E−05
40.00	3.01E−03	7.92E−04	5.93E−04	2.80E−04	9.57E−05	4.29E−05	2.61E−05
45.00	1.50E−03	3.62E−04	2.67E−04	1.23E−04	4.19E−05	1.91E−05	1.19E−05
50.00	7.79E−04	1.78E−04	1.31E−04	6.11E−05	2.18E−05	1.07E−05	7.18E−06
55.00	4.26E−04	9.62E−05	7.14E−05	3.46E−05	1.39E−05	8.00E−06	6.13E−06
60.00	2.50E−04	5.82E−05	4.39E−05	2.27E−05	1.06E−05	7.25E−06	6.43E−06
65.00	1.58E−04	3.89E−05	3.00E−05	1.66E−05	8.92E−06	7.02E−06	6.94E−06
70.00	1.08E−04	2.91E−05	2.30E−05	1.36E−05	8.25E−06	7.15E−06	7.52E−06
75.00	8.05E−05	2.37E−05	1.92E−05	1.22E−05	8.09E−06	7.40E−06	7.92E−06
80.00	6.42E−05	2.08E−05	1.72E−05	1.15E−05	8.15E−06	7.60E−06	8.05E−06
85.00	5.40E−05	1.91E−05	1.61E−05	1.13E−05	8.43E−06	7.92E−06	8.21E−06
90.00	4.78E−05	1.82E−05	1.57E−05	1.15E−05	8.88E−06	8.34E−06	8.45E−06
95.00	4.36E−05	1.78E−05	1.55E−05	1.17E−05	9.33E−06	8.71E−06	8.63E−06
105.00	3.91E−05	1.78E−05	1.59E−05	1.26E−05	1.05E−05	9.64E−06	9.14E−06
120.00	3.67E−05	1.88E−05	1.71E−05	1.44E−05	1.24E−05	1.12E−05	1.01E−05
135.00	3.66E−05	2.04E−05	1.90E−05	1.65E−05	1.45E−05	1.26E−05	1.08E−05
150.00	3.71E−05	2.19E−05	2.05E−05	1.83E−05	1.62E−05	1.39E−05	1.16E−05
165.00	3.77E−05	2.30E−05	2.17E−05	1.96E−05	1.75E−05	1.49E−05	1.22E−05
180.00	3.79E−05	2.34E−05	2.21E−05	2.00E−05	1.80E−05	1.53E−05	1.24E−05
total	3.72E−01	2.44E−01	2.25E−01	1.84E−01	1.39E−01	1.13E−01	1.01E−01
rel ff	3.84E−01	2.52E−01	2.32E−01	1.89E−01	1.44E−01	1.18E−01	1.05E−01
nrl ff	4.05E−01	2.66E−01	2.45E−01	2.00E−01	1.52E−01	1.25E−01	1.11E−01

TABLE 1. Predicted *S*-matrix differential elastic scattering cross sections for photon energies (50.0, 59.54, 145.4, 316.5, 411.8, 468.1, 661.6, 778.9, 964.0, 1004.8, 1112.1, 1274.5, 1408.0 and 1500.0). The angle integrated total cross sections for each element and energies are presented. ''total'' represents total cross sections from this work, ''rel ff'' represents total cross sections calculated from the relativistic form factor and ''nrl ff'' represents total cross sections calculated from the nonrelativistic form factor—Continued[a]

θ (deg)	Photon energy (keV)						
	50.0	59.5	145.4	316.5	411.8	468.1	661.6
Antimony ($Z=51$)							
0.00	2.08E+02	2.07E+02	2.06E+02	2.04E+02	2.04E+02	2.04E+02	2.04E+02
0.01	2.08E+02	2.07E+02	2.06E+02	2.04E+02	2.04E+02	2.04E+02	2.04E+02
0.02	2.08E+02	2.07E+02	2.05E+02	2.04E+02	2.04E+02	2.04E+02	2.04E+02
0.04	2.08E+02	2.07E+02	2.05E+02	2.04E+02	2.04E+02	2.04E+02	2.03E+02
0.06	2.08E+02	2.07E+02	2.05E+02	2.04E+02	2.03E+02	2.02E+02	2.01E+02
0.10	2.08E+02	2.07E+02	2.05E+02	2.02E+02	2.01E+02	1.99E+02	1.95E+02
0.20	2.07E+02	2.07E+02	2.04E+02	1.96E+02	1.91E+02	1.88E+02	1.76E+02
0.30	2.07E+02	2.07E+02	2.01E+02	1.88E+02	1.79E+02	1.74E+02	1.56E+02
0.40	2.07E+02	2.06E+02	1.98E+02	1.78E+02	1.67E+02	1.60E+02	1.37E+02
0.50	2.06E+02	2.05E+02	1.95E+02	1.69E+02	1.54E+02	1.46E+02	1.20E+02
0.60	2.06E+02	2.05E+02	1.91E+02	1.59E+02	1.42E+02	1.33E+02	1.04E+02
0.70	2.05E+02	2.04E+02	1.87E+02	1.50E+02	1.31E+02	1.21E+02	9.07E+01
0.80	2.04E+02	2.02E+02	1.83E+02	1.41E+02	1.20E+02	1.09E+02	7.90E+01
1.00	2.03E+02	2.00E+02	1.73E+02	1.24E+02	1.01E+02	8.99E+01	6.07E+01
1.20	2.01E+02	1.97E+02	1.64E+02	1.08E+02	8.51E+01	7.41E+01	4.77E+01
1.50	1.97E+02	1.92E+02	1.51E+02	8.87E+01	6.62E+01	5.65E+01	3.52E+01
1.70	1.94E+02	1.89E+02	1.43E+02	7.78E+01	5.65E+01	4.79E+01	2.96E+01
2.00	1.90E+02	1.83E+02	1.31E+02	6.44E+01	4.55E+01	3.83E+01	2.36E+01
2.50	1.82E+02	1.74E+02	1.13E+02	4.83E+01	3.35E+01	2.80E+01	1.66E+01
3.00	1.75E+02	1.65E+02	9.65E+01	3.76E+01	2.61E+01	2.14E+01	1.15E+01
3.50	1.68E+02	1.56E+02	8.29E+01	3.03E+01	2.08E+01	1.66E+01	7.80E+00
4.00	1.61E+02	1.47E+02	7.14E+01	2.50E+01	1.67E+01	1.29E+01	5.39E+00
5.00	1.47E+02	1.30E+02	5.41E+01	1.76E+01	1.05E+01	7.73E+00	2.98E+00
6.00	1.33E+02	1.15E+02	4.23E+01	1.25E+01	6.55E+00	4.75E+00	2.02E+00
7.00	1.18E+02	1.01E+02	3.42E+01	8.80E+00	4.26E+00	3.12E+00	1.50E+00
8.00	1.04E+02	8.94E+01	2.84E+01	6.27E+00	3.02E+00	2.24E+00	1.13E+00
9.00	9.19E+01	7.90E+01	2.41E+01	4.57E+00	2.32E+00	1.73E+00	8.31E−01
10.00	8.10E+01	6.99E+01	2.06E+01	3.45E+00	1.88E+00	1.39E+00	5.98E−01
12.50	6.14E+01	5.26E+01	1.39E+01	1.99E+00	1.20E+00	8.49E−01	2.69E−01
15.00	4.95E+01	4.08E+01	9.11E+00	1.34E+00	7.42E−01	5.00E−01	1.45E−01
17.50	4.18E+01	3.28E+01	6.00E+00	9.47E−01	4.42E−01	2.93E−01	9.58E−02
20.00	3.60E+01	2.71E+01	4.12E+00	6.64E−01	2.71E−01	1.81E−01	7.10E−02
22.50	3.09E+01	2.27E+01	3.01E+00	4.61E−01	1.78E−01	1.21E−01	5.49E−02
25.00	2.63E+01	1.92E+01	2.35E+00	3.22E−01	1.27E−01	8.87E−02	4.27E−02
27.50	2.21E+01	1.62E+01	1.91E+00	2.29E−01	9.75E−02	6.92E−02	3.28E−02
30.00	1.84E+01	1.36E+01	1.60E+00	1.68E−01	7.85E−02	5.63E−02	2.49E−02
35.00	1.26E+01	9.51E+00	1.14E+00	1.00E−01	5.49E−02	3.92E−02	1.39E−02
40.00	8.64E+00	6.58E+00	8.01E−01	6.76E−02	3.93E−02	2.73E−02	7.62E−03
45.00	6.12E+00	4.62E+00	5.50E−01	4.93E−02	2.79E−02	1.85E−02	4.18E−03
50.00	4.53E+00	3.35E+00	3.75E−01	3.74E−02	1.95E−02	1.23E−02	2.33E−03
55.00	3.51E+00	2.53E+00	2.60E−01	2.89E−02	1.36E−02	8.19E−03	1.35E−03
60.00	2.84E+00	1.99E+00	1.85E−01	2.25E−02	9.53E−03	5.48E−03	8.11E−04
65.00	2.38E+00	1.62E+00	1.38E−01	1.76E−02	6.76E−03	3.74E−03	5.14E−04
70.00	2.04E+00	1.37E+00	1.07E−01	1.39E−02	4.90E−03	2.63E−03	3.47E−04
75.00	1.78E+00	1.18E+00	8.73E−02	1.11E−02	3.66E−03	1.92E−03	2.49E−04
80.00	1.59E+00	1.04E+00	7.41E−02	9.11E−03	2.82E−03	1.46E−03	1.91E−04
85.00	1.44E+00	9.40E−01	6.54E−02	7.62E−03	2.25E−03	1.15E−03	1.54E−04
90.00	1.32E+00	8.64E−01	5.96E−02	6.52E−03	1.86E−03	9.46E−04	1.30E−04
95.00	1.23E+00	8.09E−01	5.59E−02	5.72E−03	1.59E−03	8.06E−04	1.15E−04
105.00	1.12E+00	7.44E−01	5.26E−02	4.68E−03	1.25E−03	6.34E−04	9.64E−05
120.00	1.06E+00	7.17E−01	5.30E−02	3.89E−03	1.01E−03	5.10E−04	8.41E−05
135.00	1.06E+00	7.28E−01	5.58E−02	3.49E−03	8.86E−04	4.50E−04	7.90E−05
150.00	1.08E+00	7.49E−01	5.88E−02	3.28E−03	8.22E−04	4.18E−04	7.70E−05
165.00	1.09E+00	7.66E−01	6.08E−02	3.17E−03	7.89E−04	4.02E−04	7.63E−05
180.00	1.10E+00	7.72E−01	6.15E−02	3.13E−03	7.78E−04	3.97E−04	7.61E−05
total	6.69E+01	5.16E+01	1.03E+01	2.31E+00	1.39E+00	1.07E+00	5.43E−01
rel ff	6.43E+01	4.83E+01	1.01E+01	2.33E+00	1.41E+00	1.10E+00	5.58E−01
nrl ff	6.62E+01	4.99E+01	1.05E+01	2.46E+00	1.49E+00	1.16E+00	5.90E−01

TABLE 1. Predicted *S*-matrix differential elastic scattering cross sections for photon energies (50.0, 59.54, 145.4, 316.5, 411.8, 468.1, 661.6, 778.9, 964.0, 1004.8, 1112.1, 1274.5, 1408.0 and 1500.0). The angle integrated total cross sections for each element and energies are presented. ''total'' represents total cross sections from this work, ''rel ff'' represents total cross sections calculated from the relativistic form factor and ''nrl ff'' represents total cross sections calculated from the nonrelativistic form factor—Continued[a]

θ (deg)	Photon energy (keV)						
	778.9	964.0	1004.8	1112.1	1274.5	1408.0	1500.0
Antimony ($Z=51$)							
0.00	2.04E+02	2.04E+02	2.04E+02	2.04E+02	2.04E+02	2.04E+02	2.03E+02
0.01	2.04E+02	2.04E+02	2.04E+02	2.04E+02	2.03E+02	2.03E+02	2.03E+02
0.02	2.04E+02	2.03E+02	2.03E+02	2.03E+02	2.02E+02	2.02E+02	2.02E+02
0.04	2.02E+02	2.01E+02	2.00E+02	2.00E+02	1.98E+02	1.97E+02	1.97E+02
0.06	1.99E+02	1.97E+02	1.97E+02	1.95E+02	1.92E+02	1.90E+02	1.88E+02
0.10	1.92E+02	1.87E+02	1.86E+02	1.83E+02	1.77E+02	1.73E+02	1.70E+02
0.20	1.69E+02	1.58E+02	1.55E+02	1.49E+02	1.40E+02	1.32E+02	1.28E+02
0.30	1.46E+02	1.30E+02	1.27E+02	1.19E+02	1.07E+02	9.84E+01	9.27E+01
0.40	1.25E+02	1.07E+02	1.03E+02	9.39E+01	8.19E+01	7.34E+01	6.83E+01
0.50	1.06E+02	8.69E+01	8.33E+01	7.45E+01	6.33E+01	5.58E+01	5.15E+01
0.60	8.98E+01	7.13E+01	6.78E+01	5.97E+01	4.99E+01	4.37E+01	4.03E+01
0.70	7.64E+01	5.90E+01	5.58E+01	4.87E+01	4.04E+01	3.55E+01	3.30E+01
0.80	6.53E+01	4.94E+01	4.67E+01	4.05E+01	3.36E+01	2.97E+01	2.78E+01
1.00	4.90E+01	3.64E+01	3.43E+01	2.96E+01	2.46E+01	2.18E+01	2.03E+01
1.20	3.82E+01	2.83E+01	2.67E+01	2.30E+01	1.88E+01	1.60E+01	1.43E+01
1.50	2.81E+01	2.07E+01	1.94E+01	1.64E+01	1.25E+01	9.58E+00	7.72E+00
1.70	2.35E+01	1.69E+01	1.58E+01	1.30E+01	9.39E+00	6.75E+00	5.13E+00
2.00	1.82E+01	1.24E+01	1.13E+01	8.99E+00	6.10E+00	4.21E+00	3.14E+00
2.50	1.18E+01	7.04E+00	6.31E+00	4.78E+00	3.27E+00	2.51E+00	2.17E+00
3.00	7.61E+00	4.15E+00	3.68E+00	2.79E+00	2.08E+00	1.92E+00	2.00E+00
3.50	5.03E+00	2.75E+00	2.45E+00	1.91E+00	1.51E+00	1.48E+00	1.61E+00
4.00	3.53E+00	2.06E+00	1.87E+00	1.50E+00	1.17E+00	1.03E+00	9.79E−01
5.00	2.09E+00	1.40E+00	1.29E+00	1.05E+00	6.96E−01	4.25E−01	2.67E−01
6.00	1.43E+00	9.37E−01	8.55E−01	6.57E−01	3.84E−01	2.01E−01	1.11E−01
7.00	1.02E+00	5.80E−01	5.14E−01	3.71E−01	2.16E−01	1.27E−01	8.35E−02
8.00	7.10E−01	3.52E−01	3.04E−01	2.12E−01	1.33E−01	9.99E−02	8.69E−02
9.00	4.90E−01	2.22E−01	1.90E−01	1.33E−01	9.25E−02	8.55E−02	9.35E−02
10.00	3.41E−01	1.53E−01	1.31E−01	9.38E−02	7.07E−02	7.29E−02	8.79E−02
12.50	1.59E−01	8.43E−02	7.55E−02	5.90E−02	4.52E−02	3.95E−02	3.71E−02
15.00	9.41E−02	6.00E−02	5.54E−02	4.49E−02	3.00E−02	1.81E−02	1.10E−02
17.50	6.52E−02	4.33E−02	3.99E−02	3.13E−02	1.82E−02	8.75E−03	4.28E−03
20.00	4.83E−02	2.97E−02	2.66E−02	1.94E−02	1.01E−02	4.57E−03	2.19E−03
22.50	3.60E−02	1.94E−02	1.69E−02	1.13E−02	5.46E−03	2.50E−03	1.29E−03
25.00	2.65E−02	1.24E−02	1.04E−02	6.50E−03	2.94E−03	1.39E−03	7.79E−04
27.50	1.92E−02	7.89E−03	6.45E−03	3.75E−03	1.60E−03	7.72E−04	4.60E−04
30.00	1.37E−02	5.02E−03	4.01E−03	2.20E−03	8.93E−04	4.33E−04	2.68E−04
35.00	6.77E−03	2.07E−03	1.59E−03	8.01E−04	2.95E−04	1.38E−04	8.56E−05
40.00	3.34E−03	8.95E−04	6.71E−04	3.19E−04	1.10E−04	4.94E−05	3.01E−05
45.00	1.68E−03	4.11E−04	3.04E−04	1.41E−04	4.79E−05	2.19E−05	1.37E−05
50.00	8.79E−04	2.03E−04	1.50E−04	6.95E−05	2.47E−05	1.21E−05	8.07E−06
55.00	4.83E−04	1.10E−04	8.14E−05	3.93E−05	1.56E−05	8.88E−06	6.74E−06
60.00	2.84E−04	6.62E−05	4.99E−05	2.56E−05	1.18E−05	7.96E−06	6.99E−06
65.00	1.80E−04	4.42E−05	3.40E−05	1.87E−05	9.87E−06	7.65E−06	7.49E−06
70.00	1.24E−04	3.29E−05	2.59E−05	1.52E−05	9.07E−06	7.76E−06	8.10E−06
75.00	9.17E−05	2.67E−05	2.16E−05	1.36E−05	8.84E−06	7.99E−06	8.52E−06
80.00	7.30E−05	2.33E−05	1.92E−05	1.27E−05	8.86E−06	8.19E−06	8.64E−06
85.00	6.13E−05	2.13E−05	1.79E−05	1.25E−05	9.13E−06	8.51E−06	8.82E−06
90.00	5.41E−05	2.03E−05	1.74E−05	1.26E−05	9.57E−06	8.93E−06	9.07E−06
95.00	4.93E−05	1.97E−05	1.71E−05	1.28E−05	1.00E−05	9.32E−06	9.26E−06
105.00	4.41E−05	1.96E−05	1.74E−05	1.37E−05	1.12E−05	1.03E−05	9.82E−06
120.00	4.11E−05	2.05E−05	1.86E−05	1.54E−05	1.32E−05	1.19E−05	1.09E−05
135.00	4.08E−05	2.22E−05	2.05E−05	1.76E−05	1.53E−05	1.35E−05	1.17E−05
150.00	4.12E−05	2.37E−05	2.21E−05	1.94E−05	1.71E−05	1.48E−05	1.25E−05
165.00	4.17E−05	2.48E−05	2.33E−05	2.08E−05	1.85E−05	1.58E−05	1.31E−05
180.00	4.19E−05	2.52E−05	2.37E−05	2.13E−05	1.90E−05	1.62E−05	1.34E−05
total	3.91E−01	2.56E−01	2.36E−01	1.93E−01	1.46E−01	1.19E−01	1.06E−01
rel ff	4.05E−01	2.65E−01	2.44E−01	1.99E−01	1.52E−01	1.25E−01	1.10E−01
nrl ff	4.28E−01	2.81E−01	2.59E−01	2.11E−01	1.61E−01	1.32E−01	1.17E−01

TABLE 1. Predicted *S*-matrix differential elastic scattering cross sections for photon energies (50.0, 59.54, 145.4, 316.5, 411.8, 468.1, 661.6, 778.9, 964.0, 1004.8, 1112.1, 1274.5, 1408.0 and 1500.0). The angle integrated total cross sections for each element and energies are presented. ''total'' represents total cross sections from this work, ''rel ff'' represents total cross sections calculated from the relativistic form factor and ''nrl ff'' represents total cross sections calculated from the nonrelativistic form factor—Continued[a]

θ (deg)	Photon energy (keV)						
	50.0	59.5	145.4	316.5	411.8	468.1	661.6
Tellurium ($Z=52$))							
0.00	2.16E+02	2.15E+02	2.14E+02	2.12E+02	2.12E+02	2.12E+02	2.12E+02
0.01	2.16E+02	2.15E+02	2.14E+02	2.12E+02	2.12E+02	2.12E+02	2.12E+02
0.02	2.16E+02	2.15E+02	2.14E+02	2.12E+02	2.12E+02	2.12E+02	2.12E+02
0.04	2.16E+02	2.15E+02	2.13E+02	2.12E+02	2.12E+02	2.11E+02	2.10E+02
0.06	2.16E+02	2.15E+02	2.13E+02	2.12E+02	2.11E+02	2.10E+02	2.08E+02
0.10	2.16E+02	2.15E+02	2.13E+02	2.10E+02	2.08E+02	2.07E+02	2.03E+02
0.20	2.15E+02	2.15E+02	2.12E+02	2.04E+02	1.98E+02	1.95E+02	1.83E+02
0.30	2.15E+02	2.15E+02	2.09E+02	1.95E+02	1.86E+02	1.80E+02	1.62E+02
0.40	2.15E+02	2.14E+02	2.06E+02	1.85E+02	1.73E+02	1.66E+02	1.42E+02
0.50	2.14E+02	2.13E+02	2.03E+02	1.75E+02	1.60E+02	1.51E+02	1.24E+02
0.60	2.14E+02	2.12E+02	1.98E+02	1.65E+02	1.48E+02	1.38E+02	1.08E+02
0.70	2.13E+02	2.11E+02	1.94E+02	1.55E+02	1.36E+02	1.25E+02	9.41E+01
0.80	2.12E+02	2.10E+02	1.89E+02	1.46E+02	1.25E+02	1.14E+02	8.21E+01
1.00	2.10E+02	2.07E+02	1.80E+02	1.28E+02	1.05E+02	9.33E+01	6.33E+01
1.20	2.08E+02	2.04E+02	1.71E+02	1.12E+02	8.83E+01	7.70E+01	4.99E+01
1.50	2.04E+02	1.99E+02	1.57E+02	9.21E+01	6.89E+01	5.89E+01	3.67E+01
1.70	2.01E+02	1.96E+02	1.49E+02	8.09E+01	5.90E+01	5.00E+01	3.08E+01
2.00	1.97E+02	1.90E+02	1.36E+02	6.71E+01	4.76E+01	4.00E+01	2.44E+01
2.50	1.89E+02	1.80E+02	1.17E+02	5.04E+01	3.50E+01	2.91E+01	1.72E+01
3.00	1.81E+02	1.71E+02	1.00E+02	3.93E+01	2.70E+01	2.22E+01	1.21E+01
3.50	1.74E+02	1.62E+02	8.61E+01	3.16E+01	2.16E+01	1.73E+01	8.39E+00
4.00	1.67E+02	1.53E+02	7.44E+01	2.60E+01	1.74E+01	1.35E+01	5.84E+00
5.00	1.52E+02	1.35E+02	5.65E+01	1.83E+01	1.12E+01	8.25E+00	3.19E+00
6.00	1.37E+02	1.19E+02	4.42E+01	1.31E+01	7.08E+00	5.13E+00	2.10E+00
7.00	1.22E+02	1.05E+02	3.57E+01	9.35E+00	4.62E+00	3.36E+00	1.55E+00
8.00	1.09E+02	9.28E+01	2.96E+01	6.73E+00	3.23E+00	2.38E+00	1.18E+00
9.00	9.58E+01	8.20E+01	2.50E+01	4.93E+00	2.44E+00	1.81E+00	8.78E−01
10.00	8.47E+01	7.27E+01	2.13E+01	3.71E+00	1.95E+00	1.44E+00	6.42E−01
12.50	6.41E+01	5.49E+01	1.45E+01	2.11E+00	1.25E+00	8.86E−01	2.93E−01
15.00	5.13E+01	4.27E+01	9.73E+00	1.40E+00	7.89E−01	5.35E−01	1.56E−01
17.50	4.30E+01	3.42E+01	6.50E+00	9.88E−01	4.79E−01	3.18E−01	1.00E−01
20.00	3.69E+01	2.81E+01	4.46E+00	7.01E−01	2.95E−01	1.96E−01	7.32E−02
22.50	3.17E+01	2.35E+01	3.24E+00	4.93E−01	1.92E−01	1.30E−01	5.66E−02
25.00	2.71E+01	1.98E+01	2.48E+00	3.47E−01	1.36E−01	9.38E−02	4.43E−02
27.50	2.30E+01	1.68E+01	2.00E+00	2.48E−01	1.02E−01	7.22E−02	3.44E−02
30.00	1.93E+01	1.42E+01	1.66E+00	1.82E−01	8.16E−02	5.82E−02	2.63E−02
35.00	1.34E+01	1.01E+01	1.18E+00	1.07E−01	5.66E−02	4.04E−02	1.50E−02
40.00	9.32E+00	7.07E+00	8.44E−01	7.10E−02	4.08E−02	2.84E−02	8.30E−03
45.00	6.62E+00	5.00E+00	5.89E−01	5.12E−02	2.92E−02	1.96E−02	4.60E−03
50.00	4.88E+00	3.62E+00	4.06E−01	3.87E−02	2.07E−02	1.32E−02	2.59E−03
55.00	3.75E+00	2.72E+00	2.83E−01	3.00E−02	1.46E−02	8.87E−03	1.50E−03
60.00	3.00E+00	2.12E+00	2.02E−01	2.34E−02	1.03E−02	5.99E−03	9.11E−04
65.00	2.48E+00	1.71E+00	1.50E−01	1.85E−02	7.35E−03	4.12E−03	5.81E−04
70.00	2.12E+00	1.43E+00	1.16E−01	1.47E−02	5.36E−03	2.91E−03	3.93E−04
75.00	1.85E+00	1.23E+00	9.36E−02	1.19E−02	4.03E−03	2.13E−03	2.82E−04
80.00	1.64E+00	1.08E+00	7.89E−02	9.79E−03	3.12E−03	1.63E−03	2.16E−04
85.00	1.49E+00	9.78E−01	6.91E−02	8.24E−03	2.50E−03	1.29E−03	1.75E−04
90.00	1.38E+00	9.02E−01	6.27E−02	7.10E−03	2.08E−03	1.06E−03	1.48E−04
95.00	1.29E+00	8.49E−01	5.86E−02	6.25E−03	1.78E−03	9.08E−04	1.30E−04
105.00	1.19E+00	7.89E−01	5.49E−02	5.16E−03	1.41E−03	7.17E−04	1.09E−04
120.00	1.15E+00	7.71E−01	5.53E−02	4.32E−03	1.14E−03	5.78E−04	9.50E−05
135.00	1.16E+00	7.92E−01	5.83E−02	3.90E−03	1.00E−03	5.10E−04	8.90E−05
150.00	1.19E+00	8.21E−01	6.15E−02	3.67E−03	9.31E−04	4.74E−04	8.65E−05
165.00	1.22E+00	8.43E−01	6.37E−02	3.55E−03	8.94E−04	4.56E−04	8.55E−05
180.00	1.23E+00	8.50E−01	6.45E−02	3.51E−03	8.82E−04	4.51E−04	8.53E−05
total	7.02E+01	5.41E+01	1.08E+01	2.43E+00	1.46E+00	1.13E+00	5.71E−01
rel ff	6.74E+01	5.07E+01	1.06E+01	2.46E+00	1.48E+00	1.16E+00	5.87E−01
nrl ff	6.93E+01	5.24E+01	1.10E+01	2.59E+00	1.57E+00	1.22E+00	6.22E−01

TABLE 1. Predicted *S*-matrix differential elastic scattering cross sections for photon energies (50.0, 59.54, 145.4, 316.5, 411.8, 468.1, 661.6, 778.9, 964.0, 1004.8, 1112.1, 1274.5, 1408.0 and 1500.0). The angle integrated total cross sections for each element and energies are presented. ''total'' represents total cross sections from this work, ''rel ff'' represents total cross sections calculated from the relativistic form factor and ''nrl ff'' represents total cross sections calculated from the nonrelativistic form factor—Continued[a]

θ (deg)	Photon energy (keV)						
	778.9	964.0	1004.8	1112.1	1274.5	1408.0	1500.0
Tellurium ($Z=52$)							
0.00	2.12E+02	2.12E+02	2.12E+02	2.12E+02	2.12E+02	2.12E+02	2.11E+02
0.01	2.12E+02	2.12E+02	2.12E+02	2.12E+02	2.11E+02	2.11E+02	2.11E+02
0.02	2.11E+02	2.11E+02	2.11E+02	2.11E+02	2.10E+02	2.10E+02	2.09E+02
0.04	2.10E+02	2.08E+02	2.08E+02	2.07E+02	2.06E+02	2.05E+02	2.04E+02
0.06	2.07E+02	2.05E+02	2.04E+02	2.02E+02	2.00E+02	1.97E+02	1.95E+02
0.10	1.99E+02	1.94E+02	1.93E+02	1.89E+02	1.84E+02	1.80E+02	1.77E+02
0.20	1.75E+02	1.64E+02	1.61E+02	1.54E+02	1.45E+02	1.37E+02	1.32E+02
0.30	1.51E+02	1.35E+02	1.32E+02	1.23E+02	1.11E+02	1.02E+02	9.62E+01
0.40	1.29E+02	1.11E+02	1.07E+02	9.74E+01	8.51E+01	7.64E+01	7.12E+01
0.50	1.10E+02	9.02E+01	8.64E+01	7.74E+01	6.59E+01	5.84E+01	5.40E+01
0.60	9.32E+01	7.41E+01	7.06E+01	6.23E+01	5.22E+01	4.58E+01	4.23E+01
0.70	7.94E+01	6.15E+01	5.83E+01	5.09E+01	4.23E+01	3.71E+01	3.43E+01
0.80	6.81E+01	5.17E+01	4.88E+01	4.24E+01	3.51E+01	3.08E+01	2.86E+01
1.00	5.12E+01	3.80E+01	3.58E+01	3.09E+01	2.55E+01	2.24E+01	2.07E+01
1.20	3.99E+01	2.95E+01	2.77E+01	2.39E+01	1.94E+01	1.66E+01	1.50E+01
1.50	2.92E+01	2.13E+01	2.00E+01	1.70E+01	1.31E+01	1.03E+01	8.54E+00
1.70	2.43E+01	1.75E+01	1.63E+01	1.36E+01	9.96E+00	7.36E+00	5.76E+00
2.00	1.89E+01	1.30E+01	1.19E+01	9.56E+00	6.59E+00	4.59E+00	3.44E+00
2.50	1.25E+01	7.61E+00	6.85E+00	5.23E+00	3.54E+00	2.62E+00	2.16E+00
3.00	8.15E+00	4.52E+00	4.02E+00	3.03E+00	2.21E+00	1.93E+00	1.91E+00
3.50	5.43E+00	2.95E+00	2.62E+00	2.02E+00	1.57E+00	1.51E+00	1.62E+00
4.00	3.79E+00	2.16E+00	1.94E+00	1.54E+00	1.21E+00	1.10E+00	1.09E+00
5.00	2.20E+00	1.43E+00	1.31E+00	1.06E+00	7.29E−01	4.79E−01	3.27E−01
6.00	1.49E+00	9.81E−01	8.98E−01	6.97E−01	4.15E−01	2.21E−01	1.23E−01
7.00	1.06E+00	6.27E−01	5.60E−01	4.10E−01	2.36E−01	1.33E−01	8.17E−02
8.00	7.51E−01	3.86E−01	3.36E−01	2.36E−01	1.44E−01	1.01E−01	8.04E−02
9.00	5.26E−01	2.44E−01	2.09E−01	1.46E−01	9.83E−02	8.55E−02	8.75E−02
10.00	3.69E−01	1.65E−01	1.42E−01	1.00E−01	7.37E−02	7.37E−02	8.66E−02
12.50	1.71E−01	8.73E−02	7.75E−02	5.97E−02	4.62E−02	4.23E−02	4.25E−02
15.00	9.89E−02	6.12E−02	5.62E−02	4.54E−02	3.11E−02	1.99E−02	1.31E−02
17.50	6.76E−02	4.48E−02	4.13E−02	3.27E−02	1.94E−02	9.58E−03	4.81E−03
20.00	4.99E−02	3.13E−02	2.83E−02	2.10E−02	1.11E−02	4.97E−03	2.35E−03
22.50	3.74E−02	2.08E−02	1.82E−02	1.25E−02	6.07E−03	2.73E−03	1.36E−03
25.00	2.79E−02	1.35E−02	1.14E−02	7.23E−03	3.29E−03	1.53E−03	8.30E−04
27.50	2.04E−02	8.65E−03	7.11E−03	4.20E−03	1.81E−03	8.60E−04	5.01E−04
30.00	1.47E−02	5.54E−03	4.45E−03	2.47E−03	1.01E−03	4.88E−04	2.97E−04
35.00	7.39E−03	2.31E−03	1.78E−03	9.05E−04	3.36E−04	1.58E−04	9.77E−05
40.00	3.70E−03	1.01E−03	7.57E−04	3.62E−04	1.25E−04	5.67E−05	3.47E−05
45.00	1.88E−03	4.65E−04	3.44E−04	1.60E−04	5.46E−05	2.50E−05	1.56E−05
50.00	9.89E−04	2.31E−04	1.70E−04	7.90E−05	2.80E−05	1.37E−05	9.06E−06
55.00	5.46E−04	1.25E−04	9.25E−05	4.45E−05	1.75E−05	9.85E−06	7.42E−06
60.00	3.22E−04	7.52E−05	5.66E−05	2.89E−05	1.32E−05	8.75E−06	7.60E−06
65.00	2.04E−04	5.00E−05	3.84E−05	2.09E−05	1.09E−05	8.35E−06	8.10E−06
70.00	1.40E−04	3.71E−05	2.91E−05	1.70E−05	9.97E−06	8.42E−06	8.73E−06
75.00	1.04E−04	3.01E−05	2.42E−05	1.50E−05	9.66E−06	8.64E−06	9.17E−06
80.00	8.28E−05	2.61E−05	2.15E−05	1.41E−05	9.64E−06	8.83E−06	9.29E−06
85.00	6.94E−05	2.38E−05	1.99E−05	1.37E−05	9.89E−06	9.15E−06	9.48E−06
90.00	6.12E−05	2.26E−05	1.92E−05	1.38E−05	1.03E−05	9.58E−06	9.73E−06
95.00	5.57E−05	2.19E−05	1.89E−05	1.40E−05	1.08E−05	9.99E−06	9.93E−06
105.00	4.96E−05	2.17E−05	1.91E−05	1.49E−05	1.20E−05	1.10E−05	1.06E−05
120.00	4.60E−05	2.25E−05	2.03E−05	1.66E−05	1.40E−05	1.27E−05	1.17E−05
135.00	4.54E−05	2.41E−05	2.22E−05	1.88E−05	1.62E−05	1.43E−05	1.26E−05
150.00	4.56E−05	2.57E−05	2.38E−05	2.07E−05	1.81E−05	1.58E−05	1.35E−05
165.00	4.61E−05	2.68E−05	2.50E−05	2.21E−05	1.95E−05	1.68E−05	1.42E−05
180.00	4.63E−05	2.72E−05	2.55E−05	2.26E−05	2.00E−05	1.73E−05	1.45E−05
total	4.11E−01	2.69E−01	2.48E−01	2.03E−01	1.54E−01	1.25E−01	1.11E−01
rel ff	4.26E−01	2.79E−01	2.57E−01	2.10E−01	1.60E−01	1.31E−01	1.16E−01
nrl ff	4.51E−01	2.96E−01	2.73E−01	2.23E−01	1.69E−01	1.39E−01	1.23E−01

TABLE 1. Predicted *S*-matrix differential elastic scattering cross sections for photon energies (50.0, 59.54, 145.4, 316.5, 411.8, 468.1, 661.6, 778.9, 964.0, 1004.8, 1112.1, 1274.5, 1408.0 and 1500.0). The angle integrated total cross sections for each element and energies are presented. ''total'' represents total cross sections from this work, ''rel ff'' represents total cross sections calculated from the relativistic form factor and ''nrl ff'' represents total cross sections calculated from the nonrelativistic form factor—Continued[a]

θ (deg)	Photon energy (keV)						
	50.0	59.5	145.4	316.5	411.8	468.1	661.6
Iodine ($Z=53$)							
0.00	2.24E+02	2.24E+02	2.22E+02	2.21E+02	2.20E+02	2.20E+02	2.20E+02
0.01	2.24E+02	2.24E+02	2.22E+02	2.21E+02	2.20E+02	2.20E+02	2.20E+02
0.02	2.24E+02	2.24E+02	2.22E+02	2.20E+02	2.20E+02	2.20E+02	2.20E+02
0.04	2.24E+02	2.23E+02	2.22E+02	2.20E+02	2.20E+02	2.20E+02	2.18E+02
0.06	2.24E+02	2.23E+02	2.22E+02	2.20E+02	2.19E+02	2.18E+02	2.16E+02
0.10	2.24E+02	2.23E+02	2.21E+02	2.18E+02	2.16E+02	2.15E+02	2.10E+02
0.20	2.24E+02	2.23E+02	2.20E+02	2.11E+02	2.06E+02	2.02E+02	1.90E+02
0.30	2.23E+02	2.23E+02	2.17E+02	2.02E+02	1.93E+02	1.87E+02	1.68E+02
0.40	2.23E+02	2.22E+02	2.14E+02	1.92E+02	1.79E+02	1.72E+02	1.48E+02
0.50	2.22E+02	2.21E+02	2.10E+02	1.81E+02	1.66E+02	1.57E+02	1.29E+02
0.60	2.22E+02	2.20E+02	2.06E+02	1.71E+02	1.53E+02	1.43E+02	1.12E+02
0.70	2.21E+02	2.19E+02	2.01E+02	1.61E+02	1.41E+02	1.30E+02	9.77E+01
0.80	2.20E+02	2.18E+02	1.96E+02	1.51E+02	1.30E+02	1.18E+02	8.53E+01
1.00	2.18E+02	2.15E+02	1.87E+02	1.33E+02	1.09E+02	9.69E+01	6.60E+01
1.20	2.16E+02	2.12E+02	1.77E+02	1.17E+02	9.18E+01	8.02E+01	5.22E+01
1.50	2.11E+02	2.07E+02	1.63E+02	9.57E+01	7.18E+01	6.15E+01	3.83E+01
1.70	2.08E+02	2.03E+02	1.54E+02	8.42E+01	6.16E+01	5.22E+01	3.20E+01
2.00	2.04E+02	1.97E+02	1.41E+02	6.99E+01	4.98E+01	4.18E+01	2.53E+01
2.50	1.96E+02	1.87E+02	1.21E+02	5.27E+01	3.65E+01	3.03E+01	1.79E+01
3.00	1.88E+02	1.77E+02	1.04E+02	4.10E+01	2.80E+01	2.30E+01	1.27E+01
3.50	1.80E+02	1.67E+02	8.96E+01	3.29E+01	2.23E+01	1.79E+01	8.98E+00
4.00	1.73E+02	1.58E+02	7.75E+01	2.70E+01	1.80E+01	1.41E+01	6.31E+00
5.00	1.57E+02	1.40E+02	5.91E+01	1.90E+01	1.18E+01	8.78E+00	3.41E+00
6.00	1.42E+02	1.24E+02	4.63E+01	1.37E+01	7.62E+00	5.52E+00	2.19E+00
7.00	1.27E+02	1.09E+02	3.73E+01	9.91E+00	4.99E+00	3.61E+00	1.60E+00
8.00	1.13E+02	9.62E+01	3.07E+01	7.20E+00	3.45E+00	2.53E+00	1.22E+00
9.00	9.99E+01	8.52E+01	2.59E+01	5.29E+00	2.57E+00	1.90E+00	9.27E−01
10.00	8.85E+01	7.56E+01	2.21E+01	3.98E+00	2.03E+00	1.50E+00	6.87E−01
12.50	6.70E+01	5.73E+01	1.52E+01	2.23E+00	1.30E+00	9.25E−01	3.18E−01
15.00	5.33E+01	4.46E+01	1.04E+01	1.46E+00	8.37E−01	5.71E−01	1.67E−01
17.50	4.43E+01	3.56E+01	7.01E+00	1.03E+00	5.17E−01	3.44E−01	1.05E−01
20.00	3.78E+01	2.91E+01	4.82E+00	7.39E−01	3.20E−01	2.12E−01	7.58E−02
22.50	3.25E+01	2.43E+01	3.47E+00	5.27E−01	2.08E−01	1.40E−01	5.84E−02
25.00	2.79E+01	2.05E+01	2.63E+00	3.74E−01	1.45E−01	9.93E−02	4.59E−02
27.50	2.38E+01	1.74E+01	2.09E+00	2.68E−01	1.08E−01	7.54E−02	3.59E−02
30.00	2.02E+01	1.48E+01	1.72E+00	1.96E−01	8.50E−02	6.03E−02	2.78E−02
35.00	1.42E+01	1.06E+01	1.23E+00	1.14E−01	5.85E−02	4.17E−02	1.60E−02
40.00	9.99E+00	7.56E+00	8.88E−01	7.47E−02	4.23E−02	2.96E−02	9.00E−03
45.00	7.12E+00	5.38E+00	6.28E−01	5.33E−02	3.06E−02	2.06E−02	5.05E−03
50.00	5.23E+00	3.90E+00	4.38E−01	4.02E−02	2.19E−02	1.41E−02	2.87E−03
55.00	3.99E+00	2.91E+00	3.07E−01	3.11E−02	1.55E−02	9.57E−03	1.68E−03
60.00	3.16E+00	2.25E+00	2.20E−01	2.45E−02	1.11E−02	6.51E−03	1.02E−03
65.00	2.59E+00	1.80E+00	1.62E−01	1.94E−02	7.96E−03	4.51E−03	6.53E−04
70.00	2.19E+00	1.49E+00	1.25E−01	1.56E−02	5.85E−03	3.21E−03	4.43E−04
75.00	1.91E+00	1.28E+00	1.00E−01	1.27E−02	4.42E−03	2.37E−03	3.19E−04
80.00	1.70E+00	1.12E+00	8.39E−02	1.05E−02	3.44E−03	1.81E−03	2.45E−04
85.00	1.54E+00	1.02E+00	7.31E−02	8.88E−03	2.77E−03	1.44E−03	1.98E−04
90.00	1.43E+00	9.38E−01	6.60E−02	7.69E−03	2.31E−03	1.19E−03	1.68E−04
95.00	1.35E+00	8.85E−01	6.15E−02	6.81E−03	1.98E−03	1.02E−03	1.47E−04
105.00	1.26E+00	8.30E−01	5.74E−02	5.66E−03	1.58E−03	8.09E−04	1.24E−04
120.00	1.23E+00	8.21E−01	5.77E−02	4.77E−03	1.28E−03	6.54E−04	1.07E−04
135.00	1.26E+00	8.52E−01	6.09E−02	4.33E−03	1.13E−03	5.78E−04	1.00E−04
150.00	1.31E+00	8.88E−01	6.44E−02	4.09E−03	1.05E−03	5.37E−04	9.70E−05
165.00	1.34E+00	9.15E−01	6.68E−02	3.96E−03	1.01E−03	5.17E−04	9.57E−05
180.00	1.35E+00	9.24E−01	6.76E−02	3.92E−03	9.97E−04	5.10E−04	9.54E−05
total	7.34E+01	5.67E+01	1.13E+01	2.56E+00	1.53E+00	1.19E+00	6.00E−01
rel ff	7.05E+01	5.32E+01	1.11E+01	2.59E+00	1.56E+00	1.22E+00	6.19E−01
nrl ff	7.27E+01	5.50E+01	1.16E+01	2.73E+00	1.65E+00	1.29E+00	6.55E−01

TABLE 1. Predicted *S*-matrix differential elastic scattering cross sections for photon energies (50.0, 59.54, 145.4, 316.5, 411.8, 468.1, 661.6, 778.9, 964.0, 1004.8, 1112.1, 1274.5, 1408.0 and 1500.0). The angle integrated total cross sections for each element and energies are presented. ''total'' represents total cross sections from this work, ''rel ff'' represents total cross sections calculated from the relativistic form factor and ''nrl ff'' represents total cross sections calculated from the nonrelativistic form factor—Continued[a]

θ (deg)	Photon energy (keV)						
	778.9	964.0	1004.8	1112.1	1274.5	1408.0	1500.0
Iodine ($Z=53$)							
0.00	2.20E+02	2.20E+02	2.20E+02	2.20E+02	2.20E+02	2.20E+02	2.20E+02
0.01	2.20E+02	2.20E+02	2.20E+02	2.20E+02	2.20E+02	2.19E+02	2.19E+02
0.02	2.20E+02	2.19E+02	2.19E+02	2.19E+02	2.18E+02	2.18E+02	2.17E+02
0.04	2.18E+02	2.16E+02	2.16E+02	2.15E+02	2.14E+02	2.12E+02	2.12E+02
0.06	2.15E+02	2.12E+02	2.12E+02	2.10E+02	2.07E+02	2.04E+02	2.02E+02
0.10	2.07E+02	2.01E+02	2.00E+02	1.96E+02	1.91E+02	1.86E+02	1.83E+02
0.20	1.82E+02	1.70E+02	1.67E+02	1.60E+02	1.50E+02	1.43E+02	1.37E+02
0.30	1.57E+02	1.40E+02	1.37E+02	1.28E+02	1.15E+02	1.06E+02	9.98E+01
0.40	1.34E+02	1.15E+02	1.11E+02	1.01E+02	8.84E+01	7.96E+01	7.43E+01
0.50	1.14E+02	9.37E+01	8.98E+01	8.04E+01	6.87E+01	6.10E+01	5.66E+01
0.60	9.68E+01	7.71E+01	7.35E+01	6.49E+01	5.45E+01	4.80E+01	4.43E+01
0.70	8.26E+01	6.42E+01	6.09E+01	5.32E+01	4.42E+01	3.87E+01	3.57E+01
0.80	7.10E+01	5.41E+01	5.11E+01	4.44E+01	3.66E+01	3.20E+01	2.95E+01
1.00	5.35E+01	3.98E+01	3.75E+01	3.23E+01	2.65E+01	2.30E+01	2.12E+01
1.20	4.17E+01	3.06E+01	2.88E+01	2.47E+01	2.01E+01	1.72E+01	1.56E+01
1.50	3.03E+01	2.20E+01	2.07E+01	1.75E+01	1.37E+01	1.10E+01	9.37E+00
1.70	2.52E+01	1.81E+01	1.69E+01	1.41E+01	1.05E+01	8.00E+00	6.42E+00
2.00	1.96E+01	1.36E+01	1.25E+01	1.01E+01	7.08E+00	4.99E+00	3.77E+00
2.50	1.31E+01	8.19E+00	7.40E+00	5.69E+00	3.82E+00	2.74E+00	2.16E+00
3.00	8.71E+00	4.91E+00	4.37E+00	3.29E+00	2.34E+00	1.95E+00	1.83E+00
3.50	5.84E+00	3.16E+00	2.81E+00	2.14E+00	1.63E+00	1.54E+00	1.64E+00
4.00	4.07E+00	2.26E+00	2.02E+00	1.58E+00	1.24E+00	1.17E+00	1.21E+00
5.00	2.31E+00	1.46E+00	1.34E+00	1.08E+00	7.63E−01	5.35E−01	3.94E−01
6.00	1.55E+00	1.03E+00	9.41E−01	7.37E−01	4.47E−01	2.42E−01	1.36E−01
7.00	1.11E+00	6.75E−01	6.06E−01	4.49E−01	2.57E−01	1.39E−01	8.12E−02
8.00	7.94E−01	4.21E−01	3.69E−01	2.61E−01	1.56E−01	1.02E−01	7.56E−02
9.00	5.63E−01	2.66E−01	2.29E−01	1.59E−01	1.04E−01	8.58E−02	8.25E−02
10.00	3.98E−01	1.78E−01	1.53E−01	1.07E−01	7.71E−02	7.47E−02	8.53E−02
12.50	1.83E−01	9.06E−02	7.99E−02	6.08E−02	4.73E−02	4.52E−02	4.79E−02
15.00	1.04E−01	6.26E−02	5.72E−02	4.59E−02	3.22E−02	2.18E−02	1.53E−02
17.50	7.02E−02	4.63E−02	4.27E−02	3.40E−02	2.06E−02	1.05E−02	5.39E−03
20.00	5.16E−02	3.29E−02	2.99E−02	2.25E−02	1.20E−02	5.40E−03	2.53E−03
22.50	3.89E−02	2.23E−02	1.96E−02	1.36E−02	6.70E−03	2.97E−03	1.44E−03
25.00	2.92E−02	1.46E−02	1.25E−02	8.00E−03	3.68E−03	1.68E−03	8.87E−04
27.50	2.16E−02	9.44E−03	7.81E−03	4.68E−03	2.03E−03	9.55E−04	5.45E−04
30.00	1.57E−02	6.09E−03	4.91E−03	2.77E−03	1.14E−03	5.47E−04	3.29E−04
35.00	8.04E−03	2.57E−03	1.99E−03	1.02E−03	3.82E−04	1.79E−04	1.11E−04
40.00	4.07E−03	1.13E−03	8.51E−04	4.09E−04	1.43E−04	6.48E−05	3.97E−05
45.00	2.09E−03	5.24E−04	3.89E−04	1.81E−04	6.21E−05	2.85E−05	1.78E−05
50.00	1.11E−03	2.61E−04	1.93E−04	8.96E−05	3.16E−05	1.54E−05	1.02E−05
55.00	6.14E−04	1.41E−04	1.05E−04	5.03E−05	1.97E−05	1.09E−05	8.17E−06
60.00	3.64E−04	8.51E−05	6.40E−05	3.25E−05	1.46E−05	9.61E−06	8.28E−06
65.00	2.31E−04	5.65E−05	4.33E−05	2.35E−05	1.21E−05	9.12E−06	8.77E−06
70.00	1.59E−04	4.18E−05	3.28E−05	1.90E−05	1.10E−05	9.15E−06	9.42E−06
75.00	1.18E−04	3.38E−05	2.71E−05	1.67E−05	1.06E−05	9.36E−06	9.88E−06
80.00	9.36E−05	2.92E−05	2.39E−05	1.56E−05	1.05E−05	9.52E−06	9.99E−06
85.00	7.85E−05	2.66E−05	2.22E−05	1.51E−05	1.07E−05	9.85E−06	1.02E−05
90.00	6.91E−05	2.52E−05	2.13E−05	1.51E−05	1.12E−05	1.03E−05	1.04E−05
95.00	6.28E−05	2.43E−05	2.09E−05	1.53E−05	1.16E−05	1.07E−05	1.07E−05
105.00	5.57E−05	2.39E−05	2.10E−05	1.61E−05	1.29E−05	1.18E−05	1.13E−05
120.00	5.14E−05	2.46E−05	2.21E−05	1.79E−05	1.49E−05	1.35E−05	1.26E−05
135.00	5.05E−05	2.63E−05	2.40E−05	2.02E−05	1.72E−05	1.53E−05	1.35E−05
150.00	5.06E−05	2.78E−05	2.57E−05	2.21E−05	1.92E−05	1.68E−05	1.45E−05
165.00	5.10E−05	2.90E−05	2.69E−05	2.35E−05	2.06E−05	1.79E−05	1.52E−05
180.00	5.11E−05	2.94E−05	2.74E−05	2.40E−05	2.11E−05	1.83E−05	1.55E−05
total	4.32E−01	2.83E−01	2.61E−01	2.13E−01	1.61E−01	1.31E−01	1.17E−01
rel ff	4.49E−01	2.94E−01	2.71E−01	2.21E−01	1.68E−01	1.39E−01	1.22E−01
nrl ff	4.76E−01	3.12E−01	2.88E−01	2.35E−01	1.79E−01	1.47E−01	1.30E−01

TABLE 1. Predicted *S*-matrix differential elastic scattering cross sections for photon energies (50.0, 59.54, 145.4, 316.5, 411.8, 468.1, 661.6, 778.9, 964.0, 1004.8, 1112.1, 1274.5, 1408.0 and 1500.0). The angle integrated total cross sections for each element and energies are presented. ''total'' represents total cross sections from this work, ''rel ff'' represents total cross sections calculated from the relativistic form factor and ''nrl ff'' represents total cross sections calculated from the nonrelativistic form factor—Continued[a]

θ (deg)	Photon energy (keV)						
	50.0	59.5	145.4	316.5	411.8	468.1	661.6
Xenon ($Z=54$)							
0.00	2.32E+02	2.32E+02	2.30E+02	2.29E+02	2.29E+02	2.29E+02	2.29E+02
0.01	2.32E+02	2.32E+02	2.30E+02	2.29E+02	2.29E+02	2.29E+02	2.28E+02
0.02	2.32E+02	2.32E+02	2.30E+02	2.29E+02	2.29E+02	2.28E+02	2.28E+02
0.04	2.32E+02	2.32E+02	2.30E+02	2.29E+02	2.28E+02	2.28E+02	2.27E+02
0.06	2.32E+02	2.32E+02	2.30E+02	2.28E+02	2.27E+02	2.27E+02	2.24E+02
0.10	2.32E+02	2.32E+02	2.30E+02	2.26E+02	2.24E+02	2.23E+02	2.18E+02
0.20	2.32E+02	2.31E+02	2.28E+02	2.19E+02	2.13E+02	2.10E+02	1.96E+02
0.30	2.31E+02	2.31E+02	2.25E+02	2.10E+02	2.00E+02	1.94E+02	1.74E+02
0.40	2.31E+02	2.30E+02	2.22E+02	1.99E+02	1.86E+02	1.78E+02	1.53E+02
0.50	2.30E+02	2.29E+02	2.18E+02	1.88E+02	1.72E+02	1.63E+02	1.34E+02
0.60	2.30E+02	2.28E+02	2.13E+02	1.77E+02	1.59E+02	1.49E+02	1.17E+02
0.70	2.29E+02	2.27E+02	2.08E+02	1.67E+02	1.46E+02	1.35E+02	1.01E+02
0.80	2.28E+02	2.26E+02	2.03E+02	1.57E+02	1.34E+02	1.22E+02	8.88E+01
1.00	2.26E+02	2.23E+02	1.93E+02	1.38E+02	1.13E+02	1.01E+02	6.89E+01
1.20	2.23E+02	2.19E+02	1.84E+02	1.21E+02	9.54E+01	8.34E+01	5.46E+01
1.50	2.19E+02	2.14E+02	1.69E+02	9.95E+01	7.49E+01	6.41E+01	4.00E+01
1.70	2.16E+02	2.10E+02	1.60E+02	8.76E+01	6.44E+01	5.45E+01	3.33E+01
2.00	2.11E+02	2.04E+02	1.46E+02	7.29E+01	5.21E+01	4.37E+01	2.62E+01
2.50	2.03E+02	1.93E+02	1.26E+02	5.50E+01	3.80E+01	3.16E+01	1.85E+01
3.00	1.95E+02	1.83E+02	1.08E+02	4.28E+01	2.91E+01	2.39E+01	1.34E+01
3.50	1.87E+02	1.74E+02	9.31E+01	3.43E+01	2.31E+01	1.86E+01	9.57E+00
4.00	1.79E+02	1.64E+02	8.07E+01	2.81E+01	1.87E+01	1.47E+01	6.79E+00
5.00	1.62E+02	1.45E+02	6.17E+01	1.98E+01	1.25E+01	9.31E+00	3.63E+00
6.00	1.46E+02	1.28E+02	4.84E+01	1.43E+01	8.17E+00	5.91E+00	2.29E+00
7.00	1.31E+02	1.13E+02	3.89E+01	1.05E+01	5.37E+00	3.87E+00	1.66E+00
8.00	1.17E+02	9.98E+01	3.20E+01	7.67E+00	3.69E+00	2.69E+00	1.27E+00
9.00	1.04E+02	8.85E+01	2.68E+01	5.67E+00	2.70E+00	1.99E+00	9.76E−01
10.00	9.24E+01	7.87E+01	2.28E+01	4.26E+00	2.11E+00	1.56E+00	7.33E−01
12.50	7.00E+01	5.97E+01	1.58E+01	2.35E+00	1.35E+00	9.65E−01	3.44E−01
15.00	5.54E+01	4.65E+01	1.10E+01	1.52E+00	8.86E−01	6.07E−01	1.78E−01
17.50	4.57E+01	3.71E+01	7.52E+00	1.07E+00	5.56E−01	3.70E−01	1.10E−01
20.00	3.88E+01	3.02E+01	5.19E+00	7.78E−01	3.46E−01	2.29E−01	7.85E−02
22.50	3.34E+01	2.51E+01	3.71E+00	5.60E−01	2.24E−01	1.50E−01	6.04E−02
25.00	2.87E+01	2.11E+01	2.78E+00	4.01E−01	1.54E−01	1.05E−01	4.76E−02
27.50	2.46E+01	1.80E+01	2.18E+00	2.88E−01	1.14E−01	7.90E−02	3.75E−02
30.00	2.10E+01	1.53E+01	1.79E+00	2.11E−01	8.87E−02	6.26E−02	2.92E−02
35.00	1.50E+01	1.12E+01	1.28E+00	1.22E−01	6.05E−02	4.31E−02	1.71E−02
40.00	1.06E+01	8.03E+00	9.33E−01	7.86E−02	4.38E−02	3.08E−02	9.74E−03
45.00	7.62E+00	5.76E+00	6.68E−01	5.56E−02	3.19E−02	2.17E−02	5.52E−03
50.00	5.58E+00	4.18E+00	4.71E−01	4.17E−02	2.30E−02	1.50E−02	3.16E−03
55.00	4.23E+00	3.10E+00	3.32E−01	3.23E−02	1.65E−02	1.03E−02	1.86E−03
60.00	3.32E+00	2.38E+00	2.38E−01	2.55E−02	1.19E−02	7.06E−03	1.14E−03
65.00	2.70E+00	1.89E+00	1.76E−01	2.03E−02	8.60E−03	4.93E−03	7.31E−04
70.00	2.27E+00	1.56E+00	1.34E−01	1.64E−02	6.36E−03	3.53E−03	4.98E−04
75.00	1.96E+00	1.33E+00	1.07E−01	1.34E−02	4.83E−03	2.61E−03	3.60E−04
80.00	1.74E+00	1.16E+00	8.93E−02	1.12E−02	3.78E−03	2.01E−03	2.76E−04
85.00	1.59E+00	1.05E+00	7.74E−02	9.54E−03	3.06E−03	1.61E−03	2.23E−04
90.00	1.48E+00	9.72E−01	6.96E−02	8.31E−03	2.56E−03	1.33E−03	1.89E−04
95.00	1.40E+00	9.19E−01	6.46E−02	7.39E−03	2.20E−03	1.14E−03	1.67E−04
105.00	1.32E+00	8.67E−01	6.01E−02	6.19E−03	1.76E−03	9.09E−04	1.40E−04
120.00	1.31E+00	8.67E−01	6.03E−02	5.26E−03	1.43E−03	7.36E−04	1.21E−04
135.00	1.35E+00	9.06E−01	6.37E−02	4.79E−03	1.27E−03	6.52E−04	1.12E−04
150.00	1.41E+00	9.49E−01	6.74E−02	4.54E−03	1.18E−03	6.06E−04	1.09E−04
165.00	1.45E+00	9.81E−01	7.00E−02	4.40E−03	1.14E−03	5.83E−04	1.07E−04
180.00	1.46E+00	9.92E−01	7.09E−02	4.36E−03	1.12E−03	5.76E−04	1.07E−04
total	7.66E+01	5.92E+01	1.19E+01	2.68E+00	1.61E+00	1.25E+00	6.30E−01
rel ff	7.37E+01	5.56E+01	1.16E+01	2.71E+00	1.64E+00	1.28E+00	6.49E−01
nrl ff	7.61E+01	5.76E+01	1.22E+01	2.87E+00	1.74E+00	1.36E+00	6.90E−01

TABLE 1. Predicted *S*-matrix differential elastic scattering cross sections for photon energies (50.0, 59.54, 145.4, 316.5, 411.8, 468.1, 661.6, 778.9, 964.0, 1004.8, 1112.1, 1274.5, 1408.0 and 1500.0). The angle integrated total cross sections for each element and energies are presented. ''total'' represents total cross sections from this work, ''rel ff'' represents total cross sections calculated from the relativistic form factor and ''nrl ff'' represents total cross sections calculated from the nonrelativistic form factor—Continued[a]

θ (deg)	Photon energy (keV)						
	778.9	964.0	1004.8	1112.1	1274.5	1408.0	1500.0
Xenon ($Z=54$)							
0.00	2.28E+02	2.28E+02	2.28E+02	2.28E+02	2.28E+02	2.28E+02	2.28E+02
0.01	2.28E+02	2.28E+02	2.28E+02	2.28E+02	2.28E+02	2.28E+02	2.27E+02
0.02	2.28E+02	2.27E+02	2.27E+02	2.27E+02	2.26E+02	2.26E+02	2.26E+02
0.04	2.26E+02	2.24E+02	2.24E+02	2.23E+02	2.22E+02	2.20E+02	2.19E+02
0.06	2.23E+02	2.20E+02	2.20E+02	2.18E+02	2.15E+02	2.12E+02	2.10E+02
0.10	2.14E+02	2.08E+02	2.07E+02	2.03E+02	1.98E+02	1.93E+02	1.90E+02
0.20	1.88E+02	1.76E+02	1.73E+02	1.66E+02	1.56E+02	1.48E+02	1.43E+02
0.30	1.63E+02	1.46E+02	1.42E+02	1.33E+02	1.20E+02	1.10E+02	1.04E+02
0.40	1.39E+02	1.19E+02	1.15E+02	1.05E+02	9.19E+01	8.28E+01	7.74E+01
0.50	1.18E+02	9.73E+01	9.33E+01	8.37E+01	7.16E+01	6.38E+01	5.94E+01
0.60	1.01E+02	8.03E+01	7.65E+01	6.77E+01	5.70E+01	5.02E+01	4.65E+01
0.70	8.60E+01	6.70E+01	6.36E+01	5.57E+01	4.63E+01	4.04E+01	3.72E+01
0.80	7.40E+01	5.65E+01	5.35E+01	4.65E+01	3.83E+01	3.32E+01	3.04E+01
1.00	5.60E+01	4.16E+01	3.92E+01	3.37E+01	2.75E+01	2.38E+01	2.17E+01
1.20	4.36E+01	3.19E+01	2.99E+01	2.56E+01	2.08E+01	1.79E+01	1.63E+01
1.50	3.15E+01	2.28E+01	2.13E+01	1.81E+01	1.43E+01	1.17E+01	1.02E+01
1.70	2.61E+01	1.87E+01	1.75E+01	1.47E+01	1.11E+01	8.64E+00	7.10E+00
2.00	2.03E+01	1.42E+01	1.32E+01	1.07E+01	7.58E+00	5.40E+00	4.11E+00
2.50	1.37E+01	8.78E+00	7.96E+00	6.16E+00	4.10E+00	2.86E+00	2.19E+00
3.00	9.26E+00	5.31E+00	4.73E+00	3.56E+00	2.47E+00	1.98E+00	1.78E+00
3.50	6.26E+00	3.38E+00	3.00E+00	2.27E+00	1.70E+00	1.57E+00	1.65E+00
4.00	4.35E+00	2.37E+00	2.11E+00	1.64E+00	1.28E+00	1.23E+00	1.32E+00
5.00	2.43E+00	1.50E+00	1.37E+00	1.10E+00	7.97E−01	5.94E−01	4.68E−01
6.00	1.61E+00	1.07E+00	9.84E−01	7.77E−01	4.80E−01	2.64E−01	1.51E−01
7.00	1.15E+00	7.22E−01	6.53E−01	4.89E−01	2.79E−01	1.46E−01	8.17E−02
8.00	8.38E−01	4.58E−01	4.03E−01	2.87E−01	1.69E−01	1.04E−01	7.21E−02
9.00	6.00E−01	2.90E−01	2.50E−01	1.74E−01	1.11E−01	8.65E−02	7.85E−02
10.00	4.27E−01	1.92E−01	1.65E−01	1.15E−01	8.07E−02	7.57E−02	8.40E−02
12.50	1.96E−01	9.43E−02	8.27E−02	6.21E−02	4.85E−02	4.80E−02	5.33E−02
15.00	1.10E−01	6.41E−02	5.83E−02	4.66E−02	3.33E−02	2.38E−02	1.77E−02
17.50	7.29E−02	4.78E−02	4.41E−02	3.53E−02	2.17E−02	1.14E−02	6.04E−03
20.00	5.34E−02	3.45E−02	3.15E−02	2.39E−02	1.30E−02	5.86E−03	2.73E−03
22.50	4.04E−02	2.37E−02	2.10E−02	1.48E−02	7.36E−03	3.23E−03	1.54E−03
25.00	3.06E−02	1.57E−02	1.35E−02	8.81E−03	4.08E−03	1.84E−03	9.48E−04
27.50	2.28E−02	1.03E−02	8.55E−03	5.19E−03	2.27E−03	1.06E−03	5.91E−04
30.00	1.67E−02	6.67E−03	5.41E−03	3.09E−03	1.29E−03	6.11E−04	3.63E−04
35.00	8.72E−03	2.85E−03	2.21E−03	1.14E−03	4.32E−04	2.03E−04	1.25E−04
40.00	4.47E−03	1.26E−03	9.54E−04	4.62E−04	1.62E−04	7.38E−05	4.53E−05
45.00	2.32E−03	5.89E−04	4.38E−04	2.05E−04	7.05E−05	3.23E−05	2.02E−05
50.00	1.24E−03	2.94E−04	2.18E−04	1.01E−04	3.57E−05	1.73E−05	1.14E−05
55.00	6.89E−04	1.60E−04	1.18E−04	5.68E−05	2.20E−05	1.21E−05	9.01E−06
60.00	4.09E−04	9.62E−05	7.23E−05	3.66E−05	1.63E−05	1.06E−05	9.02E−06
65.00	2.60E−04	6.38E−05	4.88E−05	2.63E−05	1.34E−05	9.96E−06	9.50E−06
70.00	1.79E−04	4.70E−05	3.68E−05	2.12E−05	1.21E−05	9.95E−06	1.02E−05
75.00	1.33E−04	3.79E−05	3.03E−05	1.85E−05	1.16E−05	1.01E−05	1.06E−05
80.00	1.06E−04	3.27E−05	2.67E−05	1.72E−05	1.14E−05	1.03E−05	1.07E−05
85.00	8.85E−05	2.96E−05	2.46E−05	1.66E−05	1.16E−05	1.06E−05	1.10E−05
90.00	7.79E−05	2.80E−05	2.36E−05	1.66E−05	1.21E−05	1.10E−05	1.12E−05
95.00	7.06E−05	2.70E−05	2.31E−05	1.67E−05	1.25E−05	1.15E−05	1.14E−05
105.00	6.25E−05	2.64E−05	2.30E−05	1.75E−05	1.38E−05	1.26E−05	1.22E−05
120.00	5.74E−05	2.69E−05	2.41E−05	1.93E−05	1.59E−05	1.44E−05	1.35E−05
135.00	5.61E−05	2.86E−05	2.60E−05	2.16E−05	1.83E−05	1.62E−05	1.46E−05
150.00	5.60E−05	3.01E−05	2.77E−05	2.36E−05	2.03E−05	1.78E−05	1.56E−05
165.00	5.63E−05	3.13E−05	2.90E−05	2.50E−05	2.17E−05	1.90E−05	1.64E−05
180.00	5.64E−05	3.17E−05	2.94E−05	2.55E−05	2.23E−05	1.95E−05	1.67E−05
total	4.53E−01	2.97E−01	2.74E−01	2.24E−01	1.69E−01	1.38E−01	1.23E−01
rel ff	4.71E−01	3.09E−01	2.85E−01	2.32E−01	1.77E−01	1.45E−01	1.28E−01
nrl ff	5.01E−01	3.29E−01	3.03E−01	2.47E−01	1.88E−01	1.55E−01	1.37E−01

TABLE 1. Predicted *S*-matrix differential elastic scattering cross sections for photon energies (50.0, 59.54, 145.4, 316.5, 411.8, 468.1, 661.6, 778.9, 964.0, 1004.8, 1112.1, 1274.5, 1408.0 and 1500.0). The angle integrated total cross sections for each element and energies are presented. ''total'' represents total cross sections from this work, ''rel ff'' represents total cross sections calculated from the relativistic form factor and ''nrl ff'' represents total cross sections calculated from the nonrelativistic form factor—Continued[a]

θ (deg)	Photon energy (keV)						
	50.0	59.5	145.4	316.5	411.8	468.1	661.6
Cesium ($Z=55$)							
0.00	2.40E+02	2.40E+02	2.39E+02	2.38E+02	2.37E+02	2.37E+02	2.37E+02
0.01	2.40E+02	2.40E+02	2.39E+02	2.37E+02	2.37E+02	2.37E+02	2.37E+02
0.02	2.40E+02	2.40E+02	2.39E+02	2.37E+02	2.37E+02	2.37E+02	2.37E+02
0.04	2.40E+02	2.40E+02	2.39E+02	2.37E+02	2.37E+02	2.36E+02	2.35E+02
0.06	2.40E+02	2.40E+02	2.39E+02	2.37E+02	2.36E+02	2.35E+02	2.33E+02
0.10	2.40E+02	2.40E+02	2.38E+02	2.35E+02	2.33E+02	2.31E+02	2.26E+02
0.20	2.40E+02	2.40E+02	2.37E+02	2.27E+02	2.21E+02	2.17E+02	2.04E+02
0.30	2.40E+02	2.39E+02	2.34E+02	2.17E+02	2.07E+02	2.01E+02	1.81E+02
0.40	2.39E+02	2.38E+02	2.30E+02	2.06E+02	1.93E+02	1.85E+02	1.59E+02
0.50	2.39E+02	2.38E+02	2.26E+02	1.95E+02	1.79E+02	1.69E+02	1.39E+02
0.60	2.38E+02	2.36E+02	2.21E+02	1.84E+02	1.65E+02	1.54E+02	1.21E+02
0.70	2.37E+02	2.35E+02	2.16E+02	1.73E+02	1.52E+02	1.40E+02	1.05E+02
0.80	2.36E+02	2.34E+02	2.11E+02	1.63E+02	1.40E+02	1.27E+02	9.23E+01
1.00	2.34E+02	2.31E+02	2.00E+02	1.43E+02	1.17E+02	1.05E+02	7.19E+01
1.20	2.31E+02	2.27E+02	1.90E+02	1.26E+02	9.92E+01	8.68E+01	5.71E+01
1.50	2.26E+02	2.21E+02	1.76E+02	1.03E+02	7.81E+01	6.69E+01	4.18E+01
1.70	2.23E+02	2.17E+02	1.66E+02	9.11E+01	6.72E+01	5.70E+01	3.47E+01
2.00	2.18E+02	2.11E+02	1.52E+02	7.60E+01	5.45E+01	4.56E+01	2.71E+01
2.50	2.10E+02	2.00E+02	1.31E+02	5.75E+01	3.97E+01	3.29E+01	1.92E+01
3.00	2.01E+02	1.90E+02	1.12E+02	4.47E+01	3.02E+01	2.48E+01	1.40E+01
3.50	1.93E+02	1.80E+02	9.69E+01	3.57E+01	2.39E+01	1.93E+01	1.02E+01
4.00	1.85E+02	1.70E+02	8.41E+01	2.92E+01	1.94E+01	1.54E+01	7.27E+00
5.00	1.68E+02	1.51E+02	6.45E+01	2.05E+01	1.31E+01	9.85E+00	3.87E+00
6.00	1.51E+02	1.33E+02	5.06E+01	1.50E+01	8.72E+00	6.32E+00	2.39E+00
7.00	1.36E+02	1.17E+02	4.06E+01	1.10E+01	5.76E+00	4.14E+00	1.72E+00
8.00	1.22E+02	1.04E+02	3.33E+01	8.16E+00	3.93E+00	2.85E+00	1.32E+00
9.00	1.08E+02	9.19E+01	2.78E+01	6.05E+00	2.85E+00	2.09E+00	1.03E+00
10.00	9.65E+01	8.18E+01	2.36E+01	4.55E+00	2.20E+00	1.62E+00	7.79E−01
12.50	7.31E+01	6.23E+01	1.65E+01	2.48E+00	1.40E+00	1.01E+00	3.70E−01
15.00	5.75E+01	4.85E+01	1.16E+01	1.59E+00	9.35E−01	6.44E−01	1.90E−01
17.50	4.72E+01	3.85E+01	8.05E+00	1.12E+00	5.96E−01	3.97E−01	1.16E−01
20.00	3.99E+01	3.13E+01	5.57E+00	8.18E−01	3.73E−01	2.46E−01	8.15E−02
22.50	3.42E+01	2.59E+01	3.96E+00	5.95E−01	2.40E−01	1.60E−01	6.25E−02
25.00	2.95E+01	2.18E+01	2.94E+00	4.28E−01	1.64E−01	1.11E−01	4.94E−02
27.50	2.54E+01	1.86E+01	2.29E+00	3.09E−01	1.20E−01	8.28E−02	3.91E−02
30.00	2.18E+01	1.59E+01	1.86E+00	2.26E−01	9.27E−02	6.51E−02	3.06E−02
35.00	1.58E+01	1.17E+01	1.33E+00	1.30E−01	6.26E−02	4.46E−02	1.82E−02
40.00	1.13E+01	8.49E+00	9.78E−01	8.28E−02	4.54E−02	3.20E−02	1.05E−02
45.00	8.11E+00	6.13E+00	7.09E−01	5.80E−02	3.33E−02	2.28E−02	6.01E−03
50.00	5.93E+00	4.45E+00	5.05E−01	4.33E−02	2.42E−02	1.59E−02	3.47E−03
55.00	4.46E+00	3.29E+00	3.58E−01	3.36E−02	1.75E−02	1.10E−02	2.06E−03
60.00	3.47E+00	2.51E+00	2.57E−01	2.66E−02	1.27E−02	7.63E−03	1.27E−03
65.00	2.80E+00	1.98E+00	1.89E−01	2.13E−02	9.25E−03	5.36E−03	8.17E−04
70.00	2.34E+00	1.62E+00	1.44E−01	1.73E−02	6.88E−03	3.86E−03	5.58E−04
75.00	2.01E+00	1.37E+00	1.15E−01	1.42E−02	5.26E−03	2.88E−03	4.04E−04
80.00	1.79E+00	1.20E+00	9.51E−02	1.19E−02	4.14E−03	2.22E−03	3.11E−04
85.00	1.63E+00	1.08E+00	8.20E−02	1.02E−02	3.36E−03	1.78E−03	2.51E−04
90.00	1.52E+00	1.00E+00	7.35E−02	8.94E−03	2.82E−03	1.48E−03	2.13E−04
95.00	1.44E+00	9.49E−01	6.80E−02	7.99E−03	2.44E−03	1.27E−03	1.88E−04
105.00	1.37E+00	8.99E−01	6.29E−02	6.74E−03	1.96E−03	1.02E−03	1.57E−04
120.00	1.37E+00	9.06E−01	6.30E−02	5.77E−03	1.60E−03	8.27E−04	1.36E−04
135.00	1.43E+00	9.53E−01	6.66E−02	5.29E−03	1.42E−03	7.33E−04	1.26E−04
150.00	1.49E+00	1.00E+00	7.05E−02	5.02E−03	1.33E−03	6.82E−04	1.21E−04
165.00	1.54E+00	1.04E+00	7.33E−02	4.88E−03	1.28E−03	6.57E−04	1.20E−04
180.00	1.56E+00	1.05E+00	7.43E−02	4.84E−03	1.26E−03	6.49E−04	1.19E−04
total	7.98E+01	6.17E+01	1.25E+01	2.82E+00	1.69E+00	1.31E+00	6.61E−01
rel ff	7.70E+01	5.81E+01	1.22E+01	2.84E+00	1.72E+00	1.34E+00	6.82E−01
nrl ff	7.96E+01	6.03E+01	1.28E+01	3.02E+00	1.83E+00	1.43E+00	7.26E−01

TABLE 1. Predicted *S*-matrix differential elastic scattering cross sections for photon energies (50.0, 59.54, 145.4, 316.5, 411.8, 468.1, 661.6, 778.9, 964.0, 1004.8, 1112.1, 1274.5, 1408.0 and 1500.0). The angle integrated total cross sections for each element and energies are presented. ''total'' represents total cross sections from this work, ''rel ff'' represents total cross sections calculated from the relativistic form factor and ''nrl ff'' represents total cross sections calculated from the nonrelativistic form factor—Continued[a]

θ (deg)	Photon energy (keV)						
	778.9	964.0	1004.8	1112.1	1274.5	1408.0	1500.0
Cesium ($Z=55$)							
0.00	2.37E+02	2.37E+02	2.37E+02	2.37E+02	2.37E+02	2.37E+02	2.36E+02
0.01	2.37E+02	2.37E+02	2.36E+02	2.36E+02	2.36E+02	2.36E+02	2.36E+02
0.02	2.36E+02	2.36E+02	2.36E+02	2.35E+02	2.35E+02	2.34E+02	2.34E+02
0.04	2.34E+02	2.33E+02	2.32E+02	2.31E+02	2.30E+02	2.28E+02	2.27E+02
0.06	2.31E+02	2.28E+02	2.27E+02	2.26E+02	2.22E+02	2.19E+02	2.17E+02
0.10	2.22E+02	2.16E+02	2.14E+02	2.11E+02	2.05E+02	2.00E+02	1.97E+02
0.20	1.95E+02	1.82E+02	1.80E+02	1.72E+02	1.62E+02	1.53E+02	1.48E+02
0.30	1.69E+02	1.51E+02	1.48E+02	1.38E+02	1.24E+02	1.14E+02	1.08E+02
0.40	1.45E+02	1.24E+02	1.19E+02	1.09E+02	9.56E+01	8.63E+01	8.07E+01
0.50	1.23E+02	1.01E+02	9.70E+01	8.71E+01	7.47E+01	6.67E+01	6.22E+01
0.60	1.05E+02	8.36E+01	7.97E+01	7.06E+01	5.95E+01	5.26E+01	4.87E+01
0.70	8.95E+01	6.99E+01	6.64E+01	5.82E+01	4.84E+01	4.22E+01	3.87E+01
0.80	7.71E+01	5.91E+01	5.59E+01	4.86E+01	3.99E+01	3.45E+01	3.14E+01
1.00	5.85E+01	4.35E+01	4.09E+01	3.52E+01	2.86E+01	2.45E+01	2.23E+01
1.20	4.55E+01	3.31E+01	3.11E+01	2.66E+01	2.16E+01	1.86E+01	1.69E+01
1.50	3.28E+01	2.35E+01	2.20E+01	1.87E+01	1.49E+01	1.25E+01	1.10E+01
1.70	2.71E+01	1.94E+01	1.81E+01	1.52E+01	1.17E+01	9.28E+00	7.79E+00
2.00	2.11E+01	1.48E+01	1.38E+01	1.13E+01	8.08E+00	5.83E+00	4.47E+00
2.50	1.44E+01	9.37E+00	8.53E+00	6.63E+00	4.40E+00	3.00E+00	2.22E+00
3.00	9.83E+00	5.72E+00	5.11E+00	3.84E+00	2.62E+00	2.02E+00	1.74E+00
3.50	6.69E+00	3.61E+00	3.20E+00	2.40E+00	1.78E+00	1.61E+00	1.66E+00
4.00	4.65E+00	2.48E+00	2.21E+00	1.70E+00	1.33E+00	1.30E+00	1.42E+00
5.00	2.55E+00	1.54E+00	1.40E+00	1.12E+00	8.33E−01	6.54E−01	5.47E−01
6.00	1.67E+00	1.11E+00	1.03E+00	8.16E−01	5.13E−01	2.88E−01	1.68E−01
7.00	1.20E+00	7.70E−01	6.99E−01	5.29E−01	3.02E−01	1.54E−01	8.33E−02
8.00	8.82E−01	4.95E−01	4.38E−01	3.14E−01	1.82E−01	1.07E−01	6.97E−02
9.00	6.39E−01	3.14E−01	2.71E−01	1.89E−01	1.18E−01	8.76E−02	7.53E−02
10.00	4.58E−01	2.07E−01	1.77E−01	1.23E−01	8.46E−02	7.69E−02	8.27E−02
12.50	2.10E−01	9.84E−02	8.58E−02	6.37E−02	4.98E−02	5.07E−02	5.85E−02
15.00	1.16E−01	6.58E−02	5.96E−02	4.73E−02	3.44E−02	2.58E−02	2.03E−02
17.50	7.59E−02	4.93E−02	4.56E−02	3.65E−02	2.29E−02	1.24E−02	6.76E−03
20.00	5.54E−02	3.61E−02	3.31E−02	2.54E−02	1.40E−02	6.36E−03	2.96E−03
22.50	4.20E−02	2.52E−02	2.24E−02	1.60E−02	8.05E−03	3.51E−03	1.64E−03
25.00	3.20E−02	1.69E−02	1.46E−02	9.65E−03	4.51E−03	2.01E−03	1.01E−03
27.50	2.41E−02	1.11E−02	9.31E−03	5.73E−03	2.53E−03	1.17E−03	6.39E−04
30.00	1.78E−02	7.28E−03	5.93E−03	3.43E−03	1.44E−03	6.81E−04	3.98E−04
35.00	9.42E−03	3.14E−03	2.45E−03	1.28E−03	4.88E−04	2.29E−04	1.41E−04
40.00	4.89E−03	1.40E−03	1.07E−03	5.20E−04	1.84E−04	8.38E−05	5.14E−05
45.00	2.56E−03	6.60E−04	4.92E−04	2.32E−04	7.98E−05	3.67E−05	2.29E−05
50.00	1.37E−03	3.31E−04	2.45E−04	1.14E−04	4.03E−05	1.94E−05	1.27E−05
55.00	7.71E−04	1.80E−04	1.34E−04	6.40E−05	2.47E−05	1.35E−05	9.93E−06
60.00	4.59E−04	1.08E−04	8.14E−05	4.11E−05	1.81E−05	1.16E−05	9.83E−06
65.00	2.93E−04	7.18E−05	5.49E−05	2.94E−05	1.48E−05	1.09E−05	1.03E−05
70.00	2.02E−04	5.28E−05	4.12E−05	2.36E−05	1.33E−05	1.08E−05	1.10E−05
75.00	1.50E−04	4.24E−05	3.38E−05	2.05E−05	1.26E−05	1.10E−05	1.15E−05
80.00	1.19E−04	3.65E−05	2.97E−05	1.90E−05	1.25E−05	1.11E−05	1.16E−05
85.00	9.97E−05	3.30E−05	2.74E−05	1.83E−05	1.26E−05	1.14E−05	1.18E−05
90.00	8.76E−05	3.11E−05	2.62E−05	1.82E−05	1.31E−05	1.19E−05	1.20E−05
95.00	7.94E−05	2.99E−05	2.55E−05	1.82E−05	1.35E−05	1.23E−05	1.23E−05
105.00	7.00E−05	2.90E−05	2.53E−05	1.90E−05	1.48E−05	1.35E−05	1.31E−05
120.00	6.40E−05	2.95E−05	2.62E−05	2.08E−05	1.70E−05	1.54E−05	1.45E−05
135.00	6.23E−05	3.11E−05	2.82E−05	2.32E−05	1.94E−05	1.73E−05	1.56E−05
150.00	6.20E−05	3.27E−05	2.99E−05	2.52E−05	2.15E−05	1.89E−05	1.67E−05
165.00	6.22E−05	3.38E−05	3.12E−05	2.67E−05	2.30E−05	2.02E−05	1.75E−05
180.00	6.23E−05	3.43E−05	3.16E−05	2.72E−05	2.36E−05	2.07E−05	1.79E−05
total	4.76E−01	3.12E−01	2.87E−01	2.35E−01	1.78E−01	1.45E−01	1.29E−01
rel ff	4.95E−01	3.25E−01	2.99E−01	2.44E−01	1.86E−01	1.53E−01	1.35E−01
nrl ff	5.27E−01	3.46E−01	3.19E−01	2.60E−01	1.98E−01	1.63E−01	1.44E−01

TABLE 1. Predicted *S*-matrix differential elastic scattering cross sections for photon energies (50.0, 59.54, 145.4, 316.5, 411.8, 468.1, 661.6, 778.9, 964.0, 1004.8, 1112.1, 1274.5, 1408.0 and 1500.0). The angle integrated total cross sections for each element and energies are presented. ''total'' represents total cross sections from this work, ''rel ff'' represents total cross sections calculated from the relativistic form factor and ''nrl ff'' represents total cross sections calculated from the nonrelativistic form factor—Continued[a]

θ (deg)	Photon energy (keV)						
	50.0	59.5	145.4	316.5	411.8	468.1	661.6
Barium ($Z=56$)							
0.00	2.48E+02	2.48E+02	2.48E+02	2.46E+02	2.46E+02	2.46E+02	2.46E+02
0.01	2.48E+02	2.48E+02	2.48E+02	2.46E+02	2.46E+02	2.46E+02	2.45E+02
0.02	2.49E+02	2.48E+02	2.48E+02	2.46E+02	2.46E+02	2.45E+02	2.45E+02
0.04	2.48E+02	2.48E+02	2.47E+02	2.46E+02	2.45E+02	2.45E+02	2.44E+02
0.06	2.48E+02	2.48E+02	2.47E+02	2.45E+02	2.44E+02	2.43E+02	2.41E+02
0.10	2.48E+02	2.48E+02	2.47E+02	2.43E+02	2.41E+02	2.39E+02	2.34E+02
0.20	2.48E+02	2.48E+02	2.45E+02	2.35E+02	2.29E+02	2.25E+02	2.11E+02
0.30	2.48E+02	2.47E+02	2.42E+02	2.25E+02	2.14E+02	2.08E+02	1.87E+02
0.40	2.47E+02	2.47E+02	2.38E+02	2.13E+02	2.00E+02	1.91E+02	1.65E+02
0.50	2.47E+02	2.46E+02	2.34E+02	2.02E+02	1.85E+02	1.75E+02	1.44E+02
0.60	2.46E+02	2.45E+02	2.29E+02	1.91E+02	1.71E+02	1.60E+02	1.26E+02
0.70	2.45E+02	2.43E+02	2.24E+02	1.80E+02	1.58E+02	1.45E+02	1.10E+02
0.80	2.44E+02	2.42E+02	2.18E+02	1.69E+02	1.45E+02	1.32E+02	9.61E+01
1.00	2.42E+02	2.39E+02	2.08E+02	1.49E+02	1.22E+02	1.09E+02	7.50E+01
1.20	2.39E+02	2.35E+02	1.97E+02	1.31E+02	1.03E+02	9.04E+01	5.97E+01
1.50	2.34E+02	2.29E+02	1.82E+02	1.08E+02	8.14E+01	6.98E+01	4.36E+01
1.70	2.30E+02	2.25E+02	1.72E+02	9.49E+01	7.02E+01	5.95E+01	3.61E+01
2.00	2.25E+02	2.18E+02	1.58E+02	7.93E+01	5.69E+01	4.76E+01	2.81E+01
2.50	2.17E+02	2.07E+02	1.36E+02	6.00E+01	4.14E+01	3.42E+01	1.99E+01
3.00	2.08E+02	1.96E+02	1.17E+02	4.67E+01	3.13E+01	2.57E+01	1.47E+01
3.50	2.00E+02	1.86E+02	1.01E+02	3.72E+01	2.47E+01	2.01E+01	1.08E+01
4.00	1.91E+02	1.76E+02	8.76E+01	3.04E+01	2.01E+01	1.60E+01	7.76E+00
5.00	1.74E+02	1.56E+02	6.74E+01	2.13E+01	1.38E+01	1.04E+01	4.12E+00
6.00	1.56E+02	1.38E+02	5.29E+01	1.56E+01	9.28E+00	6.73E+00	2.50E+00
7.00	1.41E+02	1.22E+02	4.24E+01	1.16E+01	6.16E+00	4.42E+00	1.78E+00
8.00	1.26E+02	1.07E+02	3.46E+01	8.64E+00	4.18E+00	3.02E+00	1.38E+00
9.00	1.13E+02	9.54E+01	2.88E+01	6.44E+00	3.00E+00	2.19E+00	1.08E+00
10.00	1.01E+02	8.50E+01	2.45E+01	4.85E+00	2.30E+00	1.69E+00	8.25E−01
12.50	7.63E+01	6.49E+01	1.72E+01	2.62E+00	1.45E+00	1.05E+00	3.98E−01
15.00	5.97E+01	5.05E+01	1.23E+01	1.66E+00	9.84E−01	6.81E−01	2.03E−01
17.50	4.87E+01	4.01E+01	8.58E+00	1.17E+00	6.36E−01	4.25E−01	1.22E−01
20.00	4.10E+01	3.24E+01	5.96E+00	8.59E−01	4.01E−01	2.64E−01	8.48E−02
22.50	3.51E+01	2.67E+01	4.22E+00	6.30E−01	2.58E−01	1.71E−01	6.47E−02
25.00	3.03E+01	2.25E+01	3.10E+00	4.57E−01	1.75E−01	1.18E−01	5.12E−02
27.50	2.62E+01	1.92E+01	2.40E+00	3.31E−01	1.26E−01	8.69E−02	4.07E−02
30.00	2.26E+01	1.64E+01	1.94E+00	2.42E−01	9.70E−02	6.78E−02	3.21E−02
35.00	1.65E+01	1.22E+01	1.38E+00	1.38E−01	6.49E−02	4.62E−02	1.93E−02
40.00	1.19E+01	8.94E+00	1.02E+00	8.73E−02	4.71E−02	3.32E−02	1.13E−02
45.00	8.58E+00	6.49E+00	7.50E−01	6.06E−02	3.47E−02	2.39E−02	6.52E−03
50.00	6.26E+00	4.72E+00	5.39E−01	4.51E−02	2.54E−02	1.68E−02	3.80E−03
55.00	4.69E+00	3.48E+00	3.84E−01	3.49E−02	1.85E−02	1.18E−02	2.27E−03
60.00	3.62E+00	2.64E+00	2.77E−01	2.77E−02	1.35E−02	8.21E−03	1.40E−03
65.00	2.90E+00	2.07E+00	2.04E−01	2.23E−02	9.93E−03	5.82E−03	9.10E−04
70.00	2.41E+00	1.68E+00	1.55E−01	1.82E−02	7.43E−03	4.22E−03	6.23E−04
75.00	2.07E+00	1.42E+00	1.23E−01	1.51E−02	5.71E−03	3.16E−03	4.52E−04
80.00	1.83E+00	1.24E+00	1.01E−01	1.27E−02	4.51E−03	2.45E−03	3.48E−04
85.00	1.66E+00	1.11E+00	8.70E−02	1.09E−02	3.68E−03	1.97E−03	2.82E−04
90.00	1.55E+00	1.03E+00	7.76E−02	9.60E−03	3.10E−03	1.64E−03	2.40E−04
95.00	1.48E+00	9.76E−01	7.16E−02	8.61E−03	2.69E−03	1.42E−03	2.11E−04
105.00	1.41E+00	9.27E−01	6.60E−02	7.31E−03	2.17E−03	1.14E−03	1.77E−04
120.00	1.42E+00	9.40E−01	6.60E−02	6.31E−03	1.78E−03	9.26E−04	1.52E−04
135.00	1.49E+00	9.93E−01	6.97E−02	5.81E−03	1.59E−03	8.22E−04	1.41E−04
150.00	1.56E+00	1.05E+00	7.38E−02	5.53E−03	1.48E−03	7.66E−04	1.36E−04
165.00	1.62E+00	1.09E+00	7.68E−02	5.39E−03	1.43E−03	7.37E−04	1.33E−04
180.00	1.64E+00	1.10E+00	7.78E−02	5.34E−03	1.41E−03	7.28E−04	1.33E−04
total	8.28E+01	6.42E+01	1.31E+01	2.95E+00	1.77E+00	1.37E+00	6.93E−01
rel ff	8.03E+01	6.07E+01	1.27E+01	2.98E+00	1.80E+00	1.41E+00	7.15E−01
nrl ff	8.31E+01	6.30E+01	1.34E+01	3.17E+00	1.92E+00	1.50E+00	7.62E−01

TABLE 1. Predicted *S*-matrix differential elastic scattering cross sections for photon energies (50.0, 59.54, 145.4, 316.5, 411.8, 468.1, 661.6, 778.9, 964.0, 1004.8, 1112.1, 1274.5, 1408.0 and 1500.0). The angle integrated total cross sections for each element and energies are presented. ''total'' represents total cross sections from this work, ''rel ff'' represents total cross sections calculated from the relativistic form factor and ''nrl ff'' represents total cross sections calculated from the nonrelativistic form factor—Continued[a]

θ (deg)	Photon energy (keV)						
	778.9	964.0	1004.8	1112.1	1274.5	1408.0	1500.0
Barium ($Z=56$)							
0.00	2.46E+02	2.45E+02	2.45E+02	2.45E+02	2.45E+02	2.45E+02	2.45E+02
0.01	2.45E+02	2.45E+02	2.45E+02	2.45E+02	2.45E+02	2.45E+02	2.44E+02
0.02	2.45E+02	2.44E+02	2.44E+02	2.44E+02	2.43E+02	2.43E+02	2.42E+02
0.04	2.43E+02	2.41E+02	2.41E+02	2.40E+02	2.38E+02	2.36E+02	2.35E+02
0.06	2.39E+02	2.36E+02	2.36E+02	2.34E+02	2.30E+02	2.27E+02	2.25E+02
0.10	2.30E+02	2.24E+02	2.22E+02	2.18E+02	2.12E+02	2.07E+02	2.04E+02
0.20	2.02E+02	1.89E+02	1.86E+02	1.79E+02	1.68E+02	1.59E+02	1.54E+02
0.30	1.75E+02	1.57E+02	1.53E+02	1.43E+02	1.29E+02	1.19E+02	1.12E+02
0.40	1.50E+02	1.28E+02	1.24E+02	1.13E+02	9.94E+01	8.98E+01	8.42E+01
0.50	1.28E+02	1.05E+02	1.01E+02	9.06E+01	7.79E+01	6.97E+01	6.51E+01
0.60	1.09E+02	8.71E+01	8.31E+01	7.36E+01	6.22E+01	5.50E+01	5.10E+01
0.70	9.31E+01	7.30E+01	6.93E+01	6.08E+01	5.06E+01	4.40E+01	4.03E+01
0.80	8.04E+01	6.18E+01	5.85E+01	5.08E+01	4.17E+01	3.58E+01	3.25E+01
1.00	6.11E+01	4.54E+01	4.28E+01	3.67E+01	2.97E+01	2.53E+01	2.29E+01
1.20	4.75E+01	3.45E+01	3.23E+01	2.76E+01	2.23E+01	1.92E+01	1.76E+01
1.50	3.41E+01	2.43E+01	2.28E+01	1.93E+01	1.55E+01	1.32E+01	1.19E+01
1.70	2.81E+01	2.01E+01	1.87E+01	1.58E+01	1.23E+01	9.93E+00	8.50E+00
2.00	2.18E+01	1.55E+01	1.44E+01	1.18E+01	8.59E+00	6.26E+00	4.84E+00
2.50	1.50E+01	9.95E+00	9.09E+00	7.11E+00	4.70E+00	3.15E+00	2.28E+00
3.00	1.04E+01	6.14E+00	5.49E+00	4.13E+00	2.77E+00	2.06E+00	1.71E+00
3.50	7.13E+00	3.85E+00	3.41E+00	2.55E+00	1.86E+00	1.65E+00	1.67E+00
4.00	4.95E+00	2.61E+00	2.31E+00	1.76E+00	1.38E+00	1.36E+00	1.52E+00
5.00	2.69E+00	1.59E+00	1.44E+00	1.15E+00	8.69E−01	7.15E−01	6.31E−01
6.00	1.74E+00	1.16E+00	1.07E+00	8.55E−01	5.46E−01	3.14E−01	1.86E−01
7.00	1.25E+00	8.18E−01	7.46E−01	5.70E−01	3.25E−01	1.63E−01	8.59E−02
8.00	9.27E−01	5.34E−01	4.74E−01	3.42E−01	1.95E−01	1.10E−01	6.83E−02
9.00	6.78E−01	3.40E−01	2.94E−01	2.05E−01	1.26E−01	8.90E−02	7.27E−02
10.00	4.89E−01	2.23E−01	1.91E−01	1.32E−01	8.89E−02	7.82E−02	8.14E−02
12.50	2.24E−01	1.03E−01	8.93E−02	6.57E−02	5.13E−02	5.32E−02	6.33E−02
15.00	1.22E−01	6.77E−02	6.11E−02	4.82E−02	3.55E−02	2.78E−02	2.31E−02
17.50	7.91E−02	5.09E−02	4.70E−02	3.77E−02	2.41E−02	1.34E−02	7.57E−03
20.00	5.74E−02	3.77E−02	3.46E−02	2.68E−02	1.50E−02	6.88E−03	3.22E−03
22.50	4.36E−02	2.66E−02	2.38E−02	1.73E−02	8.77E−03	3.81E−03	1.76E−03
25.00	3.34E−02	1.80E−02	1.57E−02	1.05E−02	4.97E−03	2.20E−03	1.09E−03
27.50	2.53E−02	1.20E−02	1.01E−02	6.30E−03	2.81E−03	1.28E−03	6.91E−04
30.00	1.89E−02	7.91E−03	6.49E−03	3.79E−03	1.61E−03	7.55E−04	4.35E−04
35.00	1.01E−02	3.46E−03	2.71E−03	1.43E−03	5.49E−04	2.58E−04	1.57E−04
40.00	5.33E−03	1.56E−03	1.19E−03	5.83E−04	2.08E−04	9.49E−05	5.82E−05
45.00	2.81E−03	7.38E−04	5.52E−04	2.61E−04	9.02E−05	4.15E−05	2.59E−05
50.00	1.52E−03	3.72E−04	2.75E−04	1.29E−04	4.53E−05	2.18E−05	1.43E−05
55.00	8.59E−04	2.03E−04	1.50E−04	7.20E−05	2.76E−05	1.50E−05	1.10E−05
60.00	5.14E−04	1.22E−04	9.16E−05	4.61E−05	2.01E−05	1.28E−05	1.07E−05
65.00	3.29E−04	8.07E−05	6.16E−05	3.29E−05	1.63E−05	1.19E−05	1.12E−05
70.00	2.27E−04	5.93E−05	4.62E−05	2.62E−05	1.46E−05	1.18E−05	1.19E−05
75.00	1.68E−04	4.75E−05	3.78E−05	2.28E−05	1.38E−05	1.19E−05	1.24E−05
80.00	1.34E−04	4.08E−05	3.31E−05	2.10E−05	1.36E−05	1.20E−05	1.25E−05
85.00	1.12E−04	3.68E−05	3.04E−05	2.01E−05	1.37E−05	1.23E−05	1.27E−05
90.00	9.83E−05	3.45E−05	2.90E−05	1.99E−05	1.41E−05	1.28E−05	1.29E−05
95.00	8.90E−05	3.31E−05	2.81E−05	1.99E−05	1.46E−05	1.32E−05	1.32E−05
105.00	7.84E−05	3.20E−05	2.78E−05	2.07E−05	1.59E−05	1.44E−05	1.40E−05
120.00	7.13E−05	3.23E−05	2.86E−05	2.24E−05	1.81E−05	1.64E−05	1.55E−05
135.00	6.91E−05	3.39E−05	3.05E−05	2.48E−05	2.06E−05	1.84E−05	1.67E−05
150.00	6.86E−05	3.54E−05	3.23E−05	2.69E−05	2.27E−05	2.01E−05	1.79E−05
165.00	6.87E−05	3.66E−05	3.36E−05	2.84E−05	2.43E−05	2.14E−05	1.88E−05
180.00	6.87E−05	3.71E−05	3.41E−05	2.90E−05	2.49E−05	2.19E−05	1.92E−05
total	4.99E−01	3.27E−01	3.01E−01	2.46E−01	1.86E−01	1.52E−01	1.35E−01
rel ff	5.19E−01	3.40E−01	3.14E−01	2.56E−01	1.95E−01	1.60E−01	1.42E−01
nrl ff	5.54E−01	3.63E−01	3.35E−01	2.73E−01	2.08E−01	1.71E−01	1.51E−01

TABLE 1. Predicted *S*-matrix differential elastic scattering cross sections for photon energies (50.0, 59.54, 145.4, 316.5, 411.8, 468.1, 661.6, 778.9, 964.0, 1004.8, 1112.1, 1274.5, 1408.0 and 1500.0). The angle integrated total cross sections for each element and energies are presented. ''total'' represents total cross sections from this work, ''rel ff'' represents total cross sections calculated from the relativistic form factor and ''nrl ff'' represents total cross sections calculated from the nonrelativistic form factor—Continued[a]

θ (deg)	Photon energy (keV)						
	50.0	59.5	145.4	316.5	411.8	468.1	661.6
Lawrencium ($Z=57$)							
0.00	2.57E+02	2.57E+02	2.57E+02	2.55E+02	2.55E+02	2.55E+02	2.54E+02
0.01	2.57E+02	2.57E+02	2.57E+02	2.55E+02	2.55E+02	2.54E+02	2.54E+02
0.02	2.57E+02	2.57E+02	2.56E+02	2.55E+02	2.54E+02	2.54E+02	2.54E+02
0.04	2.57E+02	2.57E+02	2.56E+02	2.54E+02	2.54E+02	2.54E+02	2.52E+02
0.06	2.57E+02	2.57E+02	2.56E+02	2.54E+02	2.53E+02	2.52E+02	2.50E+02
0.10	2.57E+02	2.57E+02	2.56E+02	2.52E+02	2.49E+02	2.48E+02	2.42E+02
0.20	2.57E+02	2.57E+02	2.54E+02	2.44E+02	2.37E+02	2.33E+02	2.18E+02
0.30	2.56E+02	2.56E+02	2.51E+02	2.33E+02	2.22E+02	2.16E+02	1.94E+02
0.40	2.56E+02	2.55E+02	2.47E+02	2.21E+02	2.07E+02	1.98E+02	1.71E+02
0.50	2.55E+02	2.54E+02	2.42E+02	2.09E+02	1.92E+02	1.82E+02	1.50E+02
0.60	2.54E+02	2.53E+02	2.37E+02	1.98E+02	1.78E+02	1.66E+02	1.31E+02
0.70	2.53E+02	2.52E+02	2.32E+02	1.87E+02	1.64E+02	1.51E+02	1.14E+02
0.80	2.52E+02	2.50E+02	2.26E+02	1.75E+02	1.50E+02	1.37E+02	1.00E+02
1.00	2.50E+02	2.47E+02	2.15E+02	1.55E+02	1.27E+02	1.13E+02	7.83E+01
1.20	2.47E+02	2.43E+02	2.04E+02	1.36E+02	1.07E+02	9.42E+01	6.24E+01
1.50	2.42E+02	2.37E+02	1.89E+02	1.12E+02	8.49E+01	7.29E+01	4.55E+01
1.70	2.38E+02	2.32E+02	1.79E+02	9.88E+01	7.33E+01	6.22E+01	3.76E+01
2.00	2.33E+02	2.25E+02	1.64E+02	8.27E+01	5.95E+01	4.97E+01	2.92E+01
2.50	2.24E+02	2.14E+02	1.41E+02	6.27E+01	4.32E+01	3.56E+01	2.07E+01
3.00	2.15E+02	2.03E+02	1.21E+02	4.88E+01	3.26E+01	2.67E+01	1.54E+01
3.50	2.07E+02	1.93E+02	1.05E+02	3.88E+01	2.56E+01	2.08E+01	1.14E+01
4.00	1.98E+02	1.82E+02	9.13E+01	3.16E+01	2.08E+01	1.66E+01	8.26E+00
5.00	1.79E+02	1.62E+02	7.04E+01	2.21E+01	1.44E+01	1.09E+01	4.37E+00
6.00	1.62E+02	1.43E+02	5.53E+01	1.63E+01	9.83E+00	7.15E+00	2.62E+00
7.00	1.46E+02	1.26E+02	4.42E+01	1.22E+01	6.56E+00	4.70E+00	1.85E+00
8.00	1.31E+02	1.11E+02	3.60E+01	9.13E+00	4.44E+00	3.20E+00	1.43E+00
9.00	1.17E+02	9.91E+01	2.99E+01	6.83E+00	3.16E+00	2.31E+00	1.13E+00
10.00	1.05E+02	8.84E+01	2.54E+01	5.15E+00	2.40E+00	1.76E+00	8.72E−01
12.50	7.96E+01	6.76E+01	1.79E+01	2.77E+00	1.51E+00	1.09E+00	4.27E−01
15.00	6.21E+01	5.26E+01	1.29E+01	1.73E+00	1.03E+00	7.19E−01	2.17E−01
17.50	5.03E+01	4.16E+01	9.11E+00	1.22E+00	6.77E−01	4.54E−01	1.28E−01
20.00	4.21E+01	3.36E+01	6.35E+00	9.01E−01	4.30E−01	2.83E−01	8.83E−02
22.50	3.60E+01	2.76E+01	4.48E+00	6.65E−01	2.77E−01	1.83E−01	6.70E−02
25.00	3.11E+01	2.32E+01	3.28E+00	4.86E−01	1.86E−01	1.25E−01	5.30E−02
27.50	2.70E+01	1.97E+01	2.51E+00	3.53E−01	1.34E−01	9.14E−02	4.23E−02
30.00	2.33E+01	1.70E+01	2.02E+00	2.59E−01	1.02E−01	7.08E−02	3.35E−02
35.00	1.72E+01	1.27E+01	1.44E+00	1.47E−01	6.74E−02	4.78E−02	2.04E−02
40.00	1.25E+01	9.37E+00	1.07E+00	9.22E−02	4.88E−02	3.45E−02	1.21E−02
45.00	9.04E+00	6.84E+00	7.91E−01	6.35E−02	3.61E−02	2.50E−02	7.05E−03
50.00	6.59E+00	4.98E+00	5.73E−01	4.69E−02	2.66E−02	1.78E−02	4.14E−03
55.00	4.91E+00	3.67E+00	4.12E−01	3.63E−02	1.95E−02	1.25E−02	2.49E−03
60.00	3.77E+00	2.77E+00	2.97E−01	2.88E−02	1.43E−02	8.81E−03	1.55E−03
65.00	3.00E+00	2.16E+00	2.19E−01	2.33E−02	1.06E−02	6.28E−03	1.01E−03
70.00	2.47E+00	1.74E+00	1.66E−01	1.91E−02	8.00E−03	4.58E−03	6.94E−04
75.00	2.11E+00	1.46E+00	1.31E−01	1.59E−02	6.17E−03	3.45E−03	5.05E−04
80.00	1.86E+00	1.27E+00	1.08E−01	1.34E−02	4.90E−03	2.69E−03	3.90E−04
85.00	1.69E+00	1.14E+00	9.23E−02	1.16E−02	4.02E−03	2.17E−03	3.16E−04
90.00	1.58E+00	1.06E+00	8.21E−02	1.03E−02	3.40E−03	1.82E−03	2.69E−04
95.00	1.50E+00	9.99E−01	7.55E−02	9.25E−03	2.96E−03	1.57E−03	2.37E−04
105.00	1.44E+00	9.50E−01	6.93E−02	7.91E−03	2.40E−03	1.26E−03	1.98E−04
120.00	1.46E+00	9.66E−01	6.91E−02	6.88E−03	1.98E−03	1.03E−03	1.70E−04
135.00	1.54E+00	1.03E+00	7.29E−02	6.37E−03	1.77E−03	9.20E−04	1.58E−04
150.00	1.62E+00	1.09E+00	7.73E−02	6.08E−03	1.65E−03	8.58E−04	1.51E−04
165.00	1.68E+00	1.13E+00	8.04E−02	5.93E−03	1.59E−03	8.26E−04	1.49E−04
180.00	1.70E+00	1.15E+00	8.15E−02	5.88E−03	1.57E−03	8.16E−04	1.48E−04
total	8.58E+01	6.67E+01	1.37E+01	3.10E+00	1.85E+00	1.44E+00	7.26E−01
rel ff	8.37E+01	6.33E+01	1.33E+01	3.12E+00	1.89E+00	1.47E+00	7.49E−01
nrl ff	8.67E+01	6.58E+01	1.40E+01	3.32E+00	2.01E+00	1.57E+00	8.00E−01

TABLE 1. Predicted *S*-matrix differential elastic scattering cross sections for photon energies (50.0, 59.54, 145.4, 316.5, 411.8, 468.1, 661.6, 778.9, 964.0, 1004.8, 1112.1, 1274.5, 1408.0 and 1500.0). The angle integrated total cross sections for each element and energies are presented. ''total'' represents total cross sections from this work, ''rel ff'' represents total cross sections calculated from the relativistic form factor and ''nrl ff'' represents total cross sections calculated from the nonrelativistic form factor—Continued[a]

θ (deg)	Photon energy (keV)						
	778.9	964.0	1004.8	1112.1	1274.5	1408.0	1500.0
Lawrencium ($Z=57$)							
0.00	2.54E+02	2.54E+02	2.54E+02	2.54E+02	2.54E+02	2.54E+02	2.54E+02
0.01	2.54E+02	2.54E+02	2.54E+02	2.54E+02	2.54E+02	2.53E+02	2.53E+02
0.02	2.54E+02	2.53E+02	2.53E+02	2.53E+02	2.52E+02	2.51E+02	2.51E+02
0.04	2.51E+02	2.50E+02	2.49E+02	2.48E+02	2.46E+02	2.45E+02	2.44E+02
0.06	2.48E+02	2.45E+02	2.44E+02	2.42E+02	2.38E+02	2.35E+02	2.33E+02
0.10	2.38E+02	2.31E+02	2.30E+02	2.26E+02	2.20E+02	2.15E+02	2.12E+02
0.20	2.10E+02	1.96E+02	1.93E+02	1.85E+02	1.74E+02	1.65E+02	1.59E+02
0.30	1.82E+02	1.63E+02	1.59E+02	1.49E+02	1.34E+02	1.23E+02	1.16E+02
0.40	1.56E+02	1.33E+02	1.29E+02	1.18E+02	1.03E+02	9.36E+01	8.78E+01
0.50	1.33E+02	1.09E+02	1.05E+02	9.43E+01	8.12E+01	7.28E+01	6.81E+01
0.60	1.13E+02	9.07E+01	8.66E+01	7.68E+01	6.50E+01	5.75E+01	5.33E+01
0.70	9.70E+01	7.62E+01	7.24E+01	6.35E+01	5.28E+01	4.59E+01	4.20E+01
0.80	8.38E+01	6.46E+01	6.11E+01	5.32E+01	4.35E+01	3.73E+01	3.37E+01
1.00	6.38E+01	4.75E+01	4.47E+01	3.83E+01	3.08E+01	2.62E+01	2.35E+01
1.20	4.96E+01	3.59E+01	3.36E+01	2.86E+01	2.31E+01	1.99E+01	1.83E+01
1.50	3.55E+01	2.52E+01	2.35E+01	2.00E+01	1.61E+01	1.39E+01	1.27E+01
1.70	2.92E+01	2.08E+01	1.94E+01	1.64E+01	1.29E+01	1.06E+01	9.21E+00
2.00	2.26E+01	1.61E+01	1.50E+01	1.24E+01	9.10E+00	6.71E+00	5.24E+00
2.50	1.57E+01	1.05E+01	9.66E+00	7.60E+00	5.02E+00	3.31E+00	2.35E+00
3.00	1.10E+01	6.56E+00	5.88E+00	4.43E+00	2.93E+00	2.12E+00	1.70E+00
3.50	7.57E+00	4.10E+00	3.63E+00	2.70E+00	1.94E+00	1.69E+00	1.68E+00
4.00	5.26E+00	2.75E+00	2.43E+00	1.84E+00	1.43E+00	1.42E+00	1.60E+00
5.00	2.83E+00	1.64E+00	1.48E+00	1.18E+00	9.06E−01	7.77E−01	7.18E−01
6.00	1.82E+00	1.21E+00	1.11E+00	8.93E−01	5.79E−01	3.41E−01	2.07E−01
7.00	1.31E+00	8.65E−01	7.92E−01	6.10E−01	3.49E−01	1.73E−01	8.96E−02
8.00	9.72E−01	5.72E−01	5.10E−01	3.71E−01	2.10E−01	1.14E−01	6.77E−02
9.00	7.17E−01	3.67E−01	3.18E−01	2.22E−01	1.34E−01	9.08E−02	7.07E−02
10.00	5.21E−01	2.40E−01	2.05E−01	1.42E−01	9.36E−02	7.97E−02	8.01E−02
12.50	2.39E−01	1.08E−01	9.33E−02	6.80E−02	5.29E−02	5.57E−02	6.78E−02
15.00	1.29E−01	6.98E−02	6.27E−02	4.92E−02	3.67E−02	2.99E−02	2.59E−02
17.50	8.26E−02	5.25E−02	4.84E−02	3.89E−02	2.52E−02	1.45E−02	8.46E−03
20.00	5.95E−02	3.93E−02	3.61E−02	2.82E−02	1.60E−02	7.45E−03	3.52E−03
22.50	4.53E−02	2.80E−02	2.52E−02	1.85E−02	9.50E−03	4.13E−03	1.89E−03
25.00	3.48E−02	1.92E−02	1.68E−02	1.14E−02	5.45E−03	2.39E−03	1.16E−03
27.50	2.65E−02	1.29E−02	1.09E−02	6.90E−03	3.11E−03	1.41E−03	7.45E−04
30.00	2.00E−02	8.57E−03	7.07E−03	4.18E−03	1.79E−03	8.35E−04	4.74E−04
35.00	1.09E−02	3.79E−03	2.99E−03	1.59E−03	6.16E−04	2.89E−04	1.75E−04
40.00	5.78E−03	1.73E−03	1.32E−03	6.53E−04	2.34E−04	1.07E−04	6.55E−05
45.00	3.08E−03	8.22E−04	6.16E−04	2.93E−04	1.02E−04	4.68E−05	2.92E−05
50.00	1.68E−03	4.16E−04	3.09E−04	1.45E−04	5.10E−05	2.44E−05	1.59E−05
55.00	9.55E−04	2.27E−04	1.69E−04	8.08E−05	3.09E−05	1.66E−05	1.21E−05
60.00	5.73E−04	1.37E−04	1.03E−04	5.16E−05	2.24E−05	1.41E−05	1.17E−05
65.00	3.68E−04	9.05E−05	6.91E−05	3.67E−05	1.81E−05	1.30E−05	1.21E−05
70.00	2.54E−04	6.64E−05	5.17E−05	2.92E−05	1.60E−05	1.28E−05	1.28E−05
75.00	1.89E−04	5.30E−05	4.21E−05	2.52E−05	1.52E−05	1.29E−05	1.34E−05
80.00	1.50E−04	4.55E−05	3.68E−05	2.32E−05	1.48E−05	1.30E−05	1.34E−05
85.00	1.26E−04	4.09E−05	3.37E−05	2.21E−05	1.49E−05	1.33E−05	1.37E−05
90.00	1.10E−04	3.83E−05	3.20E−05	2.18E−05	1.53E−05	1.37E−05	1.39E−05
95.00	9.97E−05	3.66E−05	3.10E−05	2.18E−05	1.58E−05	1.42E−05	1.42E−05
105.00	8.75E−05	3.53E−05	3.05E−05	2.25E−05	1.71E−05	1.54E−05	1.50E−05
120.00	7.94E−05	3.53E−05	3.12E−05	2.42E−05	1.93E−05	1.75E−05	1.66E−05
135.00	7.66E−05	3.69E−05	3.31E−05	2.67E−05	2.19E−05	1.96E−05	1.79E−05
150.00	7.58E−05	3.84E−05	3.48E−05	2.88E−05	2.41E−05	2.13E−05	1.91E−05
165.00	7.58E−05	3.96E−05	3.62E−05	3.03E−05	2.57E−05	2.27E−05	2.01E−05
180.00	7.58E−05	4.01E−05	3.67E−05	3.09E−05	2.63E−05	2.32E−05	2.05E−05
total	5.23E−01	3.43E−01	3.16E−01	2.58E−01	1.95E−01	1.59E−01	1.42E−01
rel ff	5.44E−01	3.57E−01	3.29E−01	2.68E−01	2.04E−01	1.68E−01	1.48E−01
nrl ff	5.81E−01	3.82E−01	3.52E−01	2.87E−01	2.19E−01	1.80E−01	1.59E−01

TABLE 1. Predicted *S*-matrix differential elastic scattering cross sections for photon energies (50.0, 59.54, 145.4, 316.5, 411.8, 468.1, 661.6, 778.9, 964.0, 1004.8, 1112.1, 1274.5, 1408.0 and 1500.0). The angle integrated total cross sections for each element and energies are presented. ''total'' represents total cross sections from this work, ''rel ff'' represents total cross sections calculated from the relativistic form factor and ''nrl ff'' represents total cross sections calculated from the nonrelativistic form factor—Continued[a]

θ (deg)	Photon energy (keV)						
	50.0	59.5	145.4	316.5	411.8	468.1	661.6
Cerium ($Z=58$)							
0.00	2.65E+02	2.65E+02	2.66E+02	2.64E+02	2.64E+02	2.64E+02	2.63E+02
0.01	2.65E+02	2.65E+02	2.66E+02	2.64E+02	2.63E+02	2.63E+02	2.63E+02
0.02	2.65E+02	2.65E+02	2.65E+02	2.64E+02	2.63E+02	2.63E+02	2.63E+02
0.04	2.65E+02	2.65E+02	2.65E+02	2.63E+02	2.63E+02	2.63E+02	2.61E+02
0.06	2.65E+02	2.65E+02	2.65E+02	2.63E+02	2.62E+02	2.61E+02	2.58E+02
0.10	2.65E+02	2.65E+02	2.65E+02	2.61E+02	2.58E+02	2.57E+02	2.51E+02
0.20	2.65E+02	2.65E+02	2.63E+02	2.52E+02	2.45E+02	2.41E+02	2.26E+02
0.30	2.65E+02	2.64E+02	2.59E+02	2.41E+02	2.30E+02	2.23E+02	2.01E+02
0.40	2.64E+02	2.64E+02	2.55E+02	2.29E+02	2.14E+02	2.06E+02	1.78E+02
0.50	2.63E+02	2.63E+02	2.51E+02	2.17E+02	1.99E+02	1.89E+02	1.55E+02
0.60	2.63E+02	2.61E+02	2.45E+02	2.05E+02	1.84E+02	1.72E+02	1.36E+02
0.70	2.62E+02	2.60E+02	2.40E+02	1.93E+02	1.70E+02	1.57E+02	1.19E+02
0.80	2.61E+02	2.58E+02	2.34E+02	1.82E+02	1.56E+02	1.42E+02	1.04E+02
1.00	2.58E+02	2.55E+02	2.23E+02	1.61E+02	1.32E+02	1.18E+02	8.17E+01
1.20	2.55E+02	2.51E+02	2.12E+02	1.41E+02	1.12E+02	9.81E+01	6.52E+01
1.50	2.50E+02	2.44E+02	1.96E+02	1.16E+02	8.85E+01	7.61E+01	4.75E+01
1.70	2.46E+02	2.40E+02	1.85E+02	1.03E+02	7.65E+01	6.49E+01	3.92E+01
2.00	2.40E+02	2.33E+02	1.70E+02	8.62E+01	6.22E+01	5.19E+01	3.03E+01
2.50	2.31E+02	2.21E+02	1.46E+02	6.55E+01	4.51E+01	3.71E+01	2.14E+01
3.00	2.23E+02	2.10E+02	1.26E+02	5.09E+01	3.38E+01	2.77E+01	1.60E+01
3.50	2.14E+02	1.99E+02	1.09E+02	4.04E+01	2.65E+01	2.16E+01	1.20E+01
4.00	2.04E+02	1.88E+02	9.51E+01	3.28E+01	2.16E+01	1.73E+01	8.76E+00
5.00	1.85E+02	1.67E+02	7.36E+01	2.29E+01	1.51E+01	1.15E+01	4.64E+00
6.00	1.67E+02	1.48E+02	5.78E+01	1.69E+01	1.04E+01	7.56E+00	2.75E+00
7.00	1.51E+02	1.31E+02	4.62E+01	1.28E+01	6.98E+00	4.99E+00	1.92E+00
8.00	1.36E+02	1.16E+02	3.75E+01	9.62E+00	4.72E+00	3.39E+00	1.49E+00
9.00	1.22E+02	1.03E+02	3.11E+01	7.23E+00	3.34E+00	2.42E+00	1.18E+00
10.00	1.09E+02	9.19E+01	2.63E+01	5.46E+00	2.52E+00	1.84E+00	9.18E−01
12.50	8.30E+01	7.04E+01	1.86E+01	2.92E+00	1.57E+00	1.14E+00	4.56E−01
15.00	6.45E+01	5.48E+01	1.35E+01	1.81E+00	1.08E+00	7.57E−01	2.31E−01
17.50	5.20E+01	4.32E+01	9.64E+00	1.27E+00	7.18E−01	4.82E−01	1.35E−01
20.00	4.33E+01	3.47E+01	6.75E+00	9.44E−01	4.60E−01	3.03E−01	9.21E−02
22.50	3.69E+01	2.85E+01	4.76E+00	7.01E−01	2.96E−01	1.95E−01	6.95E−02
25.00	3.19E+01	2.39E+01	3.47E+00	5.15E−01	1.99E−01	1.33E−01	5.49E−02
27.50	2.77E+01	2.03E+01	2.64E+00	3.76E−01	1.41E−01	9.62E−02	4.39E−02
30.00	2.40E+01	1.75E+01	2.11E+00	2.76E−01	1.07E−01	7.40E−02	3.50E−02
35.00	1.79E+01	1.31E+01	1.49E+00	1.56E−01	7.01E−02	4.96E−02	2.16E−02
40.00	1.31E+01	9.78E+00	1.12E+00	9.73E−02	5.06E−02	3.58E−02	1.29E−02
45.00	9.48E+00	7.17E+00	8.32E−01	6.65E−02	3.75E−02	2.61E−02	7.60E−03
50.00	6.91E+00	5.23E+00	6.08E−01	4.89E−02	2.78E−02	1.87E−02	4.51E−03
55.00	5.13E+00	3.85E+00	4.39E−01	3.78E−02	2.06E−02	1.33E−02	2.73E−03
60.00	3.92E+00	2.89E+00	3.18E−01	3.00E−02	1.52E−02	9.42E−03	1.71E−03
65.00	3.09E+00	2.24E+00	2.35E−01	2.43E−02	1.13E−02	6.77E−03	1.12E−03
70.00	2.54E+00	1.81E+00	1.78E−01	2.00E−02	8.58E−03	4.97E−03	7.70E−04
75.00	2.16E+00	1.51E+00	1.40E−01	1.67E−02	6.66E−03	3.76E−03	5.63E−04
80.00	1.90E+00	1.30E+00	1.15E−01	1.42E−02	5.32E−03	2.94E−03	4.35E−04
85.00	1.72E+00	1.17E+00	9.79E−02	1.24E−02	4.37E−03	2.39E−03	3.53E−04
90.00	1.60E+00	1.08E+00	8.68E−02	1.10E−02	3.71E−03	2.00E−03	3.01E−04
95.00	1.52E+00	1.02E+00	7.97E−02	9.91E−03	3.24E−03	1.74E−03	2.65E−04
105.00	1.46E+00	9.68E−01	7.29E−02	8.54E−03	2.64E−03	1.40E−03	2.22E−04
120.00	1.48E+00	9.87E−01	7.23E−02	7.47E−03	2.19E−03	1.15E−03	1.91E−04
135.00	1.57E+00	1.05E+00	7.63E−02	6.95E−03	1.96E−03	1.03E−03	1.76E−04
150.00	1.66E+00	1.11E+00	8.09E−02	6.66E−03	1.84E−03	9.58E−04	1.69E−04
165.00	1.72E+00	1.16E+00	8.41E−02	6.51E−03	1.77E−03	9.23E−04	1.65E−04
180.00	1.74E+00	1.18E+00	8.53E−02	6.46E−03	1.75E−03	9.11E−04	1.64E−04
total	8.86E+01	6.91E+01	1.44E+01	3.24E+00	1.94E+00	1.50E+00	7.60E−01
rel ff	8.74E+01	6.61E+01	1.39E+01	3.27E+00	1.98E+00	1.54E+00	7.85E−01
nrl ff	9.05E+01	6.87E+01	1.47E+01	3.48E+00	2.11E+00	1.65E+00	8.39E−01

TABLE 1. Predicted *S*-matrix differential elastic scattering cross sections for photon energies (50.0, 59.54, 145.4, 316.5, 411.8, 468.1, 661.6, 778.9, 964.0, 1004.8, 1112.1, 1274.5, 1408.0 and 1500.0). The angle integrated total cross sections for each element and energies are presented. ''total'' represents total cross sections from this work, ''rel ff'' represents total cross sections calculated from the relativistic form factor and ''nrl ff'' represents total cross sections calculated from the nonrelativistic form factor—Continued[a]

θ (deg)	Photon energy (keV)						
	778.9	964.0	1004.8	1112.1	1274.5	1408.0	1500.0
Cerium ($Z=58$)							
0.00	2.63E+02	2.63E+02	2.63E+02	2.63E+02	2.63E+02	2.63E+02	2.63E+02
0.01	2.63E+02	2.63E+02	2.63E+02	2.63E+02	2.62E+02	2.62E+02	2.62E+02
0.02	2.62E+02	2.62E+02	2.62E+02	2.61E+02	2.61E+02	2.60E+02	2.60E+02
0.04	2.60E+02	2.58E+02	2.58E+02	2.57E+02	2.55E+02	2.53E+02	2.52E+02
0.06	2.56E+02	2.53E+02	2.52E+02	2.50E+02	2.47E+02	2.44E+02	2.41E+02
0.10	2.47E+02	2.40E+02	2.38E+02	2.34E+02	2.27E+02	2.22E+02	2.19E+02
0.20	2.17E+02	2.03E+02	2.00E+02	1.92E+02	1.81E+02	1.71E+02	1.65E+02
0.30	1.88E+02	1.69E+02	1.65E+02	1.54E+02	1.40E+02	1.28E+02	1.21E+02
0.40	1.62E+02	1.39E+02	1.34E+02	1.23E+02	1.08E+02	9.75E+01	9.16E+01
0.50	1.38E+02	1.14E+02	1.09E+02	9.83E+01	8.47E+01	7.60E+01	7.12E+01
0.60	1.18E+02	9.45E+01	9.02E+01	8.01E+01	6.79E+01	6.01E+01	5.58E+01
0.70	1.01E+02	7.95E+01	7.56E+01	6.64E+01	5.52E+01	4.79E+01	4.37E+01
0.80	8.74E+01	6.75E+01	6.39E+01	5.56E+01	4.54E+01	3.88E+01	3.49E+01
1.00	6.67E+01	4.96E+01	4.66E+01	3.99E+01	3.20E+01	2.71E+01	2.42E+01
1.20	5.18E+01	3.74E+01	3.50E+01	2.97E+01	2.40E+01	2.07E+01	1.90E+01
1.50	3.69E+01	2.61E+01	2.44E+01	2.06E+01	1.67E+01	1.46E+01	1.35E+01
1.70	3.03E+01	2.15E+01	2.01E+01	1.70E+01	1.34E+01	1.12E+01	9.93E+00
2.00	2.35E+01	1.67E+01	1.56E+01	1.30E+01	9.60E+00	7.17E+00	5.65E+00
2.50	1.63E+01	1.11E+01	1.02E+01	8.08E+00	5.34E+00	3.48E+00	2.44E+00
3.00	1.15E+01	7.00E+00	6.28E+00	4.74E+00	3.10E+00	2.18E+00	1.70E+00
3.50	8.02E+00	4.37E+00	3.86E+00	2.87E+00	2.03E+00	1.74E+00	1.69E+00
4.00	5.58E+00	2.89E+00	2.55E+00	1.92E+00	1.49E+00	1.48E+00	1.68E+00
5.00	2.98E+00	1.69E+00	1.53E+00	1.21E+00	9.43E−01	8.38E−01	8.08E−01
6.00	1.90E+00	1.25E+00	1.15E+00	9.30E−01	6.13E−01	3.70E−01	2.31E−01
7.00	1.36E+00	9.11E−01	8.37E−01	6.49E−01	3.74E−01	1.85E−01	9.46E−02
8.00	1.02E+00	6.11E−01	5.47E−01	4.01E−01	2.25E−01	1.19E−01	6.78E−02
9.00	7.57E−01	3.94E−01	3.43E−01	2.41E−01	1.42E−01	9.30E−02	6.92E−02
10.00	5.54E−01	2.58E−01	2.20E−01	1.52E−01	9.87E−02	8.12E−02	7.87E−02
12.50	2.55E−01	1.14E−01	9.77E−02	7.06E−02	5.46E−02	5.80E−02	7.17E−02
15.00	1.36E−01	7.20E−02	6.45E−02	5.02E−02	3.78E−02	3.19E−02	2.90E−02
17.50	8.63E−02	5.41E−02	4.98E−02	4.00E−02	2.64E−02	1.57E−02	9.46E−03
20.00	6.18E−02	4.08E−02	3.76E−02	2.95E−02	1.70E−02	8.05E−03	3.86E−03
22.50	4.70E−02	2.94E−02	2.66E−02	1.97E−02	1.02E−02	4.47E−03	2.04E−03
25.00	3.62E−02	2.04E−02	1.79E−02	1.23E−02	5.95E−03	2.60E−03	1.25E−03
27.50	2.78E−02	1.38E−02	1.18E−02	7.53E−03	3.42E−03	1.54E−03	8.03E−04
30.00	2.10E−02	9.26E−03	7.67E−03	4.60E−03	1.99E−03	9.20E−04	5.15E−04
35.00	1.16E−02	4.14E−03	3.28E−03	1.77E−03	6.90E−04	3.22E−04	1.94E−04
40.00	6.26E−03	1.90E−03	1.46E−03	7.29E−04	2.63E−04	1.21E−04	7.35E−05
45.00	3.37E−03	9.13E−04	6.86E−04	3.28E−04	1.15E−04	5.27E−05	3.28E−05
50.00	1.85E−03	4.64E−04	3.45E−04	1.62E−04	5.73E−05	2.74E−05	1.78E−05
55.00	1.06E−03	2.54E−04	1.89E−04	9.06E−05	3.45E−05	1.85E−05	1.33E−05
60.00	6.38E−04	1.53E−04	1.15E−04	5.78E−05	2.49E−05	1.55E−05	1.28E−05
65.00	4.10E−04	1.01E−04	7.74E−05	4.10E−05	2.00E−05	1.43E−05	1.32E−05
70.00	2.84E−04	7.42E−05	5.77E−05	3.25E−05	1.77E−05	1.40E−05	1.39E−05
75.00	2.11E−04	5.92E−05	4.70E−05	2.79E−05	1.66E−05	1.40E−05	1.44E−05
80.00	1.68E−04	5.07E−05	4.10E−05	2.56E−05	1.62E−05	1.41E−05	1.45E−05
85.00	1.41E−04	4.55E−05	3.74E−05	2.44E−05	1.62E−05	1.44E−05	1.47E−05
90.00	1.23E−04	4.25E−05	3.54E−05	2.40E−05	1.66E−05	1.48E−05	1.49E−05
95.00	1.11E−04	4.05E−05	3.42E−05	2.39E−05	1.70E−05	1.52E−05	1.52E−05
105.00	9.77E−05	3.89E−05	3.35E−05	2.45E−05	1.84E−05	1.65E−05	1.61E−05
120.00	8.83E−05	3.87E−05	3.40E−05	2.62E−05	2.07E−05	1.87E−05	1.78E−05
135.00	8.49E−05	4.02E−05	3.59E−05	2.86E−05	2.33E−05	2.08E−05	1.92E−05
150.00	8.38E−05	4.17E−05	3.77E−05	3.08E−05	2.55E−05	2.27E−05	2.04E−05
165.00	8.36E−05	4.29E−05	3.90E−05	3.24E−05	2.72E−05	2.40E−05	2.14E−05
180.00	8.35E−05	4.33E−05	3.95E−05	3.30E−05	2.78E−05	2.46E−05	2.19E−05
total	5.47E−01	3.59E−01	3.31E−01	2.70E−01	2.04E−01	1.67E−01	1.49E−01
rel ff	5.70E−01	3.74E−01	3.45E−01	2.81E−01	2.14E−01	1.76E−01	1.56E−01
nrl ff	6.10E−01	4.01E−01	3.69E−01	3.02E−01	2.30E−01	1.89E−01	1.67E−01

TABLE 1. Predicted *S*-matrix differential elastic scattering cross sections for photon energies (50.0, 59.54, 145.4, 316.5, 411.8, 468.1, 661.6, 778.9, 964.0, 1004.8, 1112.1, 1274.5, 1408.0 and 1500.0). The angle integrated total cross sections for each element and energies are presented. ''total'' represents total cross sections from this work, ''rel ff'' represents total cross sections calculated from the relativistic form factor and ''nrl ff'' represents total cross sections calculated from the nonrelativistic form factor—Continued[a]

θ (deg)	Photon energy (keV)						
	50.0	59.5	145.4	316.5	411.8	468.1	661.6
Proaseodymium ($Z=59$)							
0.00	2.74E+02	2.74E+02	2.75E+02	2.73E+02	2.73E+02	2.73E+02	2.72E+02
0.01	2.74E+02	2.74E+02	2.75E+02	2.73E+02	2.73E+02	2.72E+02	2.72E+02
0.02	2.74E+02	2.74E+02	2.75E+02	2.73E+02	2.72E+02	2.72E+02	2.72E+02
0.04	2.74E+02	2.74E+02	2.74E+02	2.72E+02	2.72E+02	2.72E+02	2.70E+02
0.06	2.74E+02	2.74E+02	2.74E+02	2.72E+02	2.71E+02	2.70E+02	2.67E+02
0.10	2.74E+02	2.74E+02	2.74E+02	2.70E+02	2.67E+02	2.66E+02	2.59E+02
0.20	2.74E+02	2.74E+02	2.72E+02	2.61E+02	2.54E+02	2.50E+02	2.34E+02
0.30	2.73E+02	2.73E+02	2.68E+02	2.49E+02	2.38E+02	2.31E+02	2.09E+02
0.40	2.73E+02	2.72E+02	2.64E+02	2.37E+02	2.22E+02	2.13E+02	1.84E+02
0.50	2.72E+02	2.71E+02	2.59E+02	2.25E+02	2.06E+02	1.96E+02	1.61E+02
0.60	2.71E+02	2.70E+02	2.54E+02	2.12E+02	1.91E+02	1.79E+02	1.41E+02
0.70	2.70E+02	2.68E+02	2.48E+02	2.00E+02	1.76E+02	1.63E+02	1.23E+02
0.80	2.69E+02	2.67E+02	2.42E+02	1.89E+02	1.62E+02	1.48E+02	1.08E+02
1.00	2.66E+02	2.63E+02	2.31E+02	1.67E+02	1.37E+02	1.22E+02	8.52E+01
1.20	2.63E+02	2.59E+02	2.19E+02	1.47E+02	1.16E+02	1.02E+02	6.81E+01
1.50	2.58E+02	2.52E+02	2.03E+02	1.21E+02	9.23E+01	7.94E+01	4.96E+01
1.70	2.54E+02	2.48E+02	1.92E+02	1.07E+02	7.99E+01	6.78E+01	4.08E+01
2.00	2.48E+02	2.41E+02	1.76E+02	8.99E+01	6.50E+01	5.42E+01	3.14E+01
2.50	2.39E+02	2.29E+02	1.52E+02	6.84E+01	4.70E+01	3.87E+01	2.22E+01
3.00	2.30E+02	2.17E+02	1.31E+02	5.31E+01	3.52E+01	2.88E+01	1.67E+01
3.50	2.21E+02	2.06E+02	1.14E+02	4.22E+01	2.75E+01	2.24E+01	1.26E+01
4.00	2.11E+02	1.95E+02	9.92E+01	3.41E+01	2.24E+01	1.80E+01	9.25E+00
5.00	1.91E+02	1.73E+02	7.68E+01	2.38E+01	1.57E+01	1.20E+01	4.92E+00
6.00	1.73E+02	1.53E+02	6.04E+01	1.76E+01	1.09E+01	7.99E+00	2.89E+00
7.00	1.56E+02	1.35E+02	4.82E+01	1.33E+01	7.40E+00	5.29E+00	2.00E+00
8.00	1.41E+02	1.20E+02	3.90E+01	1.01E+01	5.00E+00	3.59E+00	1.55E+00
9.00	1.27E+02	1.07E+02	3.23E+01	7.63E+00	3.52E+00	2.55E+00	1.23E+00
10.00	1.14E+02	9.55E+01	2.73E+01	5.78E+00	2.64E+00	1.93E+00	9.65E−01
12.50	8.66E+01	7.32E+01	1.93E+01	3.08E+00	1.63E+00	1.19E+00	4.87E−01
15.00	6.71E+01	5.70E+01	1.41E+01	1.90E+00	1.13E+00	7.95E−01	2.47E−01
17.50	5.38E+01	4.49E+01	1.02E+01	1.33E+00	7.60E−01	5.12E−01	1.43E−01
20.00	4.45E+01	3.60E+01	7.16E+00	9.87E−01	4.90E−01	3.23E−01	9.62E−02
22.50	3.78E+01	2.94E+01	5.05E+00	7.38E−01	3.16E−01	2.08E−01	7.21E−02
25.00	3.26E+01	2.46E+01	3.66E+00	5.45E−01	2.12E−01	1.41E−01	5.69E−02
27.50	2.84E+01	2.09E+01	2.77E+00	4.00E−01	1.50E−01	1.01E−01	4.56E−02
30.00	2.47E+01	1.80E+01	2.21E+00	2.94E−01	1.12E−01	7.74E−02	3.64E−02
35.00	1.85E+01	1.36E+01	1.55E+00	1.66E−01	7.29E−02	5.15E−02	2.27E−02
40.00	1.36E+01	1.02E+01	1.17E+00	1.03E−01	5.25E−02	3.71E−02	1.37E−02
45.00	9.89E+00	7.49E+00	8.74E−01	6.97E−02	3.90E−02	2.71E−02	8.17E−03
50.00	7.21E+00	5.48E+00	6.43E−01	5.10E−02	2.90E−02	1.96E−02	4.88E−03
55.00	5.34E+00	4.03E+00	4.67E−01	3.93E−02	2.16E−02	1.40E−02	2.98E−03
60.00	4.06E+00	3.02E+00	3.40E−01	3.12E−02	1.60E−02	1.00E−02	1.88E−03
65.00	3.19E+00	2.33E+00	2.51E−01	2.53E−02	1.20E−02	7.27E−03	1.23E−03
70.00	2.60E+00	1.87E+00	1.91E−01	2.09E−02	9.18E−03	5.36E−03	8.53E−04
75.00	2.20E+00	1.55E+00	1.50E−01	1.75E−02	7.16E−03	4.08E−03	6.25E−04
80.00	1.92E+00	1.34E+00	1.22E−01	1.50E−02	5.74E−03	3.21E−03	4.84E−04
85.00	1.74E+00	1.19E+00	1.04E−01	1.31E−02	4.75E−03	2.61E−03	3.94E−04
90.00	1.61E+00	1.10E+00	9.20E−02	1.17E−02	4.04E−03	2.20E−03	3.36E−04
95.00	1.53E+00	1.03E+00	8.42E−02	1.06E−02	3.54E−03	1.91E−03	2.96E−04
105.00	1.47E+00	9.81E−01	7.66E−02	9.18E−03	2.90E−03	1.55E−03	2.48E−04
120.00	1.49E+00	1.00E+00	7.58E−02	8.10E−03	2.42E−03	1.28E−03	2.13E−04
135.00	1.59E+00	1.07E+00	7.99E−02	7.57E−03	2.17E−03	1.14E−03	1.96E−04
150.00	1.68E+00	1.13E+00	8.46E−02	7.27E−03	2.04E−03	1.07E−03	1.88E−04
165.00	1.75E+00	1.18E+00	8.80E−02	7.12E−03	1.97E−03	1.03E−03	1.84E−04
180.00	1.77E+00	1.20E+00	8.92E−02	7.07E−03	1.95E−03	1.02E−03	1.83E−04
total	9.14E+01	7.14E+01	1.50E+01	3.39E+00	2.03E+00	1.57E+00	7.96E−01
rel ff	9.13E+01	6.91E+01	1.46E+01	3.42E+00	2.07E+00	1.62E+00	8.23E−01
nrl ff	9.46E+01	7.19E+01	1.54E+01	3.65E+00	2.21E+00	1.73E+00	8.82E−01

TABLE 1. Predicted *S*-matrix differential elastic scattering cross sections for photon energies (50.0, 59.54, 145.4, 316.5, 411.8, 468.1, 661.6, 778.9, 964.0, 1004.8, 1112.1, 1274.5, 1408.0 and 1500.0). The angle integrated total cross sections for each element and energies are presented. ''total'' represents total cross sections from this work, ''rel ff'' represents total cross sections calculated from the relativistic form factor and ''nrl ff'' represents total cross sections calculated from the nonrelativistic form factor—Continued[a]

θ (deg)	Photon energy (keV)						
	778.9	964.0	1004.8	1112.1	1274.5	1408.0	1500.0
Proaseodymium ($Z=59$)							
0.00	2.72E+02	2.72E+02	2.72E+02	2.72E+02	2.72E+02	2.72E+02	2.72E+02
0.01	2.72E+02	2.72E+02	2.72E+02	2.72E+02	2.71E+02	2.71E+02	2.71E+02
0.02	2.72E+02	2.71E+02	2.71E+02	2.71E+02	2.70E+02	2.69E+02	2.69E+02
0.04	2.69E+02	2.67E+02	2.67E+02	2.66E+02	2.64E+02	2.62E+02	2.61E+02
0.06	2.65E+02	2.62E+02	2.61E+02	2.59E+02	2.55E+02	2.52E+02	2.49E+02
0.10	2.55E+02	2.48E+02	2.46E+02	2.42E+02	2.35E+02	2.30E+02	2.27E+02
0.20	2.25E+02	2.10E+02	2.07E+02	1.99E+02	1.87E+02	1.78E+02	1.72E+02
0.30	1.95E+02	1.75E+02	1.71E+02	1.60E+02	1.45E+02	1.33E+02	1.25E+02
0.40	1.68E+02	1.44E+02	1.39E+02	1.27E+02	1.12E+02	1.02E+02	9.55E+01
0.50	1.43E+02	1.18E+02	1.14E+02	1.02E+02	8.83E+01	7.94E+01	7.44E+01
0.60	1.22E+02	9.85E+01	9.41E+01	8.36E+01	7.09E+01	6.28E+01	5.83E+01
0.70	1.05E+02	8.29E+01	7.89E+01	6.94E+01	5.77E+01	5.00E+01	4.56E+01
0.80	9.12E+01	7.05E+01	6.67E+01	5.81E+01	4.74E+01	4.04E+01	3.62E+01
1.00	6.96E+01	5.18E+01	4.87E+01	4.16E+01	3.33E+01	2.80E+01	2.50E+01
1.20	5.41E+01	3.89E+01	3.64E+01	3.09E+01	2.48E+01	2.14E+01	1.96E+01
1.50	3.84E+01	2.70E+01	2.52E+01	2.13E+01	1.74E+01	1.53E+01	1.43E+01
1.70	3.15E+01	2.22E+01	2.07E+01	1.76E+01	1.40E+01	1.19E+01	1.06E+01
2.00	2.43E+01	1.74E+01	1.62E+01	1.35E+01	1.01E+01	7.63E+00	6.07E+00
2.50	1.70E+01	1.17E+01	1.08E+01	8.55E+00	5.66E+00	3.67E+00	2.54E+00
3.00	1.21E+01	7.43E+00	6.69E+00	5.06E+00	3.28E+00	2.25E+00	1.71E+00
3.50	8.46E+00	4.64E+00	4.10E+00	3.04E+00	2.13E+00	1.78E+00	1.70E+00
4.00	5.90E+00	3.05E+00	2.69E+00	2.01E+00	1.55E+00	1.53E+00	1.74E+00
5.00	3.13E+00	1.76E+00	1.58E+00	1.25E+00	9.81E−01	8.99E−01	8.98E−01
6.00	1.98E+00	1.30E+00	1.20E+00	9.65E−01	6.46E−01	4.01E−01	2.58E−01
7.00	1.42E+00	9.57E−01	8.80E−01	6.87E−01	3.99E−01	1.97E−01	1.01E−01
8.00	1.07E+00	6.51E−01	5.84E−01	4.31E−01	2.40E−01	1.24E−01	6.88E−02
9.00	7.97E−01	4.23E−01	3.69E−01	2.60E−01	1.52E−01	9.55E−02	6.81E−02
10.00	5.87E−01	2.76E−01	2.37E−01	1.63E−01	1.04E−01	8.28E−02	7.74E−02
12.50	2.72E−01	1.20E−01	1.03E−01	7.35E−02	5.65E−02	6.02E−02	7.50E−02
15.00	1.44E−01	7.45E−02	6.64E−02	5.14E−02	3.90E−02	3.39E−02	3.20E−02
17.50	9.02E−02	5.57E−02	5.12E−02	4.11E−02	2.75E−02	1.69E−02	1.06E−02
20.00	6.42E−02	4.23E−02	3.90E−02	3.08E−02	1.80E−02	8.69E−03	4.24E−03
22.50	4.87E−02	3.08E−02	2.80E−02	2.09E−02	1.10E−02	4.83E−03	2.21E−03
25.00	3.77E−02	2.16E−02	1.91E−02	1.33E−02	6.47E−03	2.82E−03	1.34E−03
27.50	2.90E−02	1.47E−02	1.26E−02	8.19E−03	3.76E−03	1.68E−03	8.63E−04
30.00	2.21E−02	9.97E−03	8.30E−03	5.04E−03	2.20E−03	1.01E−03	5.57E−04
35.00	1.24E−02	4.52E−03	3.59E−03	1.96E−03	7.70E−04	3.59E−04	2.14E−04
40.00	6.75E−03	2.09E−03	1.61E−03	8.12E−04	2.96E−04	1.35E−04	8.22E−05
45.00	3.67E−03	1.01E−03	7.63E−04	3.67E−04	1.29E−04	5.93E−05	3.69E−05
50.00	2.04E−03	5.17E−04	3.85E−04	1.82E−04	6.42E−05	3.06E−05	1.99E−05
55.00	1.17E−03	2.84E−04	2.11E−04	1.01E−04	3.85E−05	2.05E−05	1.47E−05
60.00	7.08E−04	1.71E−04	1.29E−04	6.45E−05	2.76E−05	1.71E−05	1.40E−05
65.00	4.57E−04	1.13E−04	8.65E−05	4.57E−05	2.21E−05	1.56E−05	1.43E−05
70.00	3.17E−04	8.29E−05	6.44E−05	3.61E−05	1.94E−05	1.52E−05	1.50E−05
75.00	2.36E−04	6.60E−05	5.23E−05	3.09E−05	1.82E−05	1.52E−05	1.56E−05
80.00	1.88E−04	5.64E−05	4.55E−05	2.83E−05	1.77E−05	1.52E−05	1.56E−05
85.00	1.57E−04	5.05E−05	4.14E−05	2.68E−05	1.77E−05	1.55E−05	1.58E−05
90.00	1.38E−04	4.71E−05	3.92E−05	2.63E−05	1.80E−05	1.59E−05	1.60E−05
95.00	1.24E−04	4.49E−05	3.78E−05	2.61E−05	1.84E−05	1.64E−05	1.63E−05
105.00	1.09E−04	4.28E−05	3.67E−05	2.66E−05	1.97E−05	1.77E−05	1.72E−05
120.00	9.81E−05	4.23E−05	3.71E−05	2.83E−05	2.21E−05	1.99E−05	1.90E−05
135.00	9.40E−05	4.37E−05	3.89E−05	3.08E−05	2.48E−05	2.21E−05	2.05E−05
150.00	9.25E−05	4.52E−05	4.07E−05	3.30E−05	2.71E−05	2.40E−05	2.18E−05
165.00	9.21E−05	4.65E−05	4.21E−05	3.46E−05	2.88E−05	2.55E−05	2.29E−05
180.00	9.20E−05	4.69E−05	4.26E−05	3.52E−05	2.94E−05	2.60E−05	2.33E−05
total	5.73E−01	3.75E−01	3.46E−01	2.83E−01	2.14E−01	1.74E−01	1.56E−01
rel ff	5.97E−01	3.92E−01	3.61E−01	2.95E−01	2.25E−01	1.85E−01	1.63E−01
nrl ff	6.41E−01	4.21E−01	3.88E−01	3.17E−01	2.41E−01	1.98E−01	1.75E−01

TABLE 1. Predicted *S*-matrix differential elastic scattering cross sections for photon energies (50.0, 59.54, 145.4, 316.5, 411.8, 468.1, 661.6, 778.9, 964.0, 1004.8, 1112.1, 1274.5, 1408.0 and 1500.0). The angle integrated total cross sections for each element and energies are presented. ''total'' represents total cross sections from this work, ''rel ff'' represents total cross sections calculated from the relativistic form factor and ''nrl ff'' represents total cross sections calculated from the nonrelativistic form factor—Continued[a]

θ (deg)	Photon energy (keV)						
	50.0	59.5	145.4	316.5	411.8	468.1	661.6
Neodymium ($Z=60$)							
0.00	2.82E+02	2.83E+02	2.84E+02	2.82E+02	2.82E+02	2.82E+02	2.82E+02
0.01	2.82E+02	2.83E+02	2.84E+02	2.82E+02	2.82E+02	2.82E+02	2.81E+02
0.02	2.82E+02	2.83E+02	2.84E+02	2.82E+02	2.82E+02	2.81E+02	2.81E+02
0.04	2.82E+02	2.83E+02	2.84E+02	2.82E+02	2.81E+02	2.81E+02	2.79E+02
0.06	2.82E+02	2.83E+02	2.84E+02	2.81E+02	2.80E+02	2.79E+02	2.76E+02
0.10	2.82E+02	2.83E+02	2.83E+02	2.79E+02	2.76E+02	2.75E+02	2.68E+02
0.20	2.82E+02	2.82E+02	2.81E+02	2.70E+02	2.63E+02	2.58E+02	2.42E+02
0.30	2.82E+02	2.82E+02	2.78E+02	2.58E+02	2.46E+02	2.39E+02	2.16E+02
0.40	2.81E+02	2.81E+02	2.73E+02	2.45E+02	2.30E+02	2.21E+02	1.91E+02
0.50	2.80E+02	2.80E+02	2.68E+02	2.32E+02	2.14E+02	2.03E+02	1.68E+02
0.60	2.80E+02	2.78E+02	2.63E+02	2.20E+02	1.98E+02	1.85E+02	1.47E+02
0.70	2.79E+02	2.77E+02	2.57E+02	2.08E+02	1.83E+02	1.69E+02	1.28E+02
0.80	2.77E+02	2.75E+02	2.51E+02	1.96E+02	1.68E+02	1.54E+02	1.13E+02
1.00	2.75E+02	2.71E+02	2.39E+02	1.73E+02	1.42E+02	1.27E+02	8.89E+01
1.20	2.71E+02	2.67E+02	2.27E+02	1.52E+02	1.21E+02	1.07E+02	7.11E+01
1.50	2.66E+02	2.60E+02	2.10E+02	1.26E+02	9.63E+01	8.29E+01	5.18E+01
1.70	2.62E+02	2.56E+02	1.99E+02	1.12E+02	8.34E+01	7.08E+01	4.25E+01
2.00	2.56E+02	2.48E+02	1.83E+02	9.38E+01	6.79E+01	5.66E+01	3.26E+01
2.50	2.47E+02	2.36E+02	1.58E+02	7.14E+01	4.91E+01	4.03E+01	2.29E+01
3.00	2.37E+02	2.24E+02	1.36E+02	5.55E+01	3.66E+01	2.99E+01	1.73E+01
3.50	2.28E+02	2.13E+02	1.18E+02	4.39E+01	2.85E+01	2.32E+01	1.31E+01
4.00	2.18E+02	2.01E+02	1.03E+02	3.55E+01	2.32E+01	1.86E+01	9.75E+00
5.00	1.98E+02	1.79E+02	8.02E+01	2.47E+01	1.63E+01	1.25E+01	5.21E+00
6.00	1.79E+02	1.59E+02	6.31E+01	1.83E+01	1.15E+01	8.41E+00	3.04E+00
7.00	1.61E+02	1.40E+02	5.03E+01	1.39E+01	7.82E+00	5.60E+00	2.09E+00
8.00	1.46E+02	1.25E+02	4.06E+01	1.06E+01	5.29E+00	3.79E+00	1.61E+00
9.00	1.32E+02	1.11E+02	3.35E+01	8.04E+00	3.71E+00	2.68E+00	1.28E+00
10.00	1.18E+02	9.92E+01	2.83E+01	6.11E+00	2.77E+00	2.02E+00	1.01E+00
12.50	9.03E+01	7.62E+01	2.00E+01	3.25E+00	1.69E+00	1.23E+00	5.18E−01
15.00	6.97E+01	5.92E+01	1.47E+01	1.99E+00	1.18E+00	8.32E−01	2.63E−01
17.50	5.56E+01	4.66E+01	1.07E+01	1.39E+00	8.02E−01	5.41E−01	1.51E−01
20.00	4.58E+01	3.72E+01	7.57E+00	1.03E+00	5.22E−01	3.44E−01	1.01E−01
22.50	3.88E+01	3.03E+01	5.35E+00	7.74E−01	3.38E−01	2.22E−01	7.48E−02
25.00	3.34E+01	2.53E+01	3.87E+00	5.75E−01	2.26E−01	1.50E−01	5.89E−02
27.50	2.91E+01	2.15E+01	2.92E+00	4.24E−01	1.59E−01	1.07E−01	4.72E−02
30.00	2.53E+01	1.85E+01	2.31E+00	3.13E−01	1.18E−01	8.11E−02	3.79E−02
35.00	1.91E+01	1.40E+01	1.62E+00	1.77E−01	7.59E−02	5.34E−02	2.38E−02
40.00	1.41E+01	1.05E+01	1.21E+00	1.09E−01	5.44E−02	3.85E−02	1.45E−02
45.00	1.03E+01	7.79E+00	9.15E−01	7.32E−02	4.04E−02	2.82E−02	8.75E−03
50.00	7.50E+00	5.71E+00	6.78E−01	5.33E−02	3.02E−02	2.05E−02	5.28E−03
55.00	5.54E+00	4.20E+00	4.96E−01	4.09E−02	2.26E−02	1.48E−02	3.24E−03
60.00	4.19E+00	3.14E+00	3.63E−01	3.25E−02	1.69E−02	1.07E−02	2.05E−03
65.00	3.28E+00	2.42E+00	2.68E−01	2.64E−02	1.28E−02	7.78E−03	1.36E−03
70.00	2.66E+00	1.92E+00	2.04E−01	2.18E−02	9.79E−03	5.78E−03	9.43E−04
75.00	2.23E+00	1.59E+00	1.60E−01	1.84E−02	7.68E−03	4.42E−03	6.93E−04
80.00	1.95E+00	1.37E+00	1.30E−01	1.58E−02	6.19E−03	3.49E−03	5.38E−04
85.00	1.75E+00	1.21E+00	1.11E−01	1.38E−02	5.14E−03	2.85E−03	4.38E−04
90.00	1.62E+00	1.11E+00	9.75E−02	1.24E−02	4.39E−03	2.41E−03	3.74E−04
95.00	1.54E+00	1.05E+00	8.90E−02	1.13E−02	3.86E−03	2.10E−03	3.30E−04
105.00	1.47E+00	9.89E−01	8.07E−02	9.84E−03	3.18E−03	1.71E−03	2.76E−04
120.00	1.49E+00	1.01E+00	7.95E−02	8.75E−03	2.66E−03	1.42E−03	2.37E−04
135.00	1.59E+00	1.07E+00	8.36E−02	8.21E−03	2.40E−03	1.27E−03	2.18E−04
150.00	1.68E+00	1.14E+00	8.85E−02	7.92E−03	2.26E−03	1.19E−03	2.08E−04
165.00	1.75E+00	1.19E+00	9.21E−02	7.76E−03	2.18E−03	1.14E−03	2.04E−04
180.00	1.78E+00	1.21E+00	9.34E−02	7.72E−03	2.16E−03	1.13E−03	2.03E−04
total	9.41E+01	7.38E+01	1.57E+01	3.55E+00	2.13E+00	1.65E+00	8.32E−01
rel ff	9.52E+01	7.21E+01	1.52E+01	3.58E+00	2.17E+00	1.69E+00	8.61E−01
nrl ff	9.87E+01	7.50E+01	1.61E+01	3.82E+00	2.32E+00	1.81E+00	9.24E−01

TABLE 1. Predicted *S*-matrix differential elastic scattering cross sections for photon energies (50.0, 59.54, 145.4, 316.5, 411.8, 468.1, 661.6, 778.9, 964.0, 1004.8, 1112.1, 1274.5, 1408.0 and 1500.0). The angle integrated total cross sections for each element and energies are presented. ''total'' represents total cross sections from this work, ''rel ff'' represents total cross sections calculated from the relativistic form factor and ''nrl ff'' represents total cross sections calculated from the nonrelativistic form factor—Continued[a]

θ (deg)	Photon energy (keV)						
	778.9	964.0	1004.8	1112.1	1274.5	1408.0	1500.0
Neodymium ($Z=60$)							
0.00	2.81E+02	2.81E+02	2.81E+02	2.81E+02	2.81E+02	2.81E+02	2.81E+02
0.01	2.81E+02	2.81E+02	2.81E+02	2.81E+02	2.81E+02	2.80E+02	2.80E+02
0.02	2.81E+02	2.80E+02	2.80E+02	2.80E+02	2.79E+02	2.78E+02	2.78E+02
0.04	2.78E+02	2.76E+02	2.76E+02	2.75E+02	2.73E+02	2.71E+02	2.70E+02
0.06	2.74E+02	2.71E+02	2.70E+02	2.68E+02	2.64E+02	2.61E+02	2.58E+02
0.10	2.64E+02	2.56E+02	2.55E+02	2.50E+02	2.44E+02	2.38E+02	2.35E+02
0.20	2.33E+02	2.18E+02	2.15E+02	2.06E+02	1.94E+02	1.85E+02	1.78E+02
0.30	2.03E+02	1.82E+02	1.78E+02	1.67E+02	1.51E+02	1.38E+02	1.31E+02
0.40	1.74E+02	1.50E+02	1.45E+02	1.33E+02	1.17E+02	1.06E+02	9.95E+01
0.50	1.49E+02	1.23E+02	1.18E+02	1.07E+02	9.21E+01	8.28E+01	7.77E+01
0.60	1.27E+02	1.03E+02	9.81E+01	8.73E+01	7.40E+01	6.56E+01	6.09E+01
0.70	1.10E+02	8.66E+01	8.23E+01	7.24E+01	6.02E+01	5.22E+01	4.75E+01
0.80	9.51E+01	7.36E+01	6.97E+01	6.06E+01	4.95E+01	4.20E+01	3.76E+01
1.00	7.27E+01	5.41E+01	5.08E+01	4.34E+01	3.46E+01	2.90E+01	2.58E+01
1.20	5.65E+01	4.05E+01	3.79E+01	3.21E+01	2.57E+01	2.21E+01	2.03E+01
1.50	4.00E+01	2.80E+01	2.61E+01	2.21E+01	1.80E+01	1.59E+01	1.51E+01
1.70	3.27E+01	2.30E+01	2.15E+01	1.82E+01	1.46E+01	1.25E+01	1.13E+01
2.00	2.52E+01	1.80E+01	1.68E+01	1.41E+01	1.06E+01	8.10E+00	6.52E+00
2.50	1.77E+01	1.22E+01	1.13E+01	9.03E+00	6.00E+00	3.87E+00	2.66E+00
3.00	1.26E+01	7.87E+00	7.09E+00	5.38E+00	3.47E+00	2.34E+00	1.74E+00
3.50	8.91E+00	4.92E+00	4.36E+00	3.23E+00	2.24E+00	1.83E+00	1.71E+00
4.00	6.24E+00	3.22E+00	2.83E+00	2.11E+00	1.61E+00	1.58E+00	1.79E+00
5.00	3.30E+00	1.82E+00	1.64E+00	1.29E+00	1.02E+00	9.58E−01	9.87E−01
6.00	2.07E+00	1.34E+00	1.24E+00	1.00E+00	6.79E−01	4.34E−01	2.87E−01
7.00	1.48E+00	1.00E+00	9.23E−01	7.24E−01	4.24E−01	2.11E−01	1.08E−01
8.00	1.11E+00	6.90E−01	6.21E−01	4.61E−01	2.57E−01	1.30E−01	7.04E−02
9.00	8.38E−01	4.52E−01	3.96E−01	2.80E−01	1.62E−01	9.84E−02	6.75E−02
10.00	6.21E−01	2.96E−01	2.54E−01	1.75E−01	1.10E−01	8.46E−02	7.61E−02
12.50	2.89E−01	1.26E−01	1.08E−01	7.68E−02	5.86E−02	6.22E−02	7.76E−02
15.00	1.52E−01	7.72E−02	6.85E−02	5.26E−02	4.02E−02	3.60E−02	3.52E−02
17.50	9.44E−02	5.74E−02	5.26E−02	4.21E−02	2.85E−02	1.81E−02	1.18E−02
20.00	6.67E−02	4.38E−02	4.04E−02	3.20E−02	1.90E−02	9.38E−03	4.68E−03
22.50	5.05E−02	3.22E−02	2.93E−02	2.20E−02	1.18E−02	5.22E−03	2.40E−03
25.00	3.91E−02	2.28E−02	2.02E−02	1.42E−02	7.02E−03	3.06E−03	1.44E−03
27.50	3.03E−02	1.57E−02	1.35E−02	8.87E−03	4.12E−03	1.83E−03	9.27E−04
30.00	2.32E−02	1.07E−02	8.96E−03	5.51E−03	2.42E−03	1.11E−03	6.01E−04
35.00	1.32E−02	4.91E−03	3.93E−03	2.16E−03	8.58E−04	3.98E−04	2.34E−04
40.00	7.26E−03	2.30E−03	1.78E−03	9.03E−04	3.31E−04	1.52E−04	9.16E−05
45.00	3.99E−03	1.12E−03	8.45E−04	4.10E−04	1.45E−04	6.66E−05	4.13E−05
50.00	2.23E−03	5.74E−04	4.29E−04	2.03E−04	7.20E−05	3.43E−05	2.21E−05
55.00	1.29E−03	3.16E−04	2.36E−04	1.13E−04	4.30E−05	2.27E−05	1.62E−05
60.00	7.83E−04	1.91E−04	1.44E−04	7.20E−05	3.07E−05	1.88E−05	1.53E−05
65.00	5.07E−04	1.27E−04	9.65E−05	5.09E−05	2.44E−05	1.71E−05	1.56E−05
70.00	3.53E−04	9.25E−05	7.18E−05	4.00E−05	2.14E−05	1.66E−05	1.63E−05
75.00	2.63E−04	7.35E−05	5.82E−05	3.43E−05	1.99E−05	1.65E−05	1.68E−05
80.00	2.09E−04	6.27E−05	5.05E−05	3.12E−05	1.93E−05	1.65E−05	1.68E−05
85.00	1.75E−04	5.60E−05	4.59E−05	2.95E−05	1.92E−05	1.67E−05	1.70E−05
90.00	1.53E−04	5.22E−05	4.33E−05	2.88E−05	1.95E−05	1.71E−05	1.72E−05
95.00	1.39E−04	4.96E−05	4.16E−05	2.86E−05	1.99E−05	1.76E−05	1.75E−05
105.00	1.21E−04	4.71E−05	4.03E−05	2.90E−05	2.12E−05	1.89E−05	1.85E−05
120.00	1.09E−04	4.64E−05	4.05E−05	3.06E−05	2.36E−05	2.12E−05	2.03E−05
135.00	1.04E−04	4.77E−05	4.23E−05	3.31E−05	2.64E−05	2.35E−05	2.19E−05
150.00	1.02E−04	4.91E−05	4.40E−05	3.53E−05	2.87E−05	2.55E−05	2.32E−05
165.00	1.01E−04	5.03E−05	4.54E−05	3.70E−05	3.05E−05	2.70E−05	2.43E−05
180.00	1.01E−04	5.08E−05	4.59E−05	3.76E−05	3.11E−05	2.76E−05	2.48E−05
total	5.99E−01	3.93E−01	3.62E−01	2.96E−01	2.24E−01	1.82E−01	1.63E−01
rel ff	6.25E−01	4.11E−01	3.78E−01	3.09E−01	2.35E−01	1.93E−01	1.71E−01
nrl ff	6.72E−01	4.41E−01	4.07E−01	3.32E−01	2.53E−01	2.08E−01	1.84E−01

TABLE 1. Predicted *S*-matrix differential elastic scattering cross sections for photon energies (50.0, 59.54, 145.4, 316.5, 411.8, 468.1, 661.6, 778.9, 964.0, 1004.8, 1112.1, 1274.5, 1408.0 and 1500.0). The angle integrated total cross sections for each element and energies are presented. ''total'' represents total cross sections from this work, ''rel ff'' represents total cross sections calculated from the relativistic form factor and ''nrl ff'' represents total cross sections calculated from the nonrelativistic form factor—Continued[a]

θ (deg)	Photon energy (keV)						
	50.0	59.5	145.4	316.5	411.8	468.1	661.6
Promethium ($Z=61$)							
0.00	2.89E+02	2.90E+02	2.94E+02	2.92E+02	2.91E+02	2.91E+02	2.91E+02
0.01	2.89E+02	2.90E+02	2.94E+02	2.92E+02	2.91E+02	2.91E+02	2.91E+02
0.02	2.89E+02	2.90E+02	2.93E+02	2.91E+02	2.91E+02	2.91E+02	2.90E+02
0.04	2.89E+02	2.90E+02	2.93E+02	2.91E+02	2.91E+02	2.90E+02	2.89E+02
0.06	2.89E+02	2.90E+02	2.93E+02	2.91E+02	2.89E+02	2.89E+02	2.86E+02
0.10	2.89E+02	2.90E+02	2.93E+02	2.88E+02	2.86E+02	2.84E+02	2.78E+02
0.20	2.89E+02	2.90E+02	2.91E+02	2.79E+02	2.72E+02	2.68E+02	2.51E+02
0.30	2.89E+02	2.89E+02	2.87E+02	2.67E+02	2.55E+02	2.48E+02	2.25E+02
0.40	2.88E+02	2.88E+02	2.83E+02	2.54E+02	2.39E+02	2.29E+02	1.99E+02
0.50	2.87E+02	2.87E+02	2.78E+02	2.41E+02	2.22E+02	2.11E+02	1.75E+02
0.60	2.87E+02	2.86E+02	2.72E+02	2.29E+02	2.06E+02	1.93E+02	1.54E+02
0.70	2.86E+02	2.84E+02	2.66E+02	2.16E+02	1.91E+02	1.77E+02	1.35E+02
0.80	2.84E+02	2.83E+02	2.60E+02	2.04E+02	1.76E+02	1.61E+02	1.19E+02
1.00	2.82E+02	2.79E+02	2.48E+02	1.81E+02	1.50E+02	1.34E+02	9.37E+01
1.20	2.79E+02	2.75E+02	2.36E+02	1.60E+02	1.27E+02	1.12E+02	7.48E+01
1.50	2.73E+02	2.68E+02	2.19E+02	1.33E+02	1.01E+02	8.73E+01	5.43E+01
1.70	2.69E+02	2.63E+02	2.08E+02	1.18E+02	8.78E+01	7.45E+01	4.44E+01
2.00	2.63E+02	2.56E+02	1.91E+02	9.89E+01	7.14E+01	5.94E+01	3.39E+01
2.50	2.53E+02	2.44E+02	1.66E+02	7.52E+01	5.14E+01	4.20E+01	2.36E+01
3.00	2.44E+02	2.31E+02	1.44E+02	5.82E+01	3.81E+01	3.10E+01	1.77E+01
3.50	2.34E+02	2.20E+02	1.25E+02	4.59E+01	2.95E+01	2.39E+01	1.35E+01
4.00	2.24E+02	2.08E+02	1.09E+02	3.69E+01	2.38E+01	1.91E+01	1.02E+01
5.00	2.04E+02	1.86E+02	8.45E+01	2.55E+01	1.67E+01	1.29E+01	5.56E+00
6.00	1.85E+02	1.65E+02	6.63E+01	1.88E+01	1.19E+01	8.77E+00	3.24E+00
7.00	1.67E+02	1.46E+02	5.27E+01	1.43E+01	8.25E+00	5.92E+00	2.18E+00
8.00	1.52E+02	1.30E+02	4.24E+01	1.10E+01	5.65E+00	4.04E+00	1.65E+00
9.00	1.37E+02	1.16E+02	3.48E+01	8.41E+00	3.97E+00	2.86E+00	1.31E+00
10.00	1.24E+02	1.03E+02	2.92E+01	6.44E+00	2.94E+00	2.14E+00	1.05E+00
12.50	9.44E+01	7.91E+01	2.05E+01	3.45E+00	1.75E+00	1.27E+00	5.52E−01
15.00	7.24E+01	6.13E+01	1.51E+01	2.09E+00	1.22E+00	8.59E−01	2.84E−01
17.50	5.71E+01	4.80E+01	1.11E+01	1.44E+00	8.38E−01	5.69E−01	1.61E−01
20.00	4.65E+01	3.81E+01	7.99E+00	1.07E+00	5.55E−01	3.67E−01	1.06E−01
22.50	3.89E+01	3.08E+01	5.71E+00	8.04E−01	3.63E−01	2.39E−01	7.73E−02
25.00	3.32E+01	2.55E+01	4.14E+00	6.03E−01	2.43E−01	1.61E−01	6.03E−02
27.50	2.87E+01	2.15E+01	3.11E+00	4.49E−01	1.70E−01	1.14E−01	4.83E−02
30.00	2.49E+01	1.84E+01	2.44E+00	3.34E−01	1.26E−01	8.55E−02	3.89E−02
35.00	1.88E+01	1.38E+01	1.68E+00	1.90E−01	7.89E−02	5.52E−02	2.48E−02
40.00	1.39E+01	1.04E+01	1.25E+00	1.16E−01	5.58E−02	3.94E−02	1.54E−02
45.00	1.02E+01	7.79E+00	9.46E−01	7.72E−02	4.14E−02	2.90E−02	9.36E−03
50.00	7.50E+00	5.75E+00	7.09E−01	5.56E−02	3.12E−02	2.13E−02	5.70E−03
55.00	5.54E+00	4.24E+00	5.25E−01	4.23E−02	2.35E−02	1.55E−02	3.53E−03
60.00	4.17E+00	3.17E+00	3.88E−01	3.34E−02	1.77E−02	1.13E−02	2.25E−03
65.00	3.23E+00	2.42E+00	2.89E−01	2.72E−02	1.35E−02	8.30E−03	1.49E−03
70.00	2.58E+00	1.91E+00	2.20E−01	2.25E−02	1.04E−02	6.21E−03	1.04E−03
75.00	2.14E+00	1.56E+00	1.73E−01	1.91E−02	8.22E−03	4.78E−03	7.68E−04
80.00	1.83E+00	1.32E+00	1.41E−01	1.65E−02	6.66E−03	3.80E−03	5.97E−04
85.00	1.62E+00	1.15E+00	1.19E−01	1.45E−02	5.55E−03	3.12E−03	4.88E−04
90.00	1.48E+00	1.04E+00	1.05E−01	1.30E−02	4.77E−03	2.65E−03	4.16E−04
95.00	1.38E+00	9.67E−01	9.50E−02	1.19E−02	4.20E−03	2.31E−03	3.68E−04
105.00	1.29E+00	8.96E−01	8.54E−02	1.05E−02	3.48E−03	1.89E−03	3.08E−04
120.00	1.29E+00	8.95E−01	8.35E−02	9.42E−03	2.93E−03	1.57E−03	2.64E−04
135.00	1.36E+00	9.46E−01	8.73E−02	8.90E−03	2.65E−03	1.41E−03	2.43E−04
150.00	1.43E+00	1.00E+00	9.22E−02	8.61E−03	2.49E−03	1.32E−03	2.32E−04
165.00	1.49E+00	1.04E+00	9.58E−02	8.46E−03	2.41E−03	1.27E−03	2.27E−04
180.00	1.51E+00	1.06E+00	9.71E−02	8.41E−03	2.39E−03	1.26E−03	2.25E−04
total	9.35E+01	7.42E+01	1.64E+01	3.71E+00	2.22E+00	1.72E+00	8.70E−01
rel ff	9.92E+01	7.51E+01	1.59E+01	3.74E+00	2.27E+00	1.77E+00	9.00E−01
nrl ff	1.03E+02	7.82E+01	1.68E+01	4.00E+00	2.43E+00	1.90E+00	9.68E−01

TABLE 1. Predicted *S*-matrix differential elastic scattering cross sections for photon energies (50.0, 59.54, 145.4, 316.5, 411.8, 468.1, 661.6, 778.9, 964.0, 1004.8, 1112.1, 1274.5, 1408.0 and 1500.0). The angle integrated total cross sections for each element and energies are presented. ''total'' represents total cross sections from this work, ''rel ff'' represents total cross sections calculated from the relativistic form factor and ''nrl ff'' represents total cross sections calculated from the nonrelativistic form factor—Continued[a]

θ (deg)	Photon energy (keV)						
	778.9	964.0	1004.8	1112.1	1274.5	1408.0	1500.0
Promethium ($Z=61$)							
0.00	2.91E+02	2.91E+02	2.91E+02	2.91E+02	2.91E+02	2.90E+02	2.90E+02
0.01	2.91E+02	2.90E+02	2.90E+02	2.90E+02	2.90E+02	2.90E+02	2.90E+02
0.02	2.90E+02	2.90E+02	2.89E+02	2.89E+02	2.88E+02	2.88E+02	2.87E+02
0.04	2.88E+02	2.86E+02	2.85E+02	2.84E+02	2.82E+02	2.80E+02	2.79E+02
0.06	2.84E+02	2.80E+02	2.79E+02	2.77E+02	2.73E+02	2.70E+02	2.67E+02
0.10	2.73E+02	2.66E+02	2.64E+02	2.59E+02	2.53E+02	2.47E+02	2.44E+02
0.20	2.42E+02	2.27E+02	2.23E+02	2.15E+02	2.02E+02	1.93E+02	1.86E+02
0.30	2.11E+02	1.90E+02	1.86E+02	1.74E+02	1.58E+02	1.46E+02	1.37E+02
0.40	1.82E+02	1.57E+02	1.52E+02	1.39E+02	1.23E+02	1.11E+02	1.05E+02
0.50	1.56E+02	1.30E+02	1.25E+02	1.12E+02	9.71E+01	8.71E+01	8.15E+01
0.60	1.34E+02	1.08E+02	1.03E+02	9.20E+01	7.79E+01	6.89E+01	6.38E+01
0.70	1.15E+02	9.12E+01	8.67E+01	7.62E+01	6.32E+01	5.47E+01	4.98E+01
0.80	1.00E+02	7.74E+01	7.33E+01	6.37E+01	5.18E+01	4.40E+01	3.94E+01
1.00	7.65E+01	5.67E+01	5.32E+01	4.53E+01	3.60E+01	3.01E+01	2.67E+01
1.20	5.93E+01	4.23E+01	3.95E+01	3.33E+01	2.65E+01	2.27E+01	2.07E+01
1.50	4.17E+01	2.89E+01	2.69E+01	2.27E+01	1.84E+01	1.63E+01	1.54E+01
1.70	3.39E+01	2.36E+01	2.20E+01	1.86E+01	1.49E+01	1.29E+01	1.19E+01
2.00	2.60E+01	1.84E+01	1.71E+01	1.44E+01	1.10E+01	8.60E+00	7.11E+00
2.50	1.81E+01	1.26E+01	1.17E+01	9.40E+00	6.36E+00	4.18E+00	2.92E+00
3.00	1.30E+01	8.30E+00	7.52E+00	5.76E+00	3.71E+00	2.45E+00	1.77E+00
3.50	9.32E+00	5.28E+00	4.69E+00	3.50E+00	2.37E+00	1.85E+00	1.63E+00
4.00	6.60E+00	3.46E+00	3.05E+00	2.27E+00	1.69E+00	1.58E+00	1.69E+00
5.00	3.51E+00	1.90E+00	1.70E+00	1.32E+00	1.05E+00	1.01E+00	1.07E+00
6.00	2.17E+00	1.36E+00	1.25E+00	1.00E+00	7.03E−01	4.83E−01	3.48E−01
7.00	1.53E+00	1.03E+00	9.45E−01	7.44E−01	4.49E−01	2.35E−01	1.27E−01
8.00	1.15E+00	7.26E−01	6.57E−01	4.93E−01	2.77E−01	1.39E−01	7.38E−02
9.00	8.70E−01	4.87E−01	4.29E−01	3.07E−01	1.75E−01	1.01E−01	6.47E−02
10.00	6.52E−01	3.22E−01	2.78E−01	1.93E−01	1.18E−01	8.45E−02	6.99E−02
12.50	3.10E−01	1.35E−01	1.15E−01	8.13E−02	6.05E−02	6.24E−02	7.61E−02
15.00	1.62E−01	7.97E−02	7.02E−02	5.32E−02	4.08E−02	3.80E−02	3.93E−02
17.50	9.91E−02	5.81E−02	5.29E−02	4.20E−02	2.91E−02	1.97E−02	1.39E−02
20.00	6.90E−02	4.45E−02	4.10E−02	3.25E−02	1.98E−02	1.02E−02	5.37E−03
22.50	5.18E−02	3.33E−02	3.03E−02	2.31E−02	1.26E−02	5.65E−03	2.62E−03
25.00	4.02E−02	2.39E−02	2.13E−02	1.52E−02	7.62E−03	3.29E−03	1.52E−03
27.50	3.13E−02	1.67E−02	1.45E−02	9.67E−03	4.52E−03	1.97E−03	9.65E−04
30.00	2.41E−02	1.15E−02	9.69E−03	6.05E−03	2.68E−03	1.20E−03	6.31E−04
35.00	1.39E−02	5.34E−03	4.30E−03	2.39E−03	9.58E−04	4.40E−04	2.54E−04
40.00	7.79E−03	2.52E−03	1.96E−03	1.00E−03	3.71E−04	1.70E−04	1.02E−04
45.00	4.33E−03	1.23E−03	9.37E−04	4.57E−04	1.62E−04	7.50E−05	4.65E−05
50.00	2.44E−03	6.37E−04	4.77E−04	2.27E−04	8.07E−05	3.85E−05	2.49E−05
55.00	1.42E−03	3.52E−04	2.63E−04	1.27E−04	4.80E−05	2.54E−05	1.81E−05
60.00	8.67E−04	2.13E−04	1.61E−04	8.04E−05	3.41E−05	2.08E−05	1.68E−05
65.00	5.63E−04	1.41E−04	1.08E−04	5.67E−05	2.70E−05	1.88E−05	1.70E−05
70.00	3.93E−04	1.03E−04	8.01E−05	4.45E−05	2.36E−05	1.81E−05	1.77E−05
75.00	2.93E−04	8.21E−05	6.48E−05	3.80E−05	2.19E−05	1.80E−05	1.82E−05
80.00	2.34E−04	6.99E−05	5.61E−05	3.45E−05	2.11E−05	1.79E−05	1.81E−05
85.00	1.96E−04	6.23E−05	5.09E−05	3.25E−05	2.10E−05	1.81E−05	1.83E−05
90.00	1.71E−04	5.79E−05	4.79E−05	3.17E−05	2.12E−05	1.85E−05	1.85E−05
95.00	1.55E−04	5.49E−05	4.60E−05	3.13E−05	2.16E−05	1.89E−05	1.87E−05
105.00	1.35E−04	5.20E−05	4.44E−05	3.16E−05	2.29E−05	2.02E−05	1.97E−05
120.00	1.21E−04	5.08E−05	4.42E−05	3.30E−05	2.52E−05	2.25E−05	2.16E−05
135.00	1.15E−04	5.19E−05	4.59E−05	3.55E−05	2.80E−05	2.48E−05	2.32E−05
150.00	1.13E−04	5.33E−05	4.76E−05	3.77E−05	3.03E−05	2.68E−05	2.45E−05
165.00	1.12E−04	5.45E−05	4.89E−05	3.94E−05	3.21E−05	2.83E−05	2.56E−05
180.00	1.12E−04	5.49E−05	4.94E−05	4.00E−05	3.28E−05	2.89E−05	2.61E−05
total	6.26E−01	4.10E−01	3.78E−01	3.09E−01	2.34E−01	1.90E−01	1.70E−01
rel ff	6.54E−01	4.30E−01	3.96E−01	3.23E−01	2.46E−01	2.02E−01	1.79E−01
nrl ff	7.04E−01	4.62E−01	4.26E−01	3.48E−01	2.65E−01	2.18E−01	1.93E−01

TABLE 1. Predicted *S*-matrix differential elastic scattering cross sections for photon energies (50.0, 59.54, 145.4, 316.5, 411.8, 468.1, 661.6, 778.9, 964.0, 1004.8, 1112.1, 1274.5, 1408.0 and 1500.0). The angle integrated total cross sections for each element and energies are presented. ''total'' represents total cross sections from this work, ''rel ff'' represents total cross sections calculated from the relativistic form factor and ''nrl ff'' represents total cross sections calculated from the nonrelativistic form factor—Continued[a]

θ (deg)	Photon energy (keV)						
	50.0	59.5	145.4	316.5	411.8	468.1	661.6
Samarium ($Z=62$)							
0.00	2.96E+02	2.98E+02	3.03E+02	3.01E+02	3.01E+02	3.01E+02	3.00E+02
0.01	2.96E+02	2.98E+02	3.03E+02	3.01E+02	3.01E+02	3.01E+02	3.00E+02
0.02	2.97E+02	2.98E+02	3.03E+02	3.01E+02	3.01E+02	3.00E+02	3.00E+02
0.04	2.96E+02	2.98E+02	3.03E+02	3.01E+02	3.00E+02	3.00E+02	2.98E+02
0.06	2.96E+02	2.98E+02	3.03E+02	3.00E+02	2.99E+02	2.98E+02	2.95E+02
0.10	2.96E+02	2.97E+02	3.03E+02	2.98E+02	2.95E+02	2.94E+02	2.87E+02
0.20	2.96E+02	2.97E+02	3.00E+02	2.89E+02	2.82E+02	2.77E+02	2.61E+02
0.30	2.96E+02	2.97E+02	2.97E+02	2.77E+02	2.65E+02	2.58E+02	2.34E+02
0.40	2.95E+02	2.96E+02	2.92E+02	2.64E+02	2.48E+02	2.38E+02	2.08E+02
0.50	2.94E+02	2.95E+02	2.88E+02	2.51E+02	2.31E+02	2.20E+02	1.83E+02
0.60	2.94E+02	2.93E+02	2.82E+02	2.38E+02	2.15E+02	2.02E+02	1.61E+02
0.70	2.93E+02	2.92E+02	2.76E+02	2.25E+02	1.99E+02	1.85E+02	1.42E+02
0.80	2.92E+02	2.90E+02	2.70E+02	2.12E+02	1.84E+02	1.69E+02	1.25E+02
1.00	2.89E+02	2.87E+02	2.57E+02	1.89E+02	1.57E+02	1.41E+02	9.85E+01
1.20	2.86E+02	2.83E+02	2.45E+02	1.67E+02	1.34E+02	1.18E+02	7.85E+01
1.50	2.80E+02	2.76E+02	2.28E+02	1.39E+02	1.07E+02	9.18E+01	5.68E+01
1.70	2.76E+02	2.71E+02	2.16E+02	1.24E+02	9.23E+01	7.83E+01	4.64E+01
2.00	2.70E+02	2.63E+02	1.99E+02	1.04E+02	7.49E+01	6.22E+01	3.52E+01
2.50	2.60E+02	2.51E+02	1.73E+02	7.90E+01	5.38E+01	4.38E+01	2.42E+01
3.00	2.51E+02	2.39E+02	1.51E+02	6.10E+01	3.97E+01	3.21E+01	1.81E+01
3.50	2.41E+02	2.27E+02	1.31E+02	4.79E+01	3.05E+01	2.47E+01	1.39E+01
4.00	2.31E+02	2.15E+02	1.15E+02	3.84E+01	2.45E+01	1.97E+01	1.06E+01
5.00	2.10E+02	1.92E+02	8.88E+01	2.63E+01	1.71E+01	1.33E+01	5.91E+00
6.00	1.91E+02	1.71E+02	6.96E+01	1.93E+01	1.23E+01	9.15E+00	3.45E+00
7.00	1.73E+02	1.52E+02	5.52E+01	1.47E+01	8.67E+00	6.25E+00	2.29E+00
8.00	1.58E+02	1.35E+02	4.43E+01	1.14E+01	6.01E+00	4.30E+00	1.70E+00
9.00	1.43E+02	1.20E+02	3.62E+01	8.78E+00	4.24E+00	3.04E+00	1.35E+00
10.00	1.29E+02	1.08E+02	3.02E+01	6.78E+00	3.12E+00	2.26E+00	1.08E+00
12.50	9.86E+01	8.22E+01	2.10E+01	3.66E+00	1.81E+00	1.32E+00	5.86E−01
15.00	7.53E+01	6.35E+01	1.55E+01	2.21E+00	1.25E+00	8.87E−01	3.05E−01
17.50	5.88E+01	4.95E+01	1.15E+01	1.50E+00	8.75E−01	5.98E−01	1.72E−01
20.00	4.74E+01	3.91E+01	8.42E+00	1.10E+00	5.90E−01	3.92E−01	1.11E−01
22.50	3.92E+01	3.14E+01	6.07E+00	8.35E−01	3.90E−01	2.56E−01	7.99E−02
25.00	3.32E+01	2.58E+01	4.42E+00	6.32E−01	2.62E−01	1.72E−01	6.19E−02
27.50	2.85E+01	2.16E+01	3.32E+00	4.74E−01	1.82E−01	1.21E−01	4.95E−02
30.00	2.47E+01	1.84E+01	2.58E+00	3.55E−01	1.33E−01	9.02E−02	4.00E−02
35.00	1.85E+01	1.38E+01	1.74E+00	2.03E−01	8.21E−02	5.71E−02	2.59E−02
40.00	1.38E+01	1.04E+01	1.29E+00	1.23E−01	5.73E−02	4.03E−02	1.62E−02
45.00	1.02E+01	7.82E+00	9.78E−01	8.14E−02	4.25E−02	2.97E−02	9.98E−03
50.00	7.53E+00	5.81E+00	7.41E−01	5.80E−02	3.21E−02	2.20E−02	6.13E−03
55.00	5.56E+00	4.30E+00	5.55E−01	4.38E−02	2.44E−02	1.62E−02	3.82E−03
60.00	4.17E+00	3.21E+00	4.14E−01	3.45E−02	1.85E−02	1.19E−02	2.45E−03
65.00	3.20E+00	2.44E+00	3.11E−01	2.80E−02	1.42E−02	8.83E−03	1.64E−03
70.00	2.53E+00	1.91E+00	2.37E−01	2.33E−02	1.10E−02	6.66E−03	1.15E−03
75.00	2.06E+00	1.54E+00	1.87E−01	1.98E−02	8.77E−03	5.16E−03	8.48E−04
80.00	1.74E+00	1.28E+00	1.52E−01	1.71E−02	7.14E−03	4.11E−03	6.62E−04
85.00	1.52E+00	1.11E+00	1.28E−01	1.52E−02	5.98E−03	3.39E−03	5.41E−04
90.00	1.36E+00	9.86E−01	1.12E−01	1.37E−02	5.15E−03	2.89E−03	4.63E−04
95.00	1.26E+00	9.06E−01	1.01E−01	1.26E−02	4.56E−03	2.53E−03	4.09E−04
105.00	1.15E+00	8.24E−01	9.05E−02	1.12E−02	3.80E−03	2.08E−03	3.43E−04
120.00	1.13E+00	8.10E−01	8.77E−02	1.01E−02	3.21E−03	1.74E−03	2.94E−04
135.00	1.18E+00	8.49E−01	9.13E−02	9.61E−03	2.92E−03	1.56E−03	2.70E−04
150.00	1.25E+00	8.96E−01	9.61E−02	9.33E−03	2.75E−03	1.46E−03	2.58E−04
165.00	1.29E+00	9.30E−01	9.98E−02	9.18E−03	2.66E−03	1.41E−03	2.52E−04
180.00	1.31E+00	9.43E−01	1.01E−01	9.14E−03	2.64E−03	1.40E−03	2.50E−04
total	9.35E+01	7.49E+01	1.72E+01	3.88E+00	2.32E+00	1.80E+00	9.08E−01
rel ff	1.03E+02	7.83E+01	1.66E+01	3.91E+00	2.37E+00	1.85E+00	9.42E−01
nrl ff	1.07E+02	8.16E+01	1.76E+01	4.19E+00	2.54E+00	1.99E+00	1.01E+00

TABLE 1. Predicted *S*-matrix differential elastic scattering cross sections for photon energies (50.0, 59.54, 145.4, 316.5, 411.8, 468.1, 661.6, 778.9, 964.0, 1004.8, 1112.1, 1274.5, 1408.0 and 1500.0). The angle integrated total cross sections for each element and energies are presented. ''total'' represents total cross sections from this work, ''rel ff'' represents total cross sections calculated from the relativistic form factor and ''nrl ff'' represents total cross sections calculated from the nonrelativistic form factor—Continued[a]

θ (deg)	Photon energy (keV)						
	778.9	964.0	1004.8	1112.1	1274.5	1408.0	1500.0
Samarium ($Z=62$)							
0.00	3.00E+02	3.00E+02	3.00E+02	3.00E+02	3.00E+02	3.00E+02	3.00E+02
0.01	3.00E+02	3.00E+02	3.00E+02	3.00E+02	2.99E+02	2.99E+02	2.99E+02
0.02	3.00E+02	2.99E+02	2.99E+02	2.99E+02	2.98E+02	2.97E+02	2.96E+02
0.04	2.97E+02	2.95E+02	2.95E+02	2.94E+02	2.92E+02	2.90E+02	2.89E+02
0.06	2.93E+02	2.90E+02	2.89E+02	2.87E+02	2.83E+02	2.79E+02	2.77E+02
0.10	2.83E+02	2.75E+02	2.73E+02	2.69E+02	2.62E+02	2.57E+02	2.53E+02
0.20	2.51E+02	2.35E+02	2.32E+02	2.23E+02	2.11E+02	2.01E+02	1.94E+02
0.30	2.19E+02	1.98E+02	1.94E+02	1.82E+02	1.65E+02	1.53E+02	1.44E+02
0.40	1.90E+02	1.64E+02	1.59E+02	1.46E+02	1.29E+02	1.17E+02	1.10E+02
0.50	1.63E+02	1.36E+02	1.31E+02	1.18E+02	1.02E+02	9.15E+01	8.53E+01
0.60	1.41E+02	1.14E+02	1.09E+02	9.67E+01	8.19E+01	7.22E+01	6.68E+01
0.70	1.21E+02	9.59E+01	9.12E+01	8.01E+01	6.63E+01	5.73E+01	5.21E+01
0.80	1.05E+02	8.13E+01	7.70E+01	6.67E+01	5.42E+01	4.60E+01	4.12E+01
1.00	8.04E+01	5.94E+01	5.57E+01	4.73E+01	3.74E+01	3.12E+01	2.77E+01
1.20	6.22E+01	4.42E+01	4.12E+01	3.46E+01	2.73E+01	2.32E+01	2.11E+01
1.50	4.35E+01	3.00E+01	2.79E+01	2.34E+01	1.89E+01	1.67E+01	1.57E+01
1.70	3.52E+01	2.43E+01	2.26E+01	1.90E+01	1.53E+01	1.33E+01	1.24E+01
2.00	2.68E+01	1.88E+01	1.75E+01	1.47E+01	1.13E+01	9.10E+00	7.71E+00
2.50	1.85E+01	1.30E+01	1.20E+01	9.77E+00	6.72E+00	4.50E+00	3.18E+00
3.00	1.34E+01	8.73E+00	7.94E+00	6.14E+00	3.97E+00	2.58E+00	1.82E+00
3.50	9.72E+00	5.65E+00	5.04E+00	3.77E+00	2.52E+00	1.88E+00	1.57E+00
4.00	6.96E+00	3.71E+00	3.27E+00	2.43E+00	1.77E+00	1.58E+00	1.61E+00
5.00	3.72E+00	1.98E+00	1.77E+00	1.36E+00	1.08E+00	1.05E+00	1.14E+00
6.00	2.28E+00	1.39E+00	1.27E+00	1.01E+00	7.27E−01	5.34E−01	4.15E−01
7.00	1.59E+00	1.05E+00	9.67E−01	7.65E−01	4.73E−01	2.60E−01	1.47E−01
8.00	1.19E+00	7.62E−01	6.92E−01	5.25E−01	2.97E−01	1.48E−01	7.79E−02
9.00	9.04E−01	5.22E−01	4.63E−01	3.35E−01	1.89E−01	1.04E−01	6.27E−02
10.00	6.84E−01	3.49E−01	3.03E−01	2.11E−01	1.26E−01	8.48E−02	6.51E−02
12.50	3.32E−01	1.44E−01	1.23E−01	8.61E−02	6.26E−02	6.28E−02	7.46E−02
15.00	1.73E−01	8.25E−02	7.22E−02	5.40E−02	4.15E−02	4.00E−02	4.33E−02
17.50	1.04E−01	5.90E−02	5.34E−02	4.21E−02	2.98E−02	2.14E−02	1.62E−02
20.00	7.15E−02	4.53E−02	4.16E−02	3.30E−02	2.06E−02	1.12E−02	6.14E−03
22.50	5.33E−02	3.43E−02	3.14E−02	2.41E−02	1.33E−02	6.11E−03	2.86E−03
25.00	4.13E−02	2.51E−02	2.25E−02	1.63E−02	8.23E−03	3.54E−03	1.61E−03
27.50	3.23E−02	1.77E−02	1.55E−02	1.05E−02	4.94E−03	2.12E−03	1.01E−03
30.00	2.51E−02	1.23E−02	1.04E−02	6.62E−03	2.95E−03	1.30E−03	6.63E−04
35.00	1.47E−02	5.79E−03	4.68E−03	2.64E−03	1.07E−03	4.84E−04	2.75E−04
40.00	8.33E−03	2.76E−03	2.15E−03	1.11E−03	4.15E−04	1.90E−04	1.13E−04
45.00	4.68E−03	1.36E−03	1.03E−03	5.08E−04	1.82E−04	8.42E−05	5.22E−05
50.00	2.66E−03	7.05E−04	5.29E−04	2.53E−04	9.04E−05	4.32E−05	2.79E−05
55.00	1.56E−03	3.92E−04	2.93E−04	1.41E−04	5.36E−05	2.83E−05	2.01E−05
60.00	9.58E−04	2.38E−04	1.79E−04	8.96E−05	3.78E−05	2.29E−05	1.85E−05
65.00	6.24E−04	1.58E−04	1.20E−04	6.31E−05	2.98E−05	2.06E−05	1.85E−05
70.00	4.36E−04	1.15E−04	8.92E−05	4.95E−05	2.60E−05	1.98E−05	1.92E−05
75.00	3.26E−04	9.14E−05	7.21E−05	4.21E−05	2.40E−05	1.95E−05	1.96E−05
80.00	2.60E−04	7.77E−05	6.23E−05	3.81E−05	2.31E−05	1.94E−05	1.96E−05
85.00	2.18E−04	6.92E−05	5.64E−05	3.59E−05	2.28E−05	1.95E−05	1.97E−05
90.00	1.91E−04	6.42E−05	5.30E−05	3.48E−05	2.30E−05	1.99E−05	1.98E−05
95.00	1.72E−04	6.08E−05	5.08E−05	3.43E−05	2.34E−05	2.03E−05	2.01E−05
105.00	1.50E−04	5.73E−05	4.87E−05	3.44E−05	2.46E−05	2.16E−05	2.10E−05
120.00	1.34E−04	5.57E−05	4.83E−05	3.58E−05	2.70E−05	2.40E−05	2.30E−05
135.00	1.28E−04	5.66E−05	4.98E−05	3.82E−05	2.97E−05	2.63E−05	2.45E−05
150.00	1.24E−04	5.79E−05	5.15E−05	4.04E−05	3.21E−05	2.82E−05	2.59E−05
165.00	1.23E−04	5.90E−05	5.28E−05	4.20E−05	3.38E−05	2.97E−05	2.70E−05
180.00	1.23E−04	5.94E−05	5.33E−05	4.27E−05	3.45E−05	3.03E−05	2.75E−05
total	6.54E−01	4.29E−01	3.95E−01	3.23E−01	2.44E−01	1.99E−01	1.77E−01
rel ff	6.84E−01	4.49E−01	4.14E−01	3.38E−01	2.57E−01	2.12E−01	1.87E−01
nrl ff	7.37E−01	4.84E−01	4.46E−01	3.65E−01	2.78E−01	2.29E−01	2.02E−01

TABLE 1. Predicted *S*-matrix differential elastic scattering cross sections for photon energies (50.0, 59.54, 145.4, 316.5, 411.8, 468.1, 661.6, 778.9, 964.0, 1004.8, 1112.1, 1274.5, 1408.0 and 1500.0). The angle integrated total cross sections for each element and energies are presented. ''total'' represents total cross sections from this work, ''rel ff'' represents total cross sections calculated from the relativistic form factor and ''nrl ff'' represents total cross sections calculated from the nonrelativistic form factor—Continued[a]

θ (deg)	Photon energy (keV)						
	50.0	59.5	145.4	316.5	411.8	468.1	661.6
Europium ($Z=63$)							
0.00	3.04E+02	3.06E+02	3.13E+02	3.11E+02	3.11E+02	3.10E+02	3.10E+02
0.01	3.04E+02	3.06E+02	3.13E+02	3.11E+02	3.10E+02	3.10E+02	3.10E+02
0.02	3.04E+02	3.06E+02	3.13E+02	3.11E+02	3.10E+02	3.10E+02	3.10E+02
0.04	3.04E+02	3.05E+02	3.13E+02	3.10E+02	3.10E+02	3.09E+02	3.08E+02
0.06	3.04E+02	3.05E+02	3.13E+02	3.10E+02	3.09E+02	3.08E+02	3.05E+02
0.10	3.04E+02	3.05E+02	3.12E+02	3.08E+02	3.05E+02	3.03E+02	2.97E+02
0.20	3.04E+02	3.05E+02	3.10E+02	2.99E+02	2.91E+02	2.87E+02	2.70E+02
0.30	3.03E+02	3.04E+02	3.07E+02	2.87E+02	2.74E+02	2.67E+02	2.42E+02
0.40	3.03E+02	3.04E+02	3.02E+02	2.73E+02	2.57E+02	2.47E+02	2.16E+02
0.50	3.02E+02	3.03E+02	2.97E+02	2.60E+02	2.40E+02	2.28E+02	1.91E+02
0.60	3.01E+02	3.01E+02	2.91E+02	2.47E+02	2.23E+02	2.10E+02	1.69E+02
0.70	3.00E+02	3.00E+02	2.86E+02	2.34E+02	2.07E+02	1.93E+02	1.49E+02
0.80	2.99E+02	2.98E+02	2.79E+02	2.21E+02	1.92E+02	1.76E+02	1.31E+02
1.00	2.97E+02	2.95E+02	2.67E+02	1.97E+02	1.64E+02	1.48E+02	1.03E+02
1.20	2.94E+02	2.91E+02	2.54E+02	1.75E+02	1.40E+02	1.24E+02	8.24E+01
1.50	2.88E+02	2.84E+02	2.37E+02	1.46E+02	1.12E+02	9.64E+01	5.95E+01
1.70	2.84E+02	2.79E+02	2.25E+02	1.30E+02	9.69E+01	8.21E+01	4.84E+01
2.00	2.78E+02	2.71E+02	2.08E+02	1.09E+02	7.85E+01	6.51E+01	3.66E+01
2.50	2.68E+02	2.59E+02	1.81E+02	8.29E+01	5.63E+01	4.56E+01	2.49E+01
3.00	2.58E+02	2.46E+02	1.58E+02	6.39E+01	4.13E+01	3.33E+01	1.85E+01
3.50	2.48E+02	2.34E+02	1.38E+02	5.00E+01	3.16E+01	2.55E+01	1.43E+01
4.00	2.37E+02	2.22E+02	1.20E+02	4.00E+01	2.52E+01	2.02E+01	1.10E+01
5.00	2.17E+02	1.99E+02	9.31E+01	2.72E+01	1.76E+01	1.37E+01	6.28E+00
6.00	1.97E+02	1.77E+02	7.29E+01	1.98E+01	1.28E+01	9.52E+00	3.66E+00
7.00	1.80E+02	1.58E+02	5.77E+01	1.51E+01	9.10E+00	6.59E+00	2.39E+00
8.00	1.63E+02	1.40E+02	4.62E+01	1.18E+01	6.38E+00	4.56E+00	1.76E+00
9.00	1.49E+02	1.25E+02	3.77E+01	9.16E+00	4.51E+00	3.23E+00	1.38E+00
10.00	1.34E+02	1.12E+02	3.13E+01	7.12E+00	3.31E+00	2.39E+00	1.12E+00
12.50	1.03E+02	8.53E+01	2.15E+01	3.88E+00	1.87E+00	1.36E+00	6.21E−01
15.00	7.83E+01	6.57E+01	1.60E+01	2.32E+00	1.29E+00	9.16E−01	3.27E−01
17.50	6.07E+01	5.10E+01	1.20E+01	1.57E+00	9.12E−01	6.26E−01	1.84E−01
20.00	4.84E+01	4.01E+01	8.84E+00	1.14E+00	6.24E−01	4.16E−01	1.16E−01
22.50	3.97E+01	3.21E+01	6.44E+00	8.67E−01	4.17E−01	2.74E−01	8.28E−02
25.00	3.33E+01	2.62E+01	4.71E+00	6.61E−01	2.81E−01	1.84E−01	6.36E−02
27.50	2.85E+01	2.18E+01	3.53E+00	5.00E−01	1.95E−01	1.29E−01	5.08E−02
30.00	2.45E+01	1.85E+01	2.73E+00	3.77E−01	1.42E−01	9.51E−02	4.12E−02
35.00	1.84E+01	1.37E+01	1.81E+00	2.16E−01	8.55E−02	5.91E−02	2.69E−02
40.00	1.38E+01	1.04E+01	1.33E+00	1.31E−01	5.90E−02	4.14E−02	1.71E−02
45.00	1.03E+01	7.86E+00	1.01E+00	8.59E−02	4.37E−02	3.05E−02	1.06E−02
50.00	7.58E+00	5.88E+00	7.73E−01	6.06E−02	3.31E−02	2.28E−02	6.58E−03
55.00	5.60E+00	4.37E+00	5.85E−01	4.54E−02	2.53E−02	1.69E−02	4.13E−03
60.00	4.19E+00	3.26E+00	4.40E−01	3.56E−02	1.93E−02	1.25E−02	2.67E−03
65.00	3.19E+00	2.47E+00	3.32E−01	2.89E−02	1.49E−02	9.37E−03	1.79E−03
70.00	2.50E+00	1.91E+00	2.55E−01	2.41E−02	1.17E−02	7.12E−03	1.26E−03
75.00	2.01E+00	1.53E+00	2.01E−01	2.05E−02	9.33E−03	5.54E−03	9.35E−04
80.00	1.68E+00	1.26E+00	1.63E−01	1.79E−02	7.64E−03	4.45E−03	7.31E−04
85.00	1.44E+00	1.07E+00	1.37E−01	1.59E−02	6.43E−03	3.68E−03	5.99E−04
90.00	1.28E+00	9.46E−01	1.20E−01	1.44E−02	5.56E−03	3.15E−03	5.13E−04
95.00	1.17E+00	8.60E−01	1.08E−01	1.33E−02	4.93E−03	2.77E−03	4.54E−04
105.00	1.05E+00	7.69E−01	9.58E−02	1.19E−02	4.13E−03	2.28E−03	3.81E−04
120.00	1.02E+00	7.44E−01	9.21E−02	1.08E−02	3.52E−03	1.91E−03	3.27E−04
135.00	1.05E+00	7.74E−01	9.55E−02	1.03E−02	3.20E−03	1.73E−03	3.00E−04
150.00	1.11E+00	8.14E−01	1.00E−01	1.01E−02	3.03E−03	1.62E−03	2.86E−04
165.00	1.14E+00	8.44E−01	1.04E−01	9.94E−03	2.93E−03	1.56E−03	2.79E−04
180.00	1.16E+00	8.54E−01	1.05E−01	9.90E−03	2.90E−03	1.55E−03	2.77E−04
total	9.41E+01	7.60E+01	1.79E+01	4.05E+00	2.43E+00	1.88E+00	9.48E−01
rel ff	1.08E+02	8.16E+01	1.73E+01	4.08E+00	2.47E+00	1.93E+00	9.84E−01
nrl ff	1.12E+02	8.50E+01	1.84E+01	4.38E+00	2.66E+00	2.08E+00	1.06E+00

TABLE 1. Predicted *S*-matrix differential elastic scattering cross sections for photon energies (50.0, 59.54, 145.4, 316.5, 411.8, 468.1, 661.6, 778.9, 964.0, 1004.8, 1112.1, 1274.5, 1408.0 and 1500.0). The angle integrated total cross sections for each element and energies are presented. ''total'' represents total cross sections from this work, ''rel ff'' represents total cross sections calculated from the relativistic form factor and ''nrl ff'' represents total cross sections calculated from the nonrelativistic form factor—Continued[a]

θ (deg)	Photon energy (keV)						
	778.9	964.0	1004.8	1112.1	1274.5	1408.0	1500.0
Europium ($Z=63$)							
0.00	3.10E+02	3.10E+02	3.10E+02	3.10E+02	3.10E+02	3.09E+02	3.09E+02
0.01	3.10E+02	3.09E+02	3.09E+02	3.09E+02	3.09E+02	3.09E+02	3.09E+02
0.02	3.09E+02	3.09E+02	3.09E+02	3.08E+02	3.07E+02	3.07E+02	3.06E+02
0.04	3.07E+02	3.05E+02	3.04E+02	3.03E+02	3.01E+02	3.00E+02	2.98E+02
0.06	3.03E+02	3.00E+02	2.99E+02	2.96E+02	2.93E+02	2.89E+02	2.86E+02
0.10	2.92E+02	2.85E+02	2.83E+02	2.78E+02	2.71E+02	2.66E+02	2.62E+02
0.20	2.60E+02	2.44E+02	2.41E+02	2.32E+02	2.19E+02	2.09E+02	2.02E+02
0.30	2.28E+02	2.06E+02	2.02E+02	1.90E+02	1.73E+02	1.60E+02	1.51E+02
0.40	1.98E+02	1.72E+02	1.67E+02	1.53E+02	1.36E+02	1.23E+02	1.15E+02
0.50	1.71E+02	1.43E+02	1.38E+02	1.24E+02	1.07E+02	9.59E+01	8.92E+01
0.60	1.47E+02	1.19E+02	1.14E+02	1.02E+02	8.59E+01	7.56E+01	6.98E+01
0.70	1.27E+02	1.01E+02	9.57E+01	8.40E+01	6.95E+01	6.00E+01	5.45E+01
0.80	1.11E+02	8.53E+01	8.07E+01	6.99E+01	5.67E+01	4.80E+01	4.30E+01
1.00	8.43E+01	6.21E+01	5.82E+01	4.93E+01	3.89E+01	3.24E+01	2.87E+01
1.20	6.51E+01	4.61E+01	4.29E+01	3.59E+01	2.82E+01	2.39E+01	2.16E+01
1.50	4.54E+01	3.11E+01	2.88E+01	2.41E+01	1.93E+01	1.70E+01	1.61E+01
1.70	3.66E+01	2.50E+01	2.32E+01	1.95E+01	1.57E+01	1.38E+01	1.29E+01
2.00	2.77E+01	1.92E+01	1.79E+01	1.50E+01	1.17E+01	9.60E+00	8.31E+00
2.50	1.90E+01	1.34E+01	1.24E+01	1.01E+01	7.08E+00	4.83E+00	3.47E+00
3.00	1.39E+01	9.16E+00	8.37E+00	6.52E+00	4.23E+00	2.71E+00	1.88E+00
3.50	1.01E+01	6.02E+00	5.39E+00	4.05E+00	2.67E+00	1.92E+00	1.53E+00
4.00	7.33E+00	3.97E+00	3.51E+00	2.60E+00	1.85E+00	1.58E+00	1.54E+00
5.00	3.94E+00	2.07E+00	1.84E+00	1.41E+00	1.11E+00	1.10E+00	1.22E+00
6.00	2.39E+00	1.42E+00	1.29E+00	1.02E+00	7.51E−01	5.86E−01	4.88E−01
7.00	1.65E+00	1.08E+00	9.91E−01	7.86E−01	4.98E−01	2.86E−01	1.70E−01
8.00	1.23E+00	7.98E−01	7.28E−01	5.57E−01	3.18E−01	1.59E−01	8.28E−02
9.00	9.39E−01	5.57E−01	4.97E−01	3.63E−01	2.03E−01	1.07E−01	6.16E−02
10.00	7.17E−01	3.76E−01	3.29E−01	2.31E−01	1.35E−01	8.56E−02	6.14E−02
12.50	3.54E−01	1.54E−01	1.31E−01	9.13E−02	6.50E−02	6.32E−02	7.31E−02
15.00	1.84E−01	8.56E−02	7.45E−02	5.50E−02	4.23E−02	4.20E−02	4.73E−02
17.50	1.09E−01	6.01E−02	5.41E−02	4.23E−02	3.05E−02	2.31E−02	1.86E−02
20.00	7.42E−02	4.62E−02	4.24E−02	3.36E−02	2.14E−02	1.21E−02	6.99E−03
22.50	5.49E−02	3.54E−02	3.24E−02	2.50E−02	1.41E−02	6.59E−03	3.14E−03
25.00	4.25E−02	2.62E−02	2.36E−02	1.73E−02	8.86E−03	3.80E−03	1.71E−03
27.50	3.33E−02	1.87E−02	1.65E−02	1.13E−02	5.39E−03	2.28E−03	1.06E−03
30.00	2.60E−02	1.31E−02	1.12E−02	7.22E−03	3.25E−03	1.41E−03	6.98E−04
35.00	1.55E−02	6.26E−03	5.09E−03	2.91E−03	1.18E−03	5.32E−04	2.96E−04
40.00	8.89E−03	3.01E−03	2.35E−03	1.23E−03	4.63E−04	2.11E−04	1.25E−04
45.00	5.05E−03	1.49E−03	1.14E−03	5.64E−04	2.04E−04	9.43E−05	5.84E−05
50.00	2.89E−03	7.79E−04	5.86E−04	2.82E−04	1.01E−04	4.83E−05	3.13E−05
55.00	1.71E−03	4.34E−04	3.25E−04	1.58E−04	5.98E−05	3.14E−05	2.23E−05
60.00	1.05E−03	2.64E−04	1.99E−04	9.98E−05	4.20E−05	2.53E−05	2.03E−05
65.00	6.90E−04	1.75E−04	1.34E−04	7.02E−05	3.30E−05	2.26E−05	2.02E−05
70.00	4.83E−04	1.28E−04	9.93E−05	5.49E−05	2.86E−05	2.16E−05	2.08E−05
75.00	3.62E−04	1.02E−04	8.02E−05	4.66E−05	2.64E−05	2.13E−05	2.12E−05
80.00	2.89E−04	8.63E−05	6.92E−05	4.20E−05	2.52E−05	2.10E−05	2.12E−05
85.00	2.42E−04	7.68E−05	6.25E−05	3.95E−05	2.49E−05	2.11E−05	2.12E−05
90.00	2.12E−04	7.10E−05	5.86E−05	3.82E−05	2.50E−05	2.14E−05	2.13E−05
95.00	1.92E−04	6.72E−05	5.60E−05	3.76E−05	2.53E−05	2.18E−05	2.15E−05
105.00	1.67E−04	6.31E−05	5.35E−05	3.75E−05	2.65E−05	2.31E−05	2.24E−05
120.00	1.49E−04	6.10E−05	5.27E−05	3.87E−05	2.88E−05	2.55E−05	2.44E−05
135.00	1.41E−04	6.17E−05	5.41E−05	4.11E−05	3.16E−05	2.78E−05	2.60E−05
150.00	1.37E−04	6.29E−05	5.57E−05	4.33E−05	3.40E−05	2.98E−05	2.74E−05
165.00	1.36E−04	6.39E−05	5.70E−05	4.49E−05	3.57E−05	3.13E−05	2.85E−05
180.00	1.35E−04	6.44E−05	5.74E−05	4.55E−05	3.64E−05	3.19E−05	2.89E−05
total	6.83E−01	4.47E−01	4.12E−01	3.37E−01	2.55E−01	2.07E−01	1.85E−01
rel ff	7.15E−01	4.70E−01	4.33E−01	3.53E−01	2.69E−01	2.21E−01	1.96E−01
nrl ff	7.71E−01	5.07E−01	4.67E−01	3.82E−01	2.91E−01	2.39E−01	2.12E−01

TABLE 1. Predicted *S*-matrix differential elastic scattering cross sections for photon energies (50.0, 59.54, 145.4, 316.5, 411.8, 468.1, 661.6, 778.9, 964.0, 1004.8, 1112.1, 1274.5, 1408.0 and 1500.0). The angle integrated total cross sections for each element and energies are presented. ''total'' represents total cross sections from this work, ''rel ff'' represents total cross sections calculated from the relativistic form factor and ''nrl ff'' represents total cross sections calculated from the nonrelativistic form factor—Continued[a]

θ (deg)	Photon energy (keV)						
	50.0	59.5	145.4	316.5	411.8	468.1	661.6
Gadolinium ($Z=64$)							
0.00	3.12E+02	3.14E+02	3.23E+02	3.21E+02	3.20E+02	3.20E+02	3.20E+02
0.01	3.12E+02	3.14E+02	3.23E+02	3.21E+02	3.20E+02	3.20E+02	3.20E+02
0.02	3.12E+02	3.14E+02	3.23E+02	3.21E+02	3.20E+02	3.20E+02	3.19E+02
0.04	3.12E+02	3.14E+02	3.23E+02	3.20E+02	3.20E+02	3.19E+02	3.18E+02
0.06	3.12E+02	3.14E+02	3.22E+02	3.20E+02	3.18E+02	3.18E+02	3.15E+02
0.10	3.12E+02	3.14E+02	3.22E+02	3.17E+02	3.15E+02	3.13E+02	3.07E+02
0.20	3.12E+02	3.13E+02	3.20E+02	3.09E+02	3.01E+02	2.96E+02	2.80E+02
0.30	3.11E+02	3.13E+02	3.17E+02	2.96E+02	2.84E+02	2.76E+02	2.51E+02
0.40	3.11E+02	3.12E+02	3.12E+02	2.83E+02	2.66E+02	2.56E+02	2.24E+02
0.50	3.10E+02	3.11E+02	3.07E+02	2.69E+02	2.49E+02	2.37E+02	1.99E+02
0.60	3.09E+02	3.10E+02	3.01E+02	2.56E+02	2.32E+02	2.18E+02	1.76E+02
0.70	3.08E+02	3.08E+02	2.96E+02	2.42E+02	2.16E+02	2.01E+02	1.55E+02
0.80	3.07E+02	3.06E+02	2.89E+02	2.30E+02	2.00E+02	1.84E+02	1.37E+02
1.00	3.05E+02	3.03E+02	2.76E+02	2.05E+02	1.71E+02	1.54E+02	1.08E+02
1.20	3.02E+02	2.99E+02	2.64E+02	1.82E+02	1.47E+02	1.30E+02	8.62E+01
1.50	2.96E+02	2.92E+02	2.45E+02	1.53E+02	1.17E+02	1.01E+02	6.22E+01
1.70	2.92E+02	2.87E+02	2.34E+02	1.36E+02	1.02E+02	8.60E+01	5.05E+01
2.00	2.86E+02	2.79E+02	2.16E+02	1.14E+02	8.22E+01	6.81E+01	3.80E+01
2.50	2.75E+02	2.66E+02	1.89E+02	8.68E+01	5.88E+01	4.76E+01	2.57E+01
3.00	2.65E+02	2.54E+02	1.65E+02	6.68E+01	4.31E+01	3.46E+01	1.90E+01
3.50	2.55E+02	2.41E+02	1.44E+02	5.22E+01	3.27E+01	2.63E+01	1.48E+01
4.00	2.44E+02	2.29E+02	1.26E+02	4.16E+01	2.59E+01	2.08E+01	1.15E+01
5.00	2.23E+02	2.06E+02	9.76E+01	2.81E+01	1.80E+01	1.41E+01	6.64E+00
6.00	2.04E+02	1.84E+02	7.63E+01	2.04E+01	1.32E+01	9.90E+00	3.88E+00
7.00	1.86E+02	1.64E+02	6.03E+01	1.56E+01	9.53E+00	6.92E+00	2.51E+00
8.00	1.70E+02	1.46E+02	4.82E+01	1.22E+01	6.75E+00	4.82E+00	1.82E+00
9.00	1.54E+02	1.30E+02	3.92E+01	9.54E+00	4.79E+00	3.42E+00	1.42E+00
10.00	1.40E+02	1.16E+02	3.25E+01	7.47E+00	3.50E+00	2.52E+00	1.15E+00
12.50	1.07E+02	8.86E+01	2.21E+01	4.10E+00	1.94E+00	1.41E+00	6.56E−01
15.00	8.14E+01	6.80E+01	1.64E+01	2.45E+00	1.33E+00	9.47E−01	3.50E−01
17.50	6.26E+01	5.27E+01	1.24E+01	1.63E+00	9.50E−01	6.55E−01	1.96E−01
20.00	4.95E+01	4.13E+01	9.27E+00	1.19E+00	6.60E−01	4.41E−01	1.22E−01
22.50	4.03E+01	3.29E+01	6.81E+00	8.99E−01	4.45E−01	2.92E−01	8.59E−02
25.00	3.36E+01	2.67E+01	5.00E+00	6.90E−01	3.00E−01	1.97E−01	6.54E−02
27.50	2.85E+01	2.21E+01	3.74E+00	5.26E−01	2.08E−01	1.37E−01	5.22E−02
30.00	2.45E+01	1.86E+01	2.88E+00	3.99E−01	1.50E−01	1.00E−01	4.24E−02
35.00	1.84E+01	1.38E+01	1.89E+00	2.31E−01	8.92E−02	6.14E−02	2.79E−02
40.00	1.38E+01	1.05E+01	1.37E+00	1.40E−01	6.09E−02	4.26E−02	1.79E−02
45.00	1.03E+01	7.93E+00	1.05E+00	9.07E−02	4.49E−02	3.14E−02	1.13E−02
50.00	7.66E+00	5.96E+00	8.05E−01	6.34E−02	3.41E−02	2.35E−02	7.04E−03
55.00	5.67E+00	4.44E+00	6.15E−01	4.72E−02	2.62E−02	1.76E−02	4.46E−03
60.00	4.23E+00	3.32E+00	4.66E−01	3.68E−02	2.02E−02	1.32E−02	2.90E−03
65.00	3.20E+00	2.50E+00	3.54E−01	2.99E−02	1.57E−02	9.92E−03	1.95E−03
70.00	2.49E+00	1.93E+00	2.73E−01	2.49E−02	1.23E−02	7.59E−03	1.38E−03
75.00	1.98E+00	1.53E+00	2.15E−01	2.13E−02	9.90E−03	5.94E−03	1.03E−03
80.00	1.63E+00	1.25E+00	1.75E−01	1.86E−02	8.15E−03	4.79E−03	8.06E−04
85.00	1.39E+00	1.05E+00	1.47E−01	1.66E−02	6.89E−03	3.98E−03	6.62E−04
90.00	1.22E+00	9.18E−01	1.28E−01	1.51E−02	5.98E−03	3.42E−03	5.68E−04
95.00	1.10E+00	8.27E−01	1.15E−01	1.40E−02	5.33E−03	3.01E−03	5.03E−04
105.00	9.72E−01	7.28E−01	1.01E−01	1.26E−02	4.49E−03	2.50E−03	4.23E−04
120.00	9.27E−01	6.95E−01	9.68E−02	1.16E−02	3.84E−03	2.10E−03	3.63E−04
135.00	9.55E−01	7.17E−01	9.99E−02	1.11E−02	3.51E−03	1.90E−03	3.33E−04
150.00	9.98E−01	7.52E−01	1.05E−01	1.09E−02	3.32E−03	1.79E−03	3.17E−04
165.00	1.03E+00	7.78E−01	1.08E−01	1.07E−02	3.22E−03	1.73E−03	3.09E−04
180.00	1.04E+00	7.87E−01	1.10E−01	1.07E−02	3.19E−03	1.71E−03	3.06E−04
total	9.52E+01	7.73E+01	1.87E+01	4.23E+00	2.53E+00	1.96E+00	9.90E−01
rel ff	1.12E+02	8.48E+01	1.80E+01	4.26E+00	2.58E+00	2.02E+00	1.03E+00
nrl ff	1.16E+02	8.84E+01	1.91E+01	4.57E+00	2.78E+00	2.17E+00	1.11E+00

TABLE 1. Predicted *S*-matrix differential elastic scattering cross sections for photon energies (50.0, 59.54, 145.4, 316.5, 411.8, 468.1, 661.6, 778.9, 964.0, 1004.8, 1112.1, 1274.5, 1408.0 and 1500.0). The angle integrated total cross sections for each element and energies are presented. ''total'' represents total cross sections from this work, ''rel ff'' represents total cross sections calculated from the relativistic form factor and ''nrl ff'' represents total cross sections calculated from the nonrelativistic form factor—Continued[a]

θ (deg)	Photon energy (keV)						
	778.9	964.0	1004.8	1112.1	1274.5	1408.0	1500.0
Gadolinium ($Z=64$)							
0.00	3.20E+02	3.20E+02	3.20E+02	3.20E+02	3.19E+02	3.19E+02	3.19E+02
0.01	3.19E+02	3.19E+02	3.19E+02	3.19E+02	3.19E+02	3.19E+02	3.18E+02
0.02	3.19E+02	3.19E+02	3.18E+02	3.18E+02	3.17E+02	3.16E+02	3.16E+02
0.04	3.17E+02	3.15E+02	3.14E+02	3.13E+02	3.11E+02	3.09E+02	3.08E+02
0.06	3.13E+02	3.09E+02	3.09E+02	3.06E+02	3.02E+02	2.99E+02	2.96E+02
0.10	3.02E+02	2.95E+02	2.93E+02	2.88E+02	2.81E+02	2.75E+02	2.71E+02
0.20	2.69E+02	2.53E+02	2.50E+02	2.41E+02	2.28E+02	2.17E+02	2.10E+02
0.30	2.37E+02	2.15E+02	2.10E+02	1.98E+02	1.80E+02	1.67E+02	1.58E+02
0.40	2.06E+02	1.79E+02	1.74E+02	1.60E+02	1.42E+02	1.29E+02	1.21E+02
0.50	1.78E+02	1.50E+02	1.44E+02	1.30E+02	1.12E+02	1.00E+02	9.32E+01
0.60	1.54E+02	1.25E+02	1.20E+02	1.06E+02	9.00E+01	7.91E+01	7.29E+01
0.70	1.33E+02	1.05E+02	1.00E+02	8.79E+01	7.27E+01	6.27E+01	5.69E+01
0.80	1.16E+02	8.93E+01	8.44E+01	7.31E+01	5.92E+01	5.02E+01	4.50E+01
1.00	8.83E+01	6.49E+01	6.08E+01	5.14E+01	4.04E+01	3.36E+01	2.97E+01
1.20	6.81E+01	4.81E+01	4.47E+01	3.73E+01	2.92E+01	2.46E+01	2.22E+01
1.50	4.73E+01	3.22E+01	2.98E+01	2.48E+01	1.99E+01	1.74E+01	1.65E+01
1.70	3.80E+01	2.58E+01	2.39E+01	2.00E+01	1.61E+01	1.42E+01	1.34E+01
2.00	2.86E+01	1.97E+01	1.83E+01	1.54E+01	1.21E+01	1.01E+01	8.92E+00
2.50	1.96E+01	1.38E+01	1.28E+01	1.05E+01	7.45E+00	5.16E+00	3.77E+00
3.00	1.43E+01	9.59E+00	8.79E+00	6.90E+00	4.49E+00	2.86E+00	1.95E+00
3.50	1.06E+01	6.40E+00	5.75E+00	4.34E+00	2.83E+00	1.96E+00	1.50E+00
4.00	7.71E+00	4.23E+00	3.75E+00	2.78E+00	1.94E+00	1.59E+00	1.49E+00
5.00	4.17E+00	2.17E+00	1.92E+00	1.46E+00	1.15E+00	1.14E+00	1.28E+00
6.00	2.50E+00	1.45E+00	1.31E+00	1.04E+00	7.77E−01	6.39E−01	5.65E−01
7.00	1.71E+00	1.10E+00	1.01E+00	8.07E−01	5.23E−01	3.14E−01	1.95E−01
8.00	1.27E+00	8.33E−01	7.62E−01	5.88E−01	3.39E−01	1.70E−01	8.84E−02
9.00	9.75E−01	5.93E−01	5.32E−01	3.92E−01	2.18E−01	1.11E−01	6.13E−02
10.00	7.50E−01	4.05E−01	3.55E−01	2.51E−01	1.44E−01	8.68E−02	5.86E−02
12.50	3.76E−01	1.65E−01	1.40E−01	9.68E−02	6.75E−02	6.37E−02	7.15E−02
15.00	1.95E−01	8.90E−02	7.71E−02	5.63E−02	4.33E−02	4.39E−02	5.10E−02
17.50	1.15E−01	6.14E−02	5.50E−02	4.26E−02	3.11E−02	2.48E−02	2.12E−02
20.00	7.71E−02	4.71E−02	4.31E−02	3.41E−02	2.22E−02	1.31E−02	7.92E−03
22.50	5.66E−02	3.64E−02	3.34E−02	2.60E−02	1.49E−02	7.10E−03	3.44E−03
25.00	4.37E−02	2.73E−02	2.47E−02	1.83E−02	9.50E−03	4.08E−03	1.82E−03
27.50	3.43E−02	1.98E−02	1.75E−02	1.22E−02	5.84E−03	2.46E−03	1.12E−03
30.00	2.70E−02	1.40E−02	1.20E−02	7.83E−03	3.55E−03	1.52E−03	7.36E−04
35.00	1.63E−02	6.75E−03	5.52E−03	3.19E−03	1.31E−03	5.83E−04	3.19E−04
40.00	9.46E−03	3.27E−03	2.57E−03	1.36E−03	5.15E−04	2.35E−04	1.38E−04
45.00	5.43E−03	1.64E−03	1.25E−03	6.25E−04	2.27E−04	1.05E−04	6.52E−05
50.00	3.14E−03	8.59E−04	6.47E−04	3.13E−04	1.13E−04	5.40E−05	3.49E−05
55.00	1.86E−03	4.81E−04	3.61E−04	1.75E−04	6.65E−05	3.49E−05	2.48E−05
60.00	1.16E−03	2.93E−04	2.21E−04	1.11E−04	4.66E−05	2.79E−05	2.23E−05
65.00	7.60E−04	1.95E−04	1.49E−04	7.80E−05	3.65E−05	2.48E−05	2.20E−05
70.00	5.34E−04	1.42E−04	1.10E−04	6.08E−05	3.15E−05	2.36E−05	2.26E−05
75.00	4.01E−04	1.13E−04	8.90E−05	5.16E−05	2.89E−05	2.31E−05	2.29E−05
80.00	3.20E−04	9.57E−05	7.66E−05	4.64E−05	2.76E−05	2.28E−05	2.28E−05
85.00	2.69E−04	8.51E−05	6.91E−05	4.35E−05	2.71E−05	2.28E−05	2.28E−05
90.00	2.36E−04	7.86E−05	6.47E−05	4.20E−05	2.72E−05	2.31E−05	2.29E−05
95.00	2.13E−04	7.42E−05	6.17E−05	4.11E−05	2.74E−05	2.35E−05	2.30E−05
105.00	1.85E−04	6.95E−05	5.88E−05	4.09E−05	2.86E−05	2.47E−05	2.40E−05
120.00	1.65E−04	6.68E−05	5.76E−05	4.19E−05	3.08E−05	2.71E−05	2.60E−05
135.00	1.56E−04	6.73E−05	5.88E−05	4.43E−05	3.36E−05	2.95E−05	2.76E−05
150.00	1.51E−04	6.83E−05	6.02E−05	4.64E−05	3.60E−05	3.14E−05	2.90E−05
165.00	1.50E−04	6.93E−05	6.15E−05	4.80E−05	3.77E−05	3.29E−05	3.00E−05
180.00	1.49E−04	6.97E−05	6.20E−05	4.86E−05	3.84E−05	3.35E−05	3.05E−05
total	7.13E−01	4.67E−01	4.30E−01	3.52E−01	2.66E−01	2.16E−01	1.93E−01
rel ff	7.46E−01	4.90E−01	4.52E−01	3.69E−01	2.81E−01	2.31E−01	2.04E−01
nrl ff	8.06E−01	5.30E−01	4.89E−01	3.99E−01	3.04E−01	2.50E−01	2.21E−01

TABLE 1. Predicted *S*-matrix differential elastic scattering cross sections for photon energies (50.0, 59.54, 145.4, 316.5, 411.8, 468.1, 661.6, 778.9, 964.0, 1004.8, 1112.1, 1274.5, 1408.0 and 1500.0). The angle integrated total cross sections for each element and energies are presented. ''total'' represents total cross sections from this work, ''rel ff'' represents total cross sections calculated from the relativistic form factor and ''nrl ff'' represents total cross sections calculated from the nonrelativistic form factor—Continued[a]

θ (deg)	Photon energy (keV)						
	50.0	59.5	145.4	316.5	411.8	468.1	661.6
Terbium ($Z=65$)							
0.00	3.20E+02	3.22E+02	3.33E+02	3.31E+02	3.30E+02	3.30E+02	3.30E+02
0.01	3.20E+02	3.22E+02	3.33E+02	3.31E+02	3.30E+02	3.30E+02	3.30E+02
0.02	3.20E+02	3.22E+02	3.33E+02	3.31E+02	3.30E+02	3.30E+02	3.29E+02
0.04	3.20E+02	3.22E+02	3.33E+02	3.30E+02	3.30E+02	3.29E+02	3.28E+02
0.06	3.20E+02	3.22E+02	3.33E+02	3.30E+02	3.28E+02	3.28E+02	3.25E+02
0.10	3.20E+02	3.22E+02	3.32E+02	3.27E+02	3.25E+02	3.23E+02	3.17E+02
0.20	3.20E+02	3.22E+02	3.30E+02	3.19E+02	3.11E+02	3.06E+02	2.89E+02
0.30	3.19E+02	3.21E+02	3.27E+02	3.06E+02	2.94E+02	2.86E+02	2.60E+02
0.40	3.19E+02	3.20E+02	3.22E+02	2.93E+02	2.75E+02	2.66E+02	2.33E+02
0.50	3.18E+02	3.19E+02	3.17E+02	2.79E+02	2.58E+02	2.46E+02	2.07E+02
0.60	3.17E+02	3.18E+02	3.11E+02	2.65E+02	2.41E+02	2.27E+02	1.84E+02
0.70	3.16E+02	3.17E+02	3.06E+02	2.51E+02	2.24E+02	2.09E+02	1.62E+02
0.80	3.15E+02	3.15E+02	2.99E+02	2.38E+02	2.08E+02	1.92E+02	1.44E+02
1.00	3.13E+02	3.11E+02	2.86E+02	2.13E+02	1.79E+02	1.61E+02	1.13E+02
1.20	3.10E+02	3.07E+02	2.73E+02	1.90E+02	1.54E+02	1.36E+02	9.02E+01
1.50	3.04E+02	3.00E+02	2.54E+02	1.60E+02	1.23E+02	1.06E+02	6.49E+01
1.70	3.00E+02	2.95E+02	2.42E+02	1.42E+02	1.06E+02	8.99E+01	5.27E+01
2.00	2.94E+02	2.88E+02	2.25E+02	1.20E+02	8.59E+01	7.12E+01	3.95E+01
2.50	2.83E+02	2.74E+02	1.97E+02	9.08E+01	6.14E+01	4.95E+01	2.65E+01
3.00	2.73E+02	2.62E+02	1.72E+02	6.98E+01	4.48E+01	3.59E+01	1.95E+01
3.50	2.62E+02	2.49E+02	1.51E+02	5.44E+01	3.39E+01	2.72E+01	1.52E+01
4.00	2.52E+02	2.36E+02	1.32E+02	4.33E+01	2.68E+01	2.14E+01	1.19E+01
5.00	2.30E+02	2.13E+02	1.02E+02	2.90E+01	1.85E+01	1.45E+01	7.01E+00
6.00	2.11E+02	1.90E+02	7.98E+01	2.11E+01	1.36E+01	1.03E+01	4.11E+00
7.00	1.92E+02	1.70E+02	6.30E+01	1.61E+01	9.97E+00	7.26E+00	2.63E+00
8.00	1.76E+02	1.52E+02	5.02E+01	1.26E+01	7.13E+00	5.09E+00	1.88E+00
9.00	1.60E+02	1.35E+02	4.07E+01	9.93E+00	5.08E+00	3.62E+00	1.47E+00
10.00	1.45E+02	1.21E+02	3.36E+01	7.82E+00	3.70E+00	2.66E+00	1.19E+00
12.50	1.12E+02	9.19E+01	2.28E+01	4.33E+00	2.01E+00	1.47E+00	6.91E−01
15.00	8.46E+01	7.05E+01	1.69E+01	2.57E+00	1.37E+00	9.79E−01	3.74E−01
17.50	6.48E+01	5.45E+01	1.29E+01	1.70E+00	9.88E−01	6.85E−01	2.08E−01
20.00	5.09E+01	4.26E+01	9.69E+00	1.23E+00	6.95E−01	4.66E−01	1.29E−01
22.50	4.11E+01	3.38E+01	7.18E+00	9.34E−01	4.73E−01	3.11E−01	8.93E−02
25.00	3.40E+01	2.73E+01	5.30E+00	7.20E−01	3.21E−01	2.10E−01	6.75E−02
27.50	2.88E+01	2.25E+01	3.96E+00	5.53E−01	2.22E−01	1.46E−01	5.36E−02
30.00	2.46E+01	1.89E+01	3.04E+00	4.22E−01	1.59E−01	1.06E−01	4.36E−02
35.00	1.84E+01	1.39E+01	1.96E+00	2.45E−01	9.32E−02	6.38E−02	2.90E−02
40.00	1.39E+01	1.05E+01	1.41E+00	1.48E−01	6.29E−02	4.38E−02	1.88E−02
45.00	1.04E+01	8.03E+00	1.08E+00	9.57E−02	4.62E−02	3.23E−02	1.19E−02
50.00	7.76E+00	6.06E+00	8.37E−01	6.64E−02	3.52E−02	2.43E−02	7.52E−03
55.00	5.75E+00	4.54E+00	6.44E−01	4.90E−02	2.71E−02	1.83E−02	4.80E−03
60.00	4.28E+00	3.39E+00	4.92E−01	3.81E−02	2.10E−02	1.38E−02	3.14E−03
65.00	3.23E+00	2.55E+00	3.76E−01	3.09E−02	1.64E−02	1.05E−02	2.13E−03
70.00	2.49E+00	1.96E+00	2.91E−01	2.58E−02	1.30E−02	8.07E−03	1.51E−03
75.00	1.97E+00	1.54E+00	2.30E−01	2.21E−02	1.05E−02	6.35E−03	1.13E−03
80.00	1.60E+00	1.24E+00	1.87E−01	1.93E−02	8.67E−03	5.15E−03	8.87E−04
85.00	1.35E+00	1.04E+00	1.57E−01	1.73E−02	7.36E−03	4.30E−03	7.29E−04
90.00	1.17E+00	9.00E−01	1.36E−01	1.58E−02	6.42E−03	3.70E−03	6.26E−04
95.00	1.05E+00	8.04E−01	1.22E−01	1.47E−02	5.74E−03	3.27E−03	5.55E−04
105.00	9.14E−01	6.98E−01	1.07E−01	1.33E−02	4.86E−03	2.73E−03	4.68E−04
120.00	8.61E−01	6.58E−01	1.02E−01	1.23E−02	4.18E−03	2.31E−03	4.02E−04
135.00	8.81E−01	6.74E−01	1.05E−01	1.19E−02	3.83E−03	2.09E−03	3.68E−04
150.00	9.17E−01	7.04E−01	1.09E−01	1.17E−02	3.63E−03	1.97E−03	3.50E−04
165.00	9.46E−01	7.28E−01	1.13E−01	1.16E−02	3.53E−03	1.90E−03	3.41E−04
180.00	9.56E−01	7.36E−01	1.15E−01	1.15E−02	3.50E−03	1.88E−03	3.38E−04
total	9.66E+01	7.89E+01	1.95E+01	4.41E+00	2.64E+00	2.04E+00	1.03E+00
rel ff	1.16E+02	8.83E+01	1.88E+01	4.44E+00	2.69E+00	2.10E+00	1.07E+00
nrl ff	1.21E+02	9.22E+01	2.00E+01	4.78E+00	2.91E+00	2.27E+00	1.16E+00

TABLE 1. Predicted *S*-matrix differential elastic scattering cross sections for photon energies (50.0, 59.54, 145.4, 316.5, 411.8, 468.1, 661.6, 778.9, 964.0, 1004.8, 1112.1, 1274.5, 1408.0 and 1500.0). The angle integrated total cross sections for each element and energies are presented. ''total'' represents total cross sections from this work, ''rel ff'' represents total cross sections calculated from the relativistic form factor and ''nrl ff'' represents total cross sections calculated from the nonrelativistic form factor—Continued[a]

θ (deg)	Photon energy (keV)						
	778.9	964.0	1004.8	1112.1	1274.5	1408.0	1500.0
Terbium ($Z=65$)							
0.00	3.30E+02	3.30E+02	3.30E+02	3.30E+02	3.29E+02	3.29E+02	3.29E+02
0.01	3.29E+02	3.29E+02	3.29E+02	3.29E+02	3.29E+02	3.28E+02	3.28E+02
0.02	3.29E+02	3.29E+02	3.28E+02	3.28E+02	3.27E+02	3.26E+02	3.26E+02
0.04	3.27E+02	3.25E+02	3.24E+02	3.23E+02	3.21E+02	3.19E+02	3.18E+02
0.06	3.23E+02	3.19E+02	3.19E+02	3.16E+02	3.12E+02	3.09E+02	3.06E+02
0.10	3.12E+02	3.04E+02	3.03E+02	2.98E+02	2.91E+02	2.85E+02	2.81E+02
0.20	2.79E+02	2.62E+02	2.59E+02	2.50E+02	2.36E+02	2.26E+02	2.19E+02
0.30	2.46E+02	2.23E+02	2.18E+02	2.06E+02	1.88E+02	1.74E+02	1.65E+02
0.40	2.14E+02	1.87E+02	1.81E+02	1.67E+02	1.48E+02	1.35E+02	1.26E+02
0.50	1.86E+02	1.56E+02	1.51E+02	1.36E+02	1.18E+02	1.05E+02	9.72E+01
0.60	1.61E+02	1.31E+02	1.25E+02	1.11E+02	9.41E+01	8.26E+01	7.60E+01
0.70	1.40E+02	1.10E+02	1.05E+02	9.19E+01	7.59E+01	6.54E+01	5.94E+01
0.80	1.21E+02	9.34E+01	8.83E+01	7.63E+01	6.18E+01	5.23E+01	4.69E+01
1.00	9.23E+01	6.78E+01	6.34E+01	5.36E+01	4.21E+01	3.49E+01	3.09E+01
1.20	7.11E+01	5.01E+01	4.66E+01	3.88E+01	3.02E+01	2.53E+01	2.27E+01
1.50	4.93E+01	3.34E+01	3.09E+01	2.57E+01	2.04E+01	1.79E+01	1.68E+01
1.70	3.95E+01	2.66E+01	2.47E+01	2.06E+01	1.66E+01	1.47E+01	1.39E+01
2.00	2.95E+01	2.02E+01	1.88E+01	1.58E+01	1.25E+01	1.06E+01	9.52E+00
2.50	2.01E+01	1.42E+01	1.32E+01	1.09E+01	7.81E+00	5.51E+00	4.08E+00
3.00	1.47E+01	1.00E+01	9.20E+00	7.28E+00	4.76E+00	3.01E+00	2.03E+00
3.50	1.10E+01	6.78E+00	6.11E+00	4.63E+00	2.99E+00	2.01E+00	1.49E+00
4.00	8.08E+00	4.51E+00	3.99E+00	2.97E+00	2.03E+00	1.61E+00	1.45E+00
5.00	4.40E+00	2.27E+00	2.00E+00	1.52E+00	1.18E+00	1.18E+00	1.34E+00
6.00	2.63E+00	1.49E+00	1.34E+00	1.05E+00	8.03E−01	6.92E−01	6.46E−01
7.00	1.78E+00	1.13E+00	1.04E+00	8.28E−01	5.49E−01	3.43E−01	2.23E−01
8.00	1.31E+00	8.68E−01	7.96E−01	6.19E−01	3.61E−01	1.82E−01	9.51E−02
9.00	1.01E+00	6.28E−01	5.66E−01	4.21E−01	2.33E−01	1.16E−01	6.16E−02
10.00	7.84E−01	4.34E−01	3.82E−01	2.72E−01	1.54E−01	8.84E−02	5.65E−02
12.50	4.00E−01	1.76E−01	1.50E−01	1.03E−01	7.03E−02	6.43E−02	7.00E−02
15.00	2.08E−01	9.27E−02	7.99E−02	5.78E−02	4.43E−02	4.57E−02	5.45E−02
17.50	1.21E−01	6.28E−02	5.60E−02	4.30E−02	3.19E−02	2.65E−02	2.39E−02
20.00	8.02E−02	4.81E−02	4.39E−02	3.47E−02	2.29E−02	1.41E−02	8.94E−03
22.50	5.84E−02	3.75E−02	3.44E−02	2.69E−02	1.57E−02	7.64E−03	3.78E−03
25.00	4.50E−02	2.84E−02	2.58E−02	1.93E−02	1.01E−02	4.38E−03	1.95E−03
27.50	3.54E−02	2.08E−02	1.84E−02	1.30E−02	6.32E−03	2.64E−03	1.18E−03
30.00	2.80E−02	1.48E−02	1.28E−02	8.46E−03	3.87E−03	1.64E−03	7.79E−04
35.00	1.71E−02	7.25E−03	5.96E−03	3.49E−03	1.44E−03	6.38E−04	3.43E−04
40.00	1.00E−02	3.55E−03	2.80E−03	1.50E−03	5.72E−04	2.60E−04	1.52E−04
45.00	5.83E−03	1.79E−03	1.38E−03	6.92E−04	2.53E−04	1.17E−04	7.24E−05
50.00	3.40E−03	9.44E−04	7.14E−04	3.47E−04	1.26E−04	6.02E−05	3.89E−05
55.00	2.03E−03	5.31E−04	3.99E−04	1.95E−04	7.40E−05	3.88E−05	2.74E−05
60.00	1.27E−03	3.25E−04	2.45E−04	1.23E−04	5.16E−05	3.08E−05	2.45E−05
65.00	8.36E−04	2.16E−04	1.65E−04	8.65E−05	4.03E−05	2.72E−05	2.40E−05
70.00	5.89E−04	1.58E−04	1.22E−04	6.74E−05	3.46E−05	2.58E−05	2.45E−05
75.00	4.43E−04	1.25E−04	9.86E−05	5.70E−05	3.17E−05	2.51E−05	2.48E−05
80.00	3.55E−04	1.06E−04	8.48E−05	5.11E−05	3.02E−05	2.48E−05	2.47E−05
85.00	2.98E−04	9.41E−05	7.64E−05	4.78E−05	2.96E−05	2.47E−05	2.45E−05
90.00	2.61E−04	8.68E−05	7.14E−05	4.61E−05	2.95E−05	2.49E−05	2.46E−05
95.00	2.36E−04	8.19E−05	6.80E−05	4.50E−05	2.97E−05	2.52E−05	2.47E−05
105.00	2.05E−04	7.64E−05	6.45E−05	4.45E−05	3.08E−05	2.65E−05	2.56E−05
120.00	1.82E−04	7.31E−05	6.28E−05	4.54E−05	3.30E−05	2.89E−05	2.76E−05
135.00	1.72E−04	7.33E−05	6.39E−05	4.77E−05	3.58E−05	3.12E−05	2.93E−05
150.00	1.67E−04	7.41E−05	6.52E−05	4.97E−05	3.82E−05	3.32E−05	3.06E−05
165.00	1.64E−04	7.51E−05	6.64E−05	5.14E−05	3.99E−05	3.47E−05	3.17E−05
180.00	1.64E−04	7.55E−05	6.69E−05	5.20E−05	4.06E−05	3.53E−05	3.22E−05
total	7.43E−01	4.87E−01	4.49E−01	3.67E−01	2.77E−01	2.26E−01	2.01E−01
rel ff	7.79E−01	5.12E−01	4.72E−01	3.85E−01	2.94E−01	2.42E−01	2.13E−01
nrl ff	8.44E−01	5.55E−01	5.11E−01	4.18E−01	3.18E−01	2.62E−01	2.32E−01

TABLE 1. Predicted *S*-matrix differential elastic scattering cross sections for photon energies (50.0, 59.54, 145.4, 316.5, 411.8, 468.1, 661.6, 778.9, 964.0, 1004.8, 1112.1, 1274.5, 1408.0 and 1500.0). The angle integrated total cross sections for each element and energies are presented. ''total'' represents total cross sections from this work, ''rel ff'' represents total cross sections calculated from the relativistic form factor and ''nrl ff'' represents total cross sections calculated from the nonrelativistic form factor—Continued[a]

θ (deg)	Photon energy (keV)						
	50.0	59.5	145.4	316.5	411.8	468.1	661.6
Dysprosium ($Z=66$)							
0.00	3.28E+02	3.31E+02	3.43E+02	3.41E+02	3.41E+02	3.40E+02	3.40E+02
0.01	3.28E+02	3.31E+02	3.43E+02	3.41E+02	3.40E+02	3.40E+02	3.40E+02
0.02	3.28E+02	3.31E+02	3.43E+02	3.41E+02	3.40E+02	3.40E+02	3.39E+02
0.04	3.28E+02	3.31E+02	3.43E+02	3.40E+02	3.40E+02	3.39E+02	3.38E+02
0.06	3.28E+02	3.31E+02	3.43E+02	3.40E+02	3.39E+02	3.38E+02	3.35E+02
0.10	3.28E+02	3.31E+02	3.42E+02	3.38E+02	3.35E+02	3.33E+02	3.27E+02
0.20	3.28E+02	3.30E+02	3.40E+02	3.29E+02	3.21E+02	3.16E+02	2.99E+02
0.30	3.28E+02	3.30E+02	3.37E+02	3.16E+02	3.03E+02	2.96E+02	2.70E+02
0.40	3.27E+02	3.29E+02	3.32E+02	3.03E+02	2.85E+02	2.75E+02	2.42E+02
0.50	3.26E+02	3.28E+02	3.28E+02	2.88E+02	2.67E+02	2.55E+02	2.15E+02
0.60	3.26E+02	3.27E+02	3.22E+02	2.74E+02	2.49E+02	2.35E+02	1.91E+02
0.70	3.25E+02	3.25E+02	3.16E+02	2.60E+02	2.32E+02	2.17E+02	1.69E+02
0.80	3.24E+02	3.24E+02	3.09E+02	2.47E+02	2.16E+02	1.99E+02	1.50E+02
1.00	3.21E+02	3.20E+02	2.96E+02	2.21E+02	1.86E+02	1.68E+02	1.18E+02
1.20	3.18E+02	3.16E+02	2.83E+02	1.98E+02	1.60E+02	1.42E+02	9.41E+01
1.50	3.13E+02	3.09E+02	2.64E+02	1.66E+02	1.28E+02	1.10E+02	6.77E+01
1.70	3.09E+02	3.04E+02	2.51E+02	1.48E+02	1.11E+02	9.39E+01	5.50E+01
2.00	3.02E+02	2.96E+02	2.33E+02	1.25E+02	8.97E+01	7.43E+01	4.11E+01
2.50	2.91E+02	2.83E+02	2.05E+02	9.48E+01	6.40E+01	5.16E+01	2.73E+01
3.00	2.81E+02	2.70E+02	1.79E+02	7.28E+01	4.67E+01	3.73E+01	2.01E+01
3.50	2.70E+02	2.57E+02	1.57E+02	5.67E+01	3.52E+01	2.81E+01	1.56E+01
4.00	2.59E+02	2.44E+02	1.38E+02	4.50E+01	2.77E+01	2.21E+01	1.23E+01
5.00	2.38E+02	2.20E+02	1.07E+02	3.01E+01	1.90E+01	1.50E+01	7.39E+00
6.00	2.17E+02	1.97E+02	8.33E+01	2.17E+01	1.41E+01	1.07E+01	4.34E+00
7.00	1.99E+02	1.76E+02	6.57E+01	1.66E+01	1.04E+01	7.60E+00	2.75E+00
8.00	1.82E+02	1.57E+02	5.24E+01	1.30E+01	7.50E+00	5.37E+00	1.95E+00
9.00	1.66E+02	1.40E+02	4.23E+01	1.03E+01	5.37E+00	3.82E+00	1.51E+00
10.00	1.51E+02	1.25E+02	3.49E+01	8.17E+00	3.91E+00	2.80E+00	1.23E+00
12.50	1.16E+02	9.53E+01	2.34E+01	4.56E+00	2.09E+00	1.52E+00	7.27E−01
15.00	8.80E+01	7.30E+01	1.73E+01	2.71E+00	1.41E+00	1.01E+00	3.98E−01
17.50	6.71E+01	5.64E+01	1.33E+01	1.77E+00	1.03E+00	7.14E−01	2.21E−01
20.00	5.23E+01	4.39E+01	1.01E+01	1.28E+00	7.30E−01	4.92E−01	1.36E−01
22.50	4.20E+01	3.47E+01	7.56E+00	9.69E−01	5.02E−01	3.30E−01	9.29E−02
25.00	3.46E+01	2.79E+01	5.60E+00	7.51E−01	3.42E−01	2.23E−01	6.97E−02
27.50	2.91E+01	2.29E+01	4.19E+00	5.80E−01	2.36E−01	1.55E−01	5.52E−02
30.00	2.48E+01	1.92E+01	3.20E+00	4.45E−01	1.69E−01	1.12E−01	4.49E−02
35.00	1.86E+01	1.40E+01	2.05E+00	2.60E−01	9.75E−02	6.64E−02	3.00E−02
40.00	1.40E+01	1.06E+01	1.46E+00	1.57E−01	6.51E−02	4.52E−02	1.96E−02
45.00	1.06E+01	8.14E+00	1.12E+00	1.01E−01	4.76E−02	3.32E−02	1.26E−02
50.00	7.89E+00	6.18E+00	8.69E−01	6.95E−02	3.63E−02	2.51E−02	8.01E−03
55.00	5.86E+00	4.64E+00	6.74E−01	5.10E−02	2.80E−02	1.91E−02	5.15E−03
60.00	4.36E+00	3.47E+00	5.19E−01	3.95E−02	2.18E−02	1.45E−02	3.39E−03
65.00	3.28E+00	2.61E+00	3.99E−01	3.19E−02	1.72E−02	1.10E−02	2.31E−03
70.00	2.51E+00	1.99E+00	3.10E−01	2.67E−02	1.37E−02	8.56E−03	1.64E−03
75.00	1.97E+00	1.56E+00	2.45E−01	2.29E−02	1.11E−02	6.78E−03	1.23E−03
80.00	1.59E+00	1.25E+00	1.99E−01	2.01E−02	9.21E−03	5.52E−03	9.73E−04
85.00	1.33E+00	1.04E+00	1.67E−01	1.81E−02	7.85E−03	4.63E−03	8.02E−04
90.00	1.14E+00	8.91E−01	1.45E−01	1.66E−02	6.87E−03	4.00E−03	6.90E−04
95.00	1.01E+00	7.90E−01	1.30E−01	1.55E−02	6.16E−03	3.55E−03	6.12E−04
105.00	8.73E−01	6.79E−01	1.13E−01	1.41E−02	5.24E−03	2.97E−03	5.17E−04
120.00	8.12E−01	6.32E−01	1.07E−01	1.31E−02	4.54E−03	2.52E−03	4.44E−04
135.00	8.26E−01	6.43E−01	1.10E−01	1.27E−02	4.17E−03	2.29E−03	4.07E−04
150.00	8.58E−01	6.70E−01	1.14E−01	1.25E−02	3.97E−03	2.16E−03	3.87E−04
165.00	8.83E−01	6.91E−01	1.18E−01	1.24E−02	3.86E−03	2.09E−03	3.77E−04
180.00	8.92E−01	6.99E−01	1.20E−01	1.24E−02	3.82E−03	2.07E−03	3.73E−04
total	9.85E+01	8.07E+01	2.03E+01	4.60E+00	2.75E+00	2.13E+00	1.08E+00
rel ff	1.21E+02	9.20E+01	1.95E+01	4.63E+00	2.81E+00	2.20E+00	1.12E+00
nrl ff	1.26E+02	9.59E+01	2.08E+01	4.99E+00	3.04E+00	2.37E+00	1.21E+00

TABLE 1. Predicted *S*-matrix differential elastic scattering cross sections for photon energies (50.0, 59.54, 145.4, 316.5, 411.8, 468.1, 661.6, 778.9, 964.0, 1004.8, 1112.1, 1274.5, 1408.0 and 1500.0). The angle integrated total cross sections for each element and energies are presented. ''total'' represents total cross sections from this work, ''rel ff'' represents total cross sections calculated from the relativistic form factor and ''nrl ff'' represents total cross sections calculated from the nonrelativistic form factor—Continued[a]

θ (deg)	Photon energy (keV)						
	778.9	964.0	1004.8	1112.1	1274.5	1408.0	1500.0
Dysprosium ($Z=66$)							
0.00	3.40E+02	3.40E+02	3.40E+02	3.40E+02	3.39E+02	3.39E+02	3.39E+02
0.01	3.40E+02	3.39E+02	3.39E+02	3.39E+02	3.39E+02	3.39E+02	3.38E+02
0.02	3.39E+02	3.39E+02	3.39E+02	3.38E+02	3.37E+02	3.36E+02	3.36E+02
0.04	3.37E+02	3.35E+02	3.34E+02	3.33E+02	3.31E+02	3.29E+02	3.28E+02
0.06	3.33E+02	3.29E+02	3.29E+02	3.26E+02	3.22E+02	3.19E+02	3.16E+02
0.10	3.22E+02	3.14E+02	3.13E+02	3.08E+02	3.00E+02	2.94E+02	2.90E+02
0.20	2.88E+02	2.72E+02	2.68E+02	2.59E+02	2.45E+02	2.34E+02	2.27E+02
0.30	2.54E+02	2.31E+02	2.26E+02	2.14E+02	1.96E+02	1.82E+02	1.72E+02
0.40	2.23E+02	1.95E+02	1.89E+02	1.75E+02	1.55E+02	1.40E+02	1.31E+02
0.50	1.93E+02	1.63E+02	1.57E+02	1.42E+02	1.23E+02	1.09E+02	1.01E+02
0.60	1.68E+02	1.37E+02	1.31E+02	1.16E+02	9.82E+01	8.62E+01	7.93E+01
0.70	1.46E+02	1.15E+02	1.09E+02	9.60E+01	7.92E+01	6.83E+01	6.20E+01
0.80	1.27E+02	9.75E+01	9.21E+01	7.96E+01	6.44E+01	5.46E+01	4.90E+01
1.00	9.64E+01	7.07E+01	6.62E+01	5.58E+01	4.37E+01	3.62E+01	3.21E+01
1.20	7.43E+01	5.22E+01	4.85E+01	4.03E+01	3.13E+01	2.61E+01	2.33E+01
1.50	5.14E+01	3.47E+01	3.20E+01	2.65E+01	2.10E+01	1.83E+01	1.72E+01
1.70	4.11E+01	2.75E+01	2.55E+01	2.12E+01	1.70E+01	1.51E+01	1.44E+01
2.00	3.06E+01	2.08E+01	1.93E+01	1.62E+01	1.29E+01	1.11E+01	1.01E+01
2.50	2.07E+01	1.46E+01	1.36E+01	1.12E+01	8.18E+00	5.87E+00	4.42E+00
3.00	1.52E+01	1.04E+01	9.62E+00	7.66E+00	5.03E+00	3.17E+00	2.13E+00
3.50	1.14E+01	7.15E+00	6.47E+00	4.93E+00	3.16E+00	2.07E+00	1.49E+00
4.00	8.46E+00	4.79E+00	4.25E+00	3.16E+00	2.13E+00	1.63E+00	1.41E+00
5.00	4.64E+00	2.38E+00	2.10E+00	1.58E+00	1.22E+00	1.22E+00	1.39E+00
6.00	2.75E+00	1.53E+00	1.37E+00	1.08E+00	8.30E−01	7.44E−01	7.30E−01
7.00	1.85E+00	1.16E+00	1.07E+00	8.49E−01	5.74E−01	3.74E−01	2.54E−01
8.00	1.36E+00	9.03E−01	8.30E−01	6.49E−01	3.83E−01	1.95E−01	1.03E−01
9.00	1.05E+00	6.64E−01	6.01E−01	4.50E−01	2.49E−01	1.21E−01	6.27E−02
10.00	8.18E−01	4.63E−01	4.09E−01	2.93E−01	1.64E−01	9.05E−02	5.51E−02
12.50	4.23E−01	1.88E−01	1.60E−01	1.09E−01	7.33E−02	6.49E−02	6.84E−02
15.00	2.20E−01	9.68E−02	8.31E−02	5.95E−02	4.54E−02	4.74E−02	5.76E−02
17.50	1.27E−01	6.44E−02	5.71E−02	4.36E−02	3.26E−02	2.82E−02	2.67E−02
20.00	8.35E−02	4.92E−02	4.47E−02	3.53E−02	2.37E−02	1.52E−02	1.00E−02
22.50	6.04E−02	3.86E−02	3.54E−02	2.78E−02	1.65E−02	8.22E−03	4.16E−03
25.00	4.64E−02	2.95E−02	2.69E−02	2.03E−02	1.08E−02	4.70E−03	2.10E−03
27.50	3.65E−02	2.18E−02	1.94E−02	1.39E−02	6.81E−03	2.83E−03	1.26E−03
30.00	2.90E−02	1.56E−02	1.36E−02	9.11E−03	4.21E−03	1.77E−03	8.25E−04
35.00	1.79E−02	7.77E−03	6.42E−03	3.81E−03	1.59E−03	6.96E−04	3.69E−04
40.00	1.06E−02	3.84E−03	3.05E−03	1.64E−03	6.34E−04	2.87E−04	1.66E−04
45.00	6.23E−03	1.95E−03	1.51E−03	7.64E−04	2.81E−04	1.31E−04	8.02E−05
50.00	3.66E−03	1.04E−03	7.85E−04	3.85E−04	1.40E−04	6.71E−05	4.32E−05
55.00	2.20E−03	5.85E−04	4.41E−04	2.16E−04	8.23E−05	4.30E−05	3.03E−05
60.00	1.38E−03	3.59E−04	2.71E−04	1.37E−04	5.71E−05	3.39E−05	2.69E−05
65.00	9.17E−04	2.39E−04	1.83E−04	9.59E−05	4.44E−05	2.98E−05	2.61E−05
70.00	6.48E−04	1.75E−04	1.36E−04	7.46E−05	3.81E−05	2.81E−05	2.66E−05
75.00	4.89E−04	1.39E−04	1.09E−04	6.29E−05	3.48E−05	2.74E−05	2.68E−05
80.00	3.92E−04	1.17E−04	9.37E−05	5.63E−05	3.30E−05	2.69E−05	2.66E−05
85.00	3.29E−04	1.04E−04	8.43E−05	5.26E−05	3.22E−05	2.67E−05	2.64E−05
90.00	2.89E−04	9.59E−05	7.87E−05	5.05E−05	3.21E−05	2.69E−05	2.64E−05
95.00	2.61E−04	9.03E−05	7.48E−05	4.93E−05	3.22E−05	2.72E−05	2.64E−05
105.00	2.27E−04	8.40E−05	7.07E−05	4.85E−05	3.32E−05	2.84E−05	2.73E−05
120.00	2.01E−04	8.00E−05	6.86E−05	4.91E−05	3.54E−05	3.07E−05	2.94E−05
135.00	1.89E−04	7.99E−05	6.94E−05	5.13E−05	3.82E−05	3.31E−05	3.10E−05
150.00	1.83E−04	8.05E−05	7.06E−05	5.34E−05	4.05E−05	3.51E−05	3.24E−05
165.00	1.81E−04	8.14E−05	7.17E−05	5.50E−05	4.23E−05	3.66E−05	3.35E−05
180.00	1.80E−04	8.18E−05	7.22E−05	5.56E−05	4.29E−05	3.72E−05	3.40E−05
total	7.74E−01	5.07E−01	4.68E−01	3.82E−01	2.89E−01	2.35E−01	2.10E−01
rel ff	8.14E−01	5.35E−01	4.93E−01	4.03E−01	3.07E−01	2.52E−01	2.23E−01
nrl ff	8.82E−01	5.80E−01	5.35E−01	4.37E−01	3.33E−01	2.74E−01	2.42E−01

TABLE 1. Predicted *S*-matrix differential elastic scattering cross sections for photon energies (50.0, 59.54, 145.4, 316.5, 411.8, 468.1, 661.6, 778.9, 964.0, 1004.8, 1112.1, 1274.5, 1408.0 and 1500.0). The angle integrated total cross sections for each element and energies are presented. ''total'' represents total cross sections from this work, ''rel ff'' represents total cross sections calculated from the relativistic form factor and ''nrl ff'' represents total cross sections calculated from the nonrelativistic form factor—Continued[a]

θ (deg)	Photon energy (keV)						
	50.0	59.5	145.4	316.5	411.8	468.1	661.6
Holmium ($Z=67$)							
0.00	3.37E+02	3.40E+02	3.54E+02	3.51E+02	3.51E+02	3.51E+02	3.50E+02
0.01	3.37E+02	3.40E+02	3.54E+02	3.51E+02	3.51E+02	3.50E+02	3.50E+02
0.02	3.37E+02	3.40E+02	3.53E+02	3.51E+02	3.50E+02	3.50E+02	3.50E+02
0.04	3.37E+02	3.40E+02	3.53E+02	3.51E+02	3.50E+02	3.50E+02	3.48E+02
0.06	3.37E+02	3.40E+02	3.53E+02	3.50E+02	3.49E+02	3.48E+02	3.45E+02
0.10	3.37E+02	3.40E+02	3.53E+02	3.48E+02	3.45E+02	3.44E+02	3.37E+02
0.20	3.37E+02	3.39E+02	3.51E+02	3.39E+02	3.31E+02	3.27E+02	3.09E+02
0.30	3.36E+02	3.39E+02	3.47E+02	3.27E+02	3.13E+02	3.06E+02	2.79E+02
0.40	3.36E+02	3.38E+02	3.43E+02	3.13E+02	2.95E+02	2.84E+02	2.50E+02
0.50	3.35E+02	3.37E+02	3.38E+02	2.98E+02	2.76E+02	2.64E+02	2.23E+02
0.60	3.34E+02	3.36E+02	3.32E+02	2.84E+02	2.58E+02	2.44E+02	1.99E+02
0.70	3.34E+02	3.34E+02	3.26E+02	2.70E+02	2.41E+02	2.25E+02	1.76E+02
0.80	3.33E+02	3.33E+02	3.19E+02	2.56E+02	2.24E+02	2.07E+02	1.56E+02
1.00	3.30E+02	3.29E+02	3.06E+02	2.30E+02	1.94E+02	1.75E+02	1.23E+02
1.20	3.27E+02	3.25E+02	2.92E+02	2.05E+02	1.67E+02	1.48E+02	9.82E+01
1.50	3.22E+02	3.18E+02	2.73E+02	1.73E+02	1.34E+02	1.15E+02	7.06E+01
1.70	3.17E+02	3.13E+02	2.60E+02	1.54E+02	1.16E+02	9.79E+01	5.73E+01
2.00	3.11E+02	3.05E+02	2.42E+02	1.30E+02	9.35E+01	7.74E+01	4.27E+01
2.50	3.00E+02	2.91E+02	2.13E+02	9.89E+01	6.67E+01	5.37E+01	2.83E+01
3.00	2.89E+02	2.78E+02	1.87E+02	7.59E+01	4.86E+01	3.87E+01	2.07E+01
3.50	2.78E+02	2.65E+02	1.64E+02	5.91E+01	3.66E+01	2.91E+01	1.61E+01
4.00	2.67E+02	2.52E+02	1.44E+02	4.68E+01	2.86E+01	2.28E+01	1.28E+01
5.00	2.45E+02	2.27E+02	1.11E+02	3.11E+01	1.96E+01	1.54E+01	7.76E+00
6.00	2.25E+02	2.04E+02	8.68E+01	2.24E+01	1.45E+01	1.11E+01	4.59E+00
7.00	2.06E+02	1.82E+02	6.85E+01	1.71E+01	1.08E+01	7.94E+00	2.89E+00
8.00	1.88E+02	1.63E+02	5.45E+01	1.35E+01	7.88E+00	5.64E+00	2.02E+00
9.00	1.72E+02	1.46E+02	4.40E+01	1.07E+01	5.67E+00	4.03E+00	1.56E+00
10.00	1.57E+02	1.30E+02	3.62E+01	8.53E+00	4.12E+00	2.95E+00	1.27E+00
12.50	1.21E+02	9.89E+01	2.42E+01	4.80E+00	2.18E+00	1.58E+00	7.63E−01
15.00	9.15E+01	7.57E+01	1.78E+01	2.84E+00	1.45E+00	1.05E+00	4.22E−01
17.50	6.95E+01	5.84E+01	1.37E+01	1.85E+00	1.06E+00	7.44E−01	2.35E−01
20.00	5.40E+01	4.54E+01	1.05E+01	1.32E+00	7.66E−01	5.17E−01	1.43E−01
22.50	4.31E+01	3.58E+01	7.93E+00	1.01E+00	5.32E−01	3.50E−01	9.69E−02
25.00	3.53E+01	2.87E+01	5.90E+00	7.82E−01	3.64E−01	2.37E−01	7.20E−02
27.50	2.96E+01	2.35E+01	4.42E+00	6.08E−01	2.52E−01	1.64E−01	5.68E−02
30.00	2.52E+01	1.95E+01	3.37E+00	4.69E−01	1.79E−01	1.18E−01	4.62E−02
35.00	1.88E+01	1.42E+01	2.13E+00	2.76E−01	1.02E−01	6.92E−02	3.11E−02
40.00	1.42E+01	1.08E+01	1.51E+00	1.67E−01	6.74E−02	4.67E−02	2.05E−02
45.00	1.07E+01	8.28E+00	1.15E+00	1.06E−01	4.91E−02	3.42E−02	1.33E−02
50.00	8.04E+00	6.31E+00	9.01E−01	7.29E−02	3.74E−02	2.59E−02	8.51E−03
55.00	5.99E+00	4.76E+00	7.03E−01	5.32E−02	2.90E−02	1.98E−02	5.51E−03
60.00	4.46E+00	3.57E+00	5.45E−01	4.10E−02	2.27E−02	1.51E−02	3.65E−03
65.00	3.34E+00	2.68E+00	4.21E−01	3.31E−02	1.79E−02	1.16E−02	2.50E−03
70.00	2.55E+00	2.04E+00	3.29E−01	2.76E−02	1.43E−02	9.05E−03	1.79E−03
75.00	1.99E+00	1.59E+00	2.61E−01	2.37E−02	1.17E−02	7.21E−03	1.35E−03
80.00	1.59E+00	1.27E+00	2.12E−01	2.09E−02	9.76E−03	5.90E−03	1.07E−03
85.00	1.32E+00	1.05E+00	1.78E−01	1.88E−02	8.36E−03	4.97E−03	8.80E−04
90.00	1.13E+00	8.92E−01	1.54E−01	1.73E−02	7.34E−03	4.31E−03	7.58E−04
95.00	9.95E−01	7.86E−01	1.38E−01	1.62E−02	6.60E−03	3.83E−03	6.74E−04
105.00	8.46E−01	6.67E−01	1.20E−01	1.49E−02	5.65E−03	3.23E−03	5.70E−04
120.00	7.78E−01	6.14E−01	1.12E−01	1.39E−02	4.91E−03	2.75E−03	4.90E−04
135.00	7.87E−01	6.22E−01	1.15E−01	1.36E−02	4.54E−03	2.51E−03	4.49E−04
150.00	8.15E−01	6.46E−01	1.20E−01	1.34E−02	4.32E−03	2.37E−03	4.26E−04
165.00	8.38E−01	6.66E−01	1.23E−01	1.33E−02	4.21E−03	2.29E−03	4.15E−04
180.00	8.46E−01	6.73E−01	1.25E−01	1.33E−02	4.17E−03	2.27E−03	4.12E−04
total	1.01E+02	8.28E+01	2.12E+01	4.79E+00	2.87E+00	2.22E+00	1.12E+00
rel ff	1.26E+02	9.57E+01	2.04E+01	4.83E+00	2.93E+00	2.29E+00	1.17E+00
nrl ff	1.31E+02	9.97E+01	2.17E+01	5.20E+00	3.17E+00	2.48E+00	1.27E+00

TABLE 1. Predicted *S*-matrix differential elastic scattering cross sections for photon energies (50.0, 59.54, 145.4, 316.5, 411.8, 468.1, 661.6, 778.9, 964.0, 1004.8, 1112.1, 1274.5, 1408.0 and 1500.0). The angle integrated total cross sections for each element and energies are presented. ''total'' represents total cross sections from this work, ''rel ff'' represents total cross sections calculated from the relativistic form factor and ''nrl ff'' represents total cross sections calculated from the nonrelativistic form factor—Continued[a]

θ (deg)	Photon energy (keV)						
	778.9	964.0	1004.8	1112.1	1274.5	1408.0	1500.0
Holmium ($Z=67$)							
0.00	3.50E+02	3.50E+02	3.50E+02	3.50E+02	3.50E+02	3.49E+02	3.49E+02
0.01	3.50E+02	3.50E+02	3.49E+02	3.49E+02	3.49E+02	3.49E+02	3.48E+02
0.02	3.49E+02	3.49E+02	3.49E+02	3.48E+02	3.48E+02	3.47E+02	3.46E+02
0.04	3.47E+02	3.45E+02	3.45E+02	3.43E+02	3.41E+02	3.40E+02	3.38E+02
0.06	3.43E+02	3.40E+02	3.39E+02	3.37E+02	3.33E+02	3.29E+02	3.26E+02
0.10	3.32E+02	3.25E+02	3.23E+02	3.18E+02	3.10E+02	3.04E+02	3.00E+02
0.20	2.98E+02	2.81E+02	2.77E+02	2.68E+02	2.54E+02	2.43E+02	2.36E+02
0.30	2.63E+02	2.40E+02	2.35E+02	2.22E+02	2.03E+02	1.89E+02	1.79E+02
0.40	2.31E+02	2.02E+02	1.96E+02	1.82E+02	1.61E+02	1.46E+02	1.37E+02
0.50	2.01E+02	1.70E+02	1.64E+02	1.48E+02	1.28E+02	1.14E+02	1.05E+02
0.60	1.75E+02	1.43E+02	1.36E+02	1.21E+02	1.02E+02	8.98E+01	8.25E+01
0.70	1.52E+02	1.20E+02	1.14E+02	1.00E+02	8.26E+01	7.12E+01	6.46E+01
0.80	1.32E+02	1.02E+02	9.60E+01	8.30E+01	6.71E+01	5.69E+01	5.11E+01
1.00	1.01E+02	7.37E+01	6.89E+01	5.81E+01	4.55E+01	3.77E+01	3.33E+01
1.20	7.74E+01	5.44E+01	5.05E+01	4.19E+01	3.24E+01	2.69E+01	2.40E+01
1.50	5.35E+01	3.60E+01	3.32E+01	2.75E+01	2.17E+01	1.88E+01	1.76E+01
1.70	4.27E+01	2.84E+01	2.63E+01	2.18E+01	1.75E+01	1.56E+01	1.49E+01
2.00	3.17E+01	2.14E+01	1.98E+01	1.66E+01	1.33E+01	1.16E+01	1.07E+01
2.50	2.13E+01	1.50E+01	1.40E+01	1.16E+01	8.54E+00	6.23E+00	4.77E+00
3.00	1.57E+01	1.09E+01	1.00E+01	8.03E+00	5.31E+00	3.35E+00	2.24E+00
3.50	1.18E+01	7.53E+00	6.83E+00	5.23E+00	3.33E+00	2.14E+00	1.49E+00
4.00	8.84E+00	5.07E+00	4.51E+00	3.36E+00	2.23E+00	1.66E+00	1.39E+00
5.00	4.89E+00	2.50E+00	2.20E+00	1.64E+00	1.27E+00	1.26E+00	1.43E+00
6.00	2.89E+00	1.57E+00	1.41E+00	1.10E+00	8.58E−01	7.97E−01	8.15E−01
7.00	1.92E+00	1.19E+00	1.09E+00	8.71E−01	6.00E−01	4.06E−01	2.88E−01
8.00	1.41E+00	9.38E−01	8.63E−01	6.78E−01	4.05E−01	2.10E−01	1.12E−01
9.00	1.09E+00	6.99E−01	6.35E−01	4.79E−01	2.65E−01	1.28E−01	6.44E−02
10.00	8.52E−01	4.93E−01	4.38E−01	3.15E−01	1.75E−01	9.30E−02	5.42E−02
12.50	4.48E−01	2.00E−01	1.70E−01	1.16E−01	7.65E−02	6.56E−02	6.68E−02
15.00	2.34E−01	1.01E−01	8.66E−02	6.15E−02	4.67E−02	4.90E−02	6.04E−02
17.50	1.34E−01	6.63E−02	5.85E−02	4.43E−02	3.34E−02	2.99E−02	2.96E−02
20.00	8.70E−02	5.03E−02	4.56E−02	3.59E−02	2.45E−02	1.63E−02	1.12E−02
22.50	6.25E−02	3.96E−02	3.64E−02	2.86E−02	1.72E−02	8.82E−03	4.59E−03
25.00	4.78E−02	3.06E−02	2.79E−02	2.12E−02	1.15E−02	5.04E−03	2.27E−03
27.50	3.77E−02	2.28E−02	2.04E−02	1.47E−02	7.31E−03	3.04E−03	1.34E−03
30.00	2.99E−02	1.65E−02	1.44E−02	9.78E−03	4.56E−03	1.90E−03	8.75E−04
35.00	1.87E−02	8.31E−03	6.90E−03	4.14E−03	1.74E−03	7.59E−04	3.96E−04
40.00	1.12E−02	4.15E−03	3.31E−03	1.80E−03	7.01E−04	3.16E−04	1.81E−04
45.00	6.65E−03	2.12E−03	1.65E−03	8.41E−04	3.12E−04	1.45E−04	8.85E−05
50.00	3.94E−03	1.13E−03	8.62E−04	4.25E−04	1.56E−04	7.45E−05	4.79E−05
55.00	2.39E−03	6.43E−04	4.86E−04	2.39E−04	9.13E−05	4.77E−05	3.35E−05
60.00	1.51E−03	3.96E−04	3.00E−04	1.51E−04	6.32E−05	3.74E−05	2.94E−05
65.00	1.00E−03	2.64E−04	2.02E−04	1.06E−04	4.90E−05	3.27E−05	2.85E−05
70.00	7.11E−04	1.93E−04	1.50E−04	8.24E−05	4.19E−05	3.07E−05	2.88E−05
75.00	5.38E−04	1.53E−04	1.21E−04	6.94E−05	3.81E−05	2.98E−05	2.90E−05
80.00	4.32E−04	1.30E−04	1.04E−04	6.20E−05	3.61E−05	2.91E−05	2.87E−05
85.00	3.63E−04	1.15E−04	9.31E−05	5.78E−05	3.51E−05	2.89E−05	2.84E−05
90.00	3.19E−04	1.06E−04	8.66E−05	5.54E−05	3.49E−05	2.90E−05	2.83E−05
95.00	2.88E−04	9.95E−05	8.23E−05	5.39E−05	3.49E−05	2.92E−05	2.83E−05
105.00	2.50E−04	9.23E−05	7.76E−05	5.29E−05	3.58E−05	3.04E−05	2.92E−05
120.00	2.22E−04	8.76E−05	7.48E−05	5.32E−05	3.79E−05	3.27E−05	3.13E−05
135.00	2.08E−04	8.71E−05	7.54E−05	5.53E−05	4.07E−05	3.51E−05	3.29E−05
150.00	2.01E−04	8.75E−05	7.64E−05	5.73E−05	4.30E−05	3.71E−05	3.43E−05
165.00	1.98E−04	8.83E−05	7.75E−05	5.89E−05	4.48E−05	3.86E−05	3.54E−05
180.00	1.97E−04	8.86E−05	7.79E−05	5.95E−05	4.55E−05	3.92E−05	3.59E−05
total	8.07E−01	5.29E−01	4.87E−01	3.98E−01	3.01E−01	2.45E−01	2.19E−01
rel ff	8.49E−01	5.58E−01	5.14E−01	4.20E−01	3.20E−01	2.63E−01	2.33E−01
nrl ff	9.21E−01	6.06E−01	5.58E−01	4.56E−01	3.48E−01	2.86E−01	2.53E−01

TABLE 1. Predicted *S*-matrix differential elastic scattering cross sections for photon energies (50.0, 59.54, 145.4, 316.5, 411.8, 468.1, 661.6, 778.9, 964.0, 1004.8, 1112.1, 1274.5, 1408.0 and 1500.0). The angle integrated total cross sections for each element and energies are presented. ''total'' represents total cross sections from this work, ''rel ff'' represents total cross sections calculated from the relativistic form factor and ''nrl ff'' represents total cross sections calculated from the nonrelativistic form factor—Continued[a]

θ (deg)	Photon energy (keV)						
	50.0	59.5	145.4	316.5	411.8	468.1	661.6
Erbium ($Z=68$)							
0.00	3.46E+02	3.49E+02	3.64E+02	3.62E+02	3.61E+02	3.61E+02	3.61E+02
0.01	3.46E+02	3.49E+02	3.64E+02	3.62E+02	3.61E+02	3.61E+02	3.60E+02
0.02	3.46E+02	3.49E+02	3.64E+02	3.61E+02	3.61E+02	3.61E+02	3.60E+02
0.04	3.46E+02	3.49E+02	3.64E+02	3.61E+02	3.60E+02	3.60E+02	3.58E+02
0.06	3.46E+02	3.49E+02	3.64E+02	3.61E+02	3.59E+02	3.58E+02	3.55E+02
0.10	3.46E+02	3.49E+02	3.63E+02	3.58E+02	3.56E+02	3.54E+02	3.47E+02
0.20	3.46E+02	3.49E+02	3.61E+02	3.49E+02	3.42E+02	3.37E+02	3.19E+02
0.30	3.46E+02	3.48E+02	3.58E+02	3.37E+02	3.24E+02	3.16E+02	2.88E+02
0.40	3.45E+02	3.47E+02	3.53E+02	3.23E+02	3.04E+02	2.94E+02	2.59E+02
0.50	3.44E+02	3.46E+02	3.48E+02	3.08E+02	2.85E+02	2.73E+02	2.31E+02
0.60	3.44E+02	3.45E+02	3.42E+02	2.93E+02	2.67E+02	2.52E+02	2.06E+02
0.70	3.43E+02	3.44E+02	3.36E+02	2.79E+02	2.49E+02	2.33E+02	1.83E+02
0.80	3.42E+02	3.42E+02	3.29E+02	2.65E+02	2.32E+02	2.15E+02	1.63E+02
1.00	3.39E+02	3.38E+02	3.16E+02	2.38E+02	2.01E+02	1.82E+02	1.28E+02
1.20	3.36E+02	3.34E+02	3.02E+02	2.13E+02	1.74E+02	1.54E+02	1.02E+02
1.50	3.31E+02	3.27E+02	2.82E+02	1.80E+02	1.39E+02	1.20E+02	7.36E+01
1.70	3.26E+02	3.22E+02	2.69E+02	1.61E+02	1.20E+02	1.02E+02	5.97E+01
2.00	3.20E+02	3.14E+02	2.50E+02	1.36E+02	9.74E+01	8.06E+01	4.44E+01
2.50	3.08E+02	3.00E+02	2.21E+02	1.03E+02	6.95E+01	5.59E+01	2.92E+01
3.00	2.97E+02	2.86E+02	1.94E+02	7.91E+01	5.06E+01	4.02E+01	2.13E+01
3.50	2.86E+02	2.73E+02	1.70E+02	6.15E+01	3.80E+01	3.02E+01	1.66E+01
4.00	2.75E+02	2.60E+02	1.49E+02	4.87E+01	2.96E+01	2.36E+01	1.32E+01
5.00	2.53E+02	2.34E+02	1.16E+02	3.23E+01	2.01E+01	1.59E+01	8.13E+00
6.00	2.32E+02	2.11E+02	9.04E+01	2.31E+01	1.50E+01	1.14E+01	4.84E+00
7.00	2.12E+02	1.89E+02	7.13E+01	1.76E+01	1.12E+01	8.28E+00	3.03E+00
8.00	1.95E+02	1.69E+02	5.68E+01	1.39E+01	8.26E+00	5.92E+00	2.10E+00
9.00	1.78E+02	1.51E+02	4.58E+01	1.11E+01	5.97E+00	4.24E+00	1.61E+00
10.00	1.62E+02	1.35E+02	3.76E+01	8.88E+00	4.35E+00	3.10E+00	1.31E+00
12.50	1.26E+02	1.03E+02	2.49E+01	5.04E+00	2.27E+00	1.65E+00	7.98E−01
15.00	9.52E+01	7.85E+01	1.83E+01	2.99E+00	1.50E+00	1.08E+00	4.48E−01
17.50	7.22E+01	6.05E+01	1.42E+01	1.93E+00	1.10E+00	7.74E−01	2.50E−01
20.00	5.58E+01	4.70E+01	1.09E+01	1.38E+00	8.01E−01	5.43E−01	1.51E−01
22.50	4.44E+01	3.70E+01	8.30E+00	1.04E+00	5.61E−01	3.70E−01	1.01E−01
25.00	3.62E+01	2.96E+01	6.21E+00	8.14E−01	3.86E−01	2.52E−01	7.46E−02
27.50	3.02E+01	2.41E+01	4.65E+00	6.35E−01	2.67E−01	1.74E−01	5.86E−02
30.00	2.56E+01	2.00E+01	3.54E+00	4.92E−01	1.90E−01	1.25E−01	4.76E−02
35.00	1.90E+01	1.45E+01	2.22E+00	2.92E−01	1.07E−01	7.22E−02	3.21E−02
40.00	1.45E+01	1.10E+01	1.57E+00	1.76E−01	7.00E−02	4.83E−02	2.14E−02
45.00	1.10E+01	8.44E+00	1.19E+00	1.12E−01	5.06E−02	3.53E−02	1.39E−02
50.00	8.23E+00	6.45E+00	9.33E−01	7.64E−02	3.85E−02	2.68E−02	9.02E−03
55.00	6.14E+00	4.89E+00	7.32E−01	5.55E−02	3.00E−02	2.05E−02	5.88E−03
60.00	4.57E+00	3.67E+00	5.71E−01	4.26E−02	2.35E−02	1.58E−02	3.92E−03
65.00	3.43E+00	2.76E+00	4.44E−01	3.42E−02	1.87E−02	1.22E−02	2.70E−03
70.00	2.61E+00	2.10E+00	3.48E−01	2.86E−02	1.50E−02	9.55E−03	1.94E−03
75.00	2.02E+00	1.63E+00	2.77E−01	2.46E−02	1.23E−02	7.65E−03	1.47E−03
80.00	1.61E+00	1.29E+00	2.25E−01	2.17E−02	1.03E−02	6.29E−03	1.16E−03
85.00	1.32E+00	1.06E+00	1.89E−01	1.96E−02	8.87E−03	5.32E−03	9.64E−04
90.00	1.12E+00	9.01E−01	1.64E−01	1.81E−02	7.83E−03	4.63E−03	8.32E−04
95.00	9.87E−01	7.89E−01	1.46E−01	1.70E−02	7.06E−03	4.13E−03	7.41E−04
105.00	8.31E−01	6.64E−01	1.27E−01	1.56E−02	6.07E−03	3.50E−03	6.27E−04
120.00	7.57E−01	6.05E−01	1.18E−01	1.48E−02	5.31E−03	3.00E−03	5.40E−04
135.00	7.61E−01	6.10E−01	1.20E−01	1.45E−02	4.92E−03	2.74E−03	4.95E−04
150.00	7.86E−01	6.31E−01	1.25E−01	1.43E−02	4.70E−03	2.59E−03	4.70E−04
165.00	8.07E−01	6.49E−01	1.29E−01	1.43E−02	4.58E−03	2.51E−03	4.57E−04
180.00	8.15E−01	6.56E−01	1.31E−01	1.42E−02	4.54E−03	2.48E−03	4.53E−04
total	1.03E+02	8.51E+01	2.20E+01	4.99E+00	2.99E+00	2.31E+00	1.17E+00
rel ff	1.31E+02	9.95E+01	2.12E+01	5.03E+00	3.05E+00	2.39E+00	1.22E+00
nrl ff	1.37E+02	1.04E+02	2.26E+01	5.43E+00	3.31E+00	2.59E+00	1.32E+00

TABLE 1. Predicted *S*-matrix differential elastic scattering cross sections for photon energies (50.0, 59.54, 145.4, 316.5, 411.8, 468.1, 661.6, 778.9, 964.0, 1004.8, 1112.1, 1274.5, 1408.0 and 1500.0). The angle integrated total cross sections for each element and energies are presented. ''total'' represents total cross sections from this work, ''rel ff'' represents total cross sections calculated from the relativistic form factor and ''nrl ff'' represents total cross sections calculated from the nonrelativistic form factor—Continued[a]

θ (deg)	Photon energy (keV)						
	778.9	964.0	1004.8	1112.1	1274.5	1408.0	1500.0
Erbium ($Z=68$)							
0.00	3.61E+02	3.60E+02	3.60E+02	3.60E+02	3.60E+02	3.60E+02	3.59E+02
0.01	3.60E+02	3.60E+02	3.60E+02	3.60E+02	3.59E+02	3.59E+02	3.59E+02
0.02	3.60E+02	3.59E+02	3.59E+02	3.59E+02	3.58E+02	3.57E+02	3.56E+02
0.04	3.57E+02	3.55E+02	3.55E+02	3.54E+02	3.52E+02	3.50E+02	3.49E+02
0.06	3.53E+02	3.50E+02	3.49E+02	3.47E+02	3.43E+02	3.39E+02	3.36E+02
0.10	3.43E+02	3.35E+02	3.33E+02	3.28E+02	3.20E+02	3.14E+02	3.10E+02
0.20	3.08E+02	2.90E+02	2.87E+02	2.77E+02	2.63E+02	2.51E+02	2.44E+02
0.30	2.72E+02	2.48E+02	2.43E+02	2.30E+02	2.11E+02	1.96E+02	1.86E+02
0.40	2.39E+02	2.10E+02	2.04E+02	1.89E+02	1.68E+02	1.52E+02	1.42E+02
0.50	2.09E+02	1.77E+02	1.70E+02	1.54E+02	1.33E+02	1.19E+02	1.10E+02
0.60	1.82E+02	1.48E+02	1.42E+02	1.26E+02	1.07E+02	9.35E+01	8.59E+01
0.70	1.58E+02	1.25E+02	1.19E+02	1.04E+02	8.60E+01	7.42E+01	6.74E+01
0.80	1.37E+02	1.06E+02	1.00E+02	8.64E+01	6.99E+01	5.93E+01	5.33E+01
1.00	1.05E+02	7.67E+01	7.18E+01	6.05E+01	4.73E+01	3.92E+01	3.46E+01
1.20	8.07E+01	5.66E+01	5.26E+01	4.36E+01	3.36E+01	2.78E+01	2.47E+01
1.50	5.57E+01	3.74E+01	3.45E+01	2.84E+01	2.23E+01	1.93E+01	1.80E+01
1.70	4.44E+01	2.95E+01	2.72E+01	2.25E+01	1.80E+01	1.60E+01	1.53E+01
2.00	3.28E+01	2.20E+01	2.04E+01	1.71E+01	1.37E+01	1.20E+01	1.12E+01
2.50	2.20E+01	1.54E+01	1.44E+01	1.20E+01	8.90E+00	6.60E+00	5.13E+00
3.00	1.61E+01	1.13E+01	1.04E+01	8.39E+00	5.58E+00	3.54E+00	2.36E+00
3.50	1.22E+01	7.91E+00	7.19E+00	5.53E+00	3.51E+00	2.21E+00	1.51E+00
4.00	9.22E+00	5.36E+00	4.78E+00	3.56E+00	2.34E+00	1.69E+00	1.37E+00
5.00	5.14E+00	2.62E+00	2.30E+00	1.72E+00	1.31E+00	1.29E+00	1.46E+00
6.00	3.03E+00	1.62E+00	1.45E+00	1.13E+00	8.87E−01	8.48E−01	8.98E−01
7.00	2.00E+00	1.23E+00	1.12E+00	8.92E−01	6.25E−01	4.39E−01	3.25E−01
8.00	1.46E+00	9.71E−01	8.95E−01	7.06E−01	4.27E−01	2.25E−01	1.22E−01
9.00	1.13E+00	7.33E−01	6.68E−01	5.08E−01	2.82E−01	1.34E−01	6.68E−02
10.00	8.87E−01	5.23E−01	4.66E−01	3.38E−01	1.86E−01	9.60E−02	5.39E−02
12.50	4.72E−01	2.14E−01	1.82E−01	1.24E−01	8.01E−02	6.64E−02	6.52E−02
15.00	2.47E−01	1.06E−01	9.05E−02	6.38E−02	4.80E−02	5.05E−02	6.27E−02
17.50	1.41E−01	6.82E−02	6.00E−02	4.50E−02	3.42E−02	3.16E−02	3.25E−02
20.00	9.08E−02	5.15E−02	4.65E−02	3.65E−02	2.52E−02	1.74E−02	1.25E−02
22.50	6.47E−02	4.07E−02	3.73E−02	2.94E−02	1.80E−02	9.46E−03	5.06E−03
25.00	4.93E−02	3.16E−02	2.89E−02	2.21E−02	1.21E−02	5.41E−03	2.46E−03
27.50	3.88E−02	2.38E−02	2.14E−02	1.56E−02	7.82E−03	3.26E−03	1.43E−03
30.00	3.10E−02	1.74E−02	1.53E−02	1.05E−02	4.92E−03	2.05E−03	9.30E−04
35.00	1.95E−02	8.86E−03	7.40E−03	4.49E−03	1.91E−03	8.25E−04	4.24E−04
40.00	1.18E−02	4.47E−03	3.58E−03	1.97E−03	7.73E−04	3.48E−04	1.97E−04
45.00	7.08E−03	2.31E−03	1.79E−03	9.26E−04	3.46E−04	1.60E−04	9.74E−05
50.00	4.23E−03	1.24E−03	9.45E−04	4.69E−04	1.73E−04	8.27E−05	5.30E−05
55.00	2.58E−03	7.06E−04	5.34E−04	2.64E−04	1.01E−04	5.28E−05	3.69E−05
60.00	1.64E−03	4.36E−04	3.31E−04	1.67E−04	6.99E−05	4.12E−05	3.22E−05
65.00	1.10E−03	2.92E−04	2.23E−04	1.17E−04	5.41E−05	3.58E−05	3.10E−05
70.00	7.80E−04	2.13E−04	1.66E−04	9.10E−05	4.60E−05	3.35E−05	3.12E−05
75.00	5.91E−04	1.69E−04	1.33E−04	7.66E−05	4.18E−05	3.24E−05	3.14E−05
80.00	4.75E−04	1.43E−04	1.14E−04	6.83E−05	3.94E−05	3.16E−05	3.10E−05
85.00	4.00E−04	1.27E−04	1.03E−04	6.34E−05	3.83E−05	3.13E−05	3.06E−05
90.00	3.51E−04	1.17E−04	9.54E−05	6.07E−05	3.79E−05	3.13E−05	3.05E−05
95.00	3.18E−04	1.09E−04	9.04E−05	5.90E−05	3.78E−05	3.15E−05	3.04E−05
105.00	2.76E−04	1.01E−04	8.50E−05	5.76E−05	3.86E−05	3.26E−05	3.12E−05
120.00	2.44E−04	9.57E−05	8.16E−05	5.77E−05	4.07E−05	3.49E−05	3.32E−05
135.00	2.29E−04	9.48E−05	8.19E−05	5.96E−05	4.34E−05	3.73E−05	3.49E−05
150.00	2.21E−04	9.50E−05	8.27E−05	6.15E−05	4.57E−05	3.93E−05	3.63E−05
165.00	2.18E−04	9.57E−05	8.38E−05	6.31E−05	4.75E−05	4.08E−05	3.74E−05
180.00	2.16E−04	9.60E−05	8.42E−05	6.37E−05	4.82E−05	4.14E−05	3.79E−05
total	8.40E−01	5.50E−01	5.07E−01	4.14E−01	3.13E−01	2.55E−01	2.28E−01
rel ff	8.85E−01	5.82E−01	5.36E−01	4.38E−01	3.34E−01	2.75E−01	2.43E−01
nrl ff	9.62E−01	6.33E−01	5.83E−01	4.77E−01	3.63E−01	2.99E−01	2.64E−01

TABLE 1. Predicted *S*-matrix differential elastic scattering cross sections for photon energies (50.0, 59.54, 145.4, 316.5, 411.8, 468.1, 661.6, 778.9, 964.0, 1004.8, 1112.1, 1274.5, 1408.0 and 1500.0). The angle integrated total cross sections for each element and energies are presented. ''total'' represents total cross sections from this work, ''rel ff'' represents total cross sections calculated from the relativistic form factor and ''nrl ff'' represents total cross sections calculated from the nonrelativistic form factor—Continued[a]

θ (deg)	Photon energy (keV)						
	50.0	59.5	145.4	316.5	411.8	468.1	661.6
Thulium ($Z=69$)							
0.00	3.56E+02	3.59E+02	3.75E+02	3.72E+02	3.72E+02	3.72E+02	3.71E+02
0.01	3.56E+02	3.59E+02	3.75E+02	3.72E+02	3.72E+02	3.71E+02	3.71E+02
0.02	3.56E+02	3.59E+02	3.74E+02	3.72E+02	3.71E+02	3.71E+02	3.71E+02
0.04	3.56E+02	3.59E+02	3.74E+02	3.72E+02	3.71E+02	3.71E+02	3.69E+02
0.06	3.56E+02	3.59E+02	3.74E+02	3.71E+02	3.70E+02	3.69E+02	3.66E+02
0.10	3.56E+02	3.59E+02	3.74E+02	3.69E+02	3.66E+02	3.65E+02	3.58E+02
0.20	3.55E+02	3.58E+02	3.72E+02	3.60E+02	3.52E+02	3.47E+02	3.29E+02
0.30	3.55E+02	3.58E+02	3.69E+02	3.47E+02	3.34E+02	3.26E+02	2.98E+02
0.40	3.54E+02	3.57E+02	3.64E+02	3.33E+02	3.14E+02	3.03E+02	2.68E+02
0.50	3.54E+02	3.56E+02	3.59E+02	3.18E+02	2.95E+02	2.82E+02	2.40E+02
0.60	3.53E+02	3.55E+02	3.53E+02	3.03E+02	2.76E+02	2.61E+02	2.14E+02
0.70	3.52E+02	3.53E+02	3.47E+02	2.88E+02	2.58E+02	2.41E+02	1.90E+02
0.80	3.51E+02	3.52E+02	3.40E+02	2.74E+02	2.41E+02	2.23E+02	1.69E+02
1.00	3.49E+02	3.48E+02	3.26E+02	2.46E+02	2.09E+02	1.89E+02	1.33E+02
1.20	3.46E+02	3.44E+02	3.12E+02	2.21E+02	1.80E+02	1.60E+02	1.06E+02
1.50	3.40E+02	3.37E+02	2.91E+02	1.87E+02	1.45E+02	1.25E+02	7.66E+01
1.70	3.36E+02	3.31E+02	2.78E+02	1.67E+02	1.25E+02	1.06E+02	6.21E+01
2.00	3.29E+02	3.23E+02	2.59E+02	1.41E+02	1.01E+02	8.39E+01	4.62E+01
2.50	3.18E+02	3.09E+02	2.29E+02	1.07E+02	7.24E+01	5.82E+01	3.03E+01
3.00	3.06E+02	2.95E+02	2.01E+02	8.23E+01	5.27E+01	4.18E+01	2.19E+01
3.50	2.95E+02	2.81E+02	1.77E+02	6.40E+01	3.94E+01	3.13E+01	1.71E+01
4.00	2.83E+02	2.68E+02	1.55E+02	5.06E+01	3.06E+01	2.44E+01	1.36E+01
5.00	2.61E+02	2.42E+02	1.20E+02	3.35E+01	2.07E+01	1.64E+01	8.51E+00
6.00	2.39E+02	2.18E+02	9.40E+01	2.39E+01	1.54E+01	1.18E+01	5.09E+00
7.00	2.19E+02	1.96E+02	7.42E+01	1.82E+01	1.17E+01	8.62E+00	3.18E+00
8.00	2.01E+02	1.75E+02	5.91E+01	1.43E+01	8.64E+00	6.20E+00	2.19E+00
9.00	1.84E+02	1.57E+02	4.76E+01	1.15E+01	6.28E+00	4.46E+00	1.67E+00
10.00	1.68E+02	1.40E+02	3.90E+01	9.23E+00	4.58E+00	3.26E+00	1.36E+00
12.50	1.31E+02	1.06E+02	2.57E+01	5.29E+00	2.37E+00	1.71E+00	8.34E−01
15.00	9.90E+01	8.14E+01	1.89E+01	3.13E+00	1.55E+00	1.12E+00	4.74E−01
17.50	7.50E+01	6.27E+01	1.46E+01	2.02E+00	1.14E+00	8.04E−01	2.65E−01
20.00	5.79E+01	4.87E+01	1.13E+01	1.43E+00	8.37E−01	5.69E−01	1.59E−01
22.50	4.58E+01	3.83E+01	8.66E+00	1.08E+00	5.91E−01	3.91E−01	1.06E−01
25.00	3.72E+01	3.05E+01	6.51E+00	8.46E−01	4.09E−01	2.67E−01	7.73E−02
27.50	3.09E+01	2.48E+01	4.89E+00	6.63E−01	2.84E−01	1.84E−01	6.04E−02
30.00	2.61E+01	2.05E+01	3.72E+00	5.16E−01	2.01E−01	1.32E−01	4.90E−02
35.00	1.94E+01	1.48E+01	2.32E+00	3.08E−01	1.12E−01	7.54E−02	3.32E−02
40.00	1.47E+01	1.12E+01	1.62E+00	1.87E−01	7.27E−02	5.00E−02	2.22E−02
45.00	1.12E+01	8.62E+00	1.23E+00	1.19E−01	5.23E−02	3.63E−02	1.46E−02
50.00	8.43E+00	6.62E+00	9.66E−01	8.02E−02	3.97E−02	2.76E−02	9.54E−03
55.00	6.31E+00	5.03E+00	7.61E−01	5.79E−02	3.09E−02	2.12E−02	6.26E−03
60.00	4.71E+00	3.79E+00	5.97E−01	4.43E−02	2.44E−02	1.64E−02	4.20E−03
65.00	3.53E+00	2.86E+00	4.67E−01	3.55E−02	1.94E−02	1.28E−02	2.91E−03
70.00	2.68E+00	2.17E+00	3.67E−01	2.96E−02	1.57E−02	1.01E−02	2.10E−03
75.00	2.07E+00	1.68E+00	2.93E−01	2.55E−02	1.29E−02	8.10E−03	1.59E−03
80.00	1.64E+00	1.33E+00	2.39E−01	2.25E−02	1.09E−02	6.69E−03	1.27E−03
85.00	1.34E+00	1.09E+00	2.00E−01	2.04E−02	9.40E−03	5.69E−03	1.05E−03
90.00	1.14E+00	9.17E−01	1.73E−01	1.88E−02	8.32E−03	4.97E−03	9.11E−04
95.00	9.91E−01	8.00E−01	1.55E−01	1.77E−02	7.53E−03	4.45E−03	8.12E−04
105.00	8.28E−01	6.68E−01	1.34E−01	1.64E−02	6.51E−03	3.78E−03	6.89E−04
120.00	7.47E−01	6.04E−01	1.24E−01	1.56E−02	5.73E−03	3.26E−03	5.94E−04
135.00	7.48E−01	6.05E−01	1.26E−01	1.54E−02	5.33E−03	2.98E−03	5.44E−04
150.00	7.70E−01	6.25E−01	1.31E−01	1.53E−02	5.10E−03	2.83E−03	5.17E−04
165.00	7.90E−01	6.42E−01	1.35E−01	1.52E−02	4.97E−03	2.74E−03	5.03E−04
180.00	7.97E−01	6.48E−01	1.36E−01	1.52E−02	4.93E−03	2.72E−03	4.98E−04
total	1.06E+02	8.77E+01	2.29E+01	5.19E+00	3.11E+00	2.41E+00	1.21E+00
rel ff	1.37E+02	1.03E+02	2.20E+01	5.23E+00	3.18E+00	2.48E+00	1.27E+00
nrl ff	1.42E+02	1.08E+02	2.36E+01	5.66E+00	3.45E+00	2.70E+00	1.38E+00

TABLE 1. Predicted *S*-matrix differential elastic scattering cross sections for photon energies (50.0, 59.54, 145.4, 316.5, 411.8, 468.1, 661.6, 778.9, 964.0, 1004.8, 1112.1, 1274.5, 1408.0 and 1500.0). The angle integrated total cross sections for each element and energies are presented. ''total'' represents total cross sections from this work, ''rel ff'' represents total cross sections calculated from the relativistic form factor and ''nrl ff'' represents total cross sections calculated from the nonrelativistic form factor—Continued[a]

θ (deg)	Photon energy (keV)						
	778.9	964.0	1004.8	1112.1	1274.5	1408.0	1500.0
Thulium ($Z=69$)							
0.00	3.71E+02	3.71E+02	3.71E+02	3.71E+02	3.71E+02	3.70E+02	3.70E+02
0.01	3.71E+02	3.70E+02	3.70E+02	3.70E+02	3.70E+02	3.70E+02	3.69E+02
0.02	3.70E+02	3.70E+02	3.70E+02	3.69E+02	3.68E+02	3.67E+02	3.67E+02
0.04	3.68E+02	3.66E+02	3.65E+02	3.64E+02	3.62E+02	3.61E+02	3.59E+02
0.06	3.64E+02	3.61E+02	3.60E+02	3.57E+02	3.53E+02	3.50E+02	3.47E+02
0.10	3.53E+02	3.45E+02	3.43E+02	3.38E+02	3.31E+02	3.24E+02	3.20E+02
0.20	3.18E+02	3.00E+02	2.96E+02	2.86E+02	2.71E+02	2.60E+02	2.53E+02
0.30	2.81E+02	2.57E+02	2.52E+02	2.38E+02	2.19E+02	2.04E+02	1.94E+02
0.40	2.48E+02	2.18E+02	2.11E+02	1.96E+02	1.74E+02	1.58E+02	1.48E+02
0.50	2.16E+02	1.83E+02	1.77E+02	1.60E+02	1.39E+02	1.23E+02	1.14E+02
0.60	1.88E+02	1.54E+02	1.47E+02	1.31E+02	1.11E+02	9.73E+01	8.93E+01
0.70	1.64E+02	1.30E+02	1.24E+02	1.08E+02	8.95E+01	7.72E+01	7.01E+01
0.80	1.43E+02	1.10E+02	1.04E+02	8.99E+01	7.28E+01	6.18E+01	5.56E+01
1.00	1.09E+02	7.98E+01	7.47E+01	6.30E+01	4.92E+01	4.07E+01	3.60E+01
1.20	8.39E+01	5.89E+01	5.47E+01	4.54E+01	3.49E+01	2.87E+01	2.55E+01
1.50	5.80E+01	3.89E+01	3.59E+01	2.95E+01	2.31E+01	1.98E+01	1.84E+01
1.70	4.61E+01	3.05E+01	2.82E+01	2.33E+01	1.86E+01	1.65E+01	1.57E+01
2.00	3.40E+01	2.27E+01	2.10E+01	1.75E+01	1.42E+01	1.25E+01	1.18E+01
2.50	2.27E+01	1.58E+01	1.48E+01	1.23E+01	9.26E+00	6.98E+00	5.52E+00
3.00	1.66E+01	1.17E+01	1.08E+01	8.75E+00	5.87E+00	3.73E+00	2.50E+00
3.50	1.27E+01	8.29E+00	7.55E+00	5.84E+00	3.70E+00	2.30E+00	1.54E+00
4.00	9.60E+00	5.66E+00	5.06E+00	3.78E+00	2.45E+00	1.73E+00	1.35E+00
5.00	5.39E+00	2.75E+00	2.42E+00	1.80E+00	1.36E+00	1.33E+00	1.49E+00
6.00	3.17E+00	1.68E+00	1.49E+00	1.15E+00	9.17E−01	8.98E−01	9.80E−01
7.00	2.08E+00	1.26E+00	1.15E+00	9.14E−01	6.51E−01	4.74E−01	3.65E−01
8.00	1.51E+00	1.00E+00	9.25E−01	7.32E−01	4.50E−01	2.42E−01	1.34E−01
9.00	1.17E+00	7.68E−01	7.01E−01	5.36E−01	2.99E−01	1.42E−01	7.00E−02
10.00	9.22E−01	5.53E−01	4.95E−01	3.61E−01	1.97E−01	9.94E−02	5.41E−02
12.50	4.97E−01	2.27E−01	1.94E−01	1.32E−01	8.39E−02	6.72E−02	6.37E−02
15.00	2.62E−01	1.11E−01	9.47E−02	6.63E−02	4.95E−02	5.19E−02	6.46E−02
17.50	1.49E−01	7.04E−02	6.16E−02	4.59E−02	3.50E−02	3.32E−02	3.54E−02
20.00	9.48E−02	5.27E−02	4.75E−02	3.71E−02	2.60E−02	1.85E−02	1.39E−02
22.50	6.71E−02	4.17E−02	3.82E−02	3.02E−02	1.87E−02	1.01E−02	5.59E−03
25.00	5.09E−02	3.27E−02	2.99E−02	2.30E−02	1.28E−02	5.79E−03	2.67E−03
27.50	4.01E−02	2.47E−02	2.23E−02	1.64E−02	8.34E−03	3.50E−03	1.53E−03
30.00	3.20E−02	1.82E−02	1.61E−02	1.11E−02	5.30E−03	2.20E−03	9.90E−04
35.00	2.03E−02	9.43E−03	7.91E−03	4.86E−03	2.08E−03	8.95E−04	4.53E−04
40.00	1.25E−02	4.80E−03	3.86E−03	2.15E−03	8.51E−04	3.81E−04	2.14E−04
45.00	7.52E−03	2.50E−03	1.95E−03	1.02E−03	3.83E−04	1.77E−04	1.07E−04
50.00	4.53E−03	1.35E−03	1.03E−03	5.17E−04	1.92E−04	9.17E−05	5.85E−05
55.00	2.79E−03	7.73E−04	5.87E−04	2.92E−04	1.12E−04	5.83E−05	4.06E−05
60.00	1.78E−03	4.79E−04	3.64E−04	1.85E−04	7.73E−05	4.53E−05	3.53E−05
65.00	1.19E−03	3.21E−04	2.46E−04	1.30E−04	5.96E−05	3.92E−05	3.37E−05
70.00	8.53E−04	2.35E−04	1.83E−04	1.00E−04	5.06E−05	3.66E−05	3.39E−05
75.00	6.48E−04	1.87E−04	1.47E−04	8.44E−05	4.58E−05	3.52E−05	3.39E−05
80.00	5.22E−04	1.58E−04	1.26E−04	7.51E−05	4.31E−05	3.43E−05	3.35E−05
85.00	4.40E−04	1.40E−04	1.13E−04	6.96E−05	4.17E−05	3.38E−05	3.30E−05
90.00	3.87E−04	1.28E−04	1.05E−04	6.65E−05	4.12E−05	3.38E−05	3.27E−05
95.00	3.50E−04	1.20E−04	9.93E−05	6.45E−05	4.10E−05	3.39E−05	3.26E−05
105.00	3.04E−04	1.11E−04	9.31E−05	6.28E−05	4.17E−05	3.49E−05	3.33E−05
120.00	2.69E−04	1.05E−04	8.90E−05	6.25E−05	4.36E−05	3.72E−05	3.54E−05
135.00	2.52E−04	1.03E−04	8.89E−05	6.43E−05	4.63E−05	3.96E−05	3.70E−05
150.00	2.43E−04	1.03E−04	8.96E−05	6.61E−05	4.86E−05	4.16E−05	3.85E−05
165.00	2.39E−04	1.04E−04	9.05E−05	6.77E−05	5.04E−05	4.31E−05	3.96E−05
180.00	2.37E−04	1.04E−04	9.09E−05	6.83E−05	5.11E−05	4.37E−05	4.01E−05
total	8.73E−01	5.72E−01	5.28E−01	4.31E−01	3.25E−01	2.65E−01	2.37E−01
rel ff	9.22E−01	6.06E−01	5.59E−01	4.56E−01	3.48E−01	2.86E−01	2.53E−01
nrl ff	1.00E+00	6.61E−01	6.09E−01	4.98E−01	3.80E−01	3.12E−01	2.76E−01

TABLE 1. Predicted *S*-matrix differential elastic scattering cross sections for photon energies (50.0, 59.54, 145.4, 316.5, 411.8, 468.1, 661.6, 778.9, 964.0, 1004.8, 1112.1, 1274.5, 1408.0 and 1500.0). The angle integrated total cross sections for each element and energies are presented. ''total'' represents total cross sections from this work, ''rel ff'' represents total cross sections calculated from the relativistic form factor and ''nrl ff'' represents total cross sections calculated from the nonrelativistic form factor—Continued[a]

θ (deg)	Photon energy (keV)						
	50.0	59.5	145.4	316.5	411.8	468.1	661.6
Ytterbium ($Z=70$)							
0.00	3.65E+02	3.69E+02	3.85E+02	3.83E+02	3.83E+02	3.82E+02	3.82E+02
0.01	3.65E+02	3.69E+02	3.85E+02	3.83E+02	3.82E+02	3.82E+02	3.82E+02
0.02	3.65E+02	3.69E+02	3.85E+02	3.83E+02	3.82E+02	3.82E+02	3.81E+02
0.04	3.66E+02	3.69E+02	3.85E+02	3.82E+02	3.82E+02	3.81E+02	3.80E+02
0.06	3.66E+02	3.69E+02	3.85E+02	3.82E+02	3.81E+02	3.80E+02	3.77E+02
0.10	3.65E+02	3.69E+02	3.85E+02	3.80E+02	3.77E+02	3.75E+02	3.69E+02
0.20	3.65E+02	3.68E+02	3.82E+02	3.71E+02	3.63E+02	3.58E+02	3.39E+02
0.30	3.65E+02	3.68E+02	3.79E+02	3.58E+02	3.44E+02	3.36E+02	3.07E+02
0.40	3.64E+02	3.67E+02	3.75E+02	3.43E+02	3.24E+02	3.13E+02	2.77E+02
0.50	3.63E+02	3.66E+02	3.70E+02	3.28E+02	3.04E+02	2.91E+02	2.48E+02
0.60	3.63E+02	3.65E+02	3.63E+02	3.12E+02	2.85E+02	2.70E+02	2.21E+02
0.70	3.62E+02	3.63E+02	3.57E+02	2.97E+02	2.67E+02	2.50E+02	1.97E+02
0.80	3.61E+02	3.62E+02	3.50E+02	2.83E+02	2.49E+02	2.30E+02	1.75E+02
1.00	3.58E+02	3.58E+02	3.36E+02	2.55E+02	2.16E+02	1.96E+02	1.39E+02
1.20	3.55E+02	3.54E+02	3.21E+02	2.29E+02	1.87E+02	1.66E+02	1.10E+02
1.50	3.50E+02	3.46E+02	3.01E+02	1.94E+02	1.50E+02	1.30E+02	7.96E+01
1.70	3.46E+02	3.41E+02	2.87E+02	1.73E+02	1.30E+02	1.10E+02	6.46E+01
2.00	3.39E+02	3.33E+02	2.67E+02	1.46E+02	1.05E+02	8.72E+01	4.81E+01
2.50	3.27E+02	3.19E+02	2.36E+02	1.11E+02	7.53E+01	6.05E+01	3.14E+01
3.00	3.15E+02	3.04E+02	2.08E+02	8.56E+01	5.48E+01	4.34E+01	2.26E+01
3.50	3.03E+02	2.90E+02	1.83E+02	6.66E+01	4.10E+01	3.24E+01	1.76E+01
4.00	2.92E+02	2.76E+02	1.61E+02	5.27E+01	3.18E+01	2.52E+01	1.41E+01
5.00	2.69E+02	2.50E+02	1.25E+02	3.47E+01	2.14E+01	1.69E+01	8.88E+00
6.00	2.47E+02	2.25E+02	9.77E+01	2.47E+01	1.59E+01	1.22E+01	5.36E+00
7.00	2.27E+02	2.02E+02	7.71E+01	1.88E+01	1.21E+01	8.96E+00	3.33E+00
8.00	2.08E+02	1.81E+02	6.15E+01	1.48E+01	9.02E+00	6.49E+00	2.28E+00
9.00	1.91E+02	1.62E+02	4.95E+01	1.19E+01	6.59E+00	4.68E+00	1.73E+00
10.00	1.74E+02	1.45E+02	4.05E+01	9.59E+00	4.82E+00	3.43E+00	1.40E+00
12.50	1.36E+02	1.10E+02	2.66E+01	5.54E+00	2.47E+00	1.79E+00	8.69E−01
15.00	1.03E+02	8.44E+01	1.94E+01	3.29E+00	1.61E+00	1.16E+00	5.00E−01
17.50	7.80E+01	6.51E+01	1.50E+01	2.11E+00	1.18E+00	8.34E−01	2.81E−01
20.00	6.01E+01	5.06E+01	1.17E+01	1.49E+00	8.72E−01	5.95E−01	1.68E−01
22.50	4.74E+01	3.97E+01	9.02E+00	1.12E+00	6.22E−01	4.12E−01	1.11E−01
25.00	3.84E+01	3.16E+01	6.82E+00	8.79E−01	4.33E−01	2.82E−01	8.03E−02
27.50	3.18E+01	2.56E+01	5.14E+00	6.91E−01	3.01E−01	1.95E−01	6.24E−02
30.00	2.68E+01	2.11E+01	3.91E+00	5.41E−01	2.13E−01	1.39E−01	5.04E−02
35.00	1.98E+01	1.52E+01	2.42E+00	3.25E−01	1.18E−01	7.89E−02	3.42E−02
40.00	1.51E+01	1.15E+01	1.68E+00	1.97E−01	7.56E−02	5.18E−02	2.31E−02
45.00	1.15E+01	8.83E+00	1.27E+00	1.25E−01	5.40E−02	3.75E−02	1.53E−02
50.00	8.67E+00	6.80E+00	9.98E−01	8.43E−02	4.10E−02	2.84E−02	1.01E−02
55.00	6.50E+00	5.19E+00	7.89E−01	6.05E−02	3.19E−02	2.19E−02	6.66E−03
60.00	4.86E+00	3.92E+00	6.22E−01	4.61E−02	2.52E−02	1.70E−02	4.50E−03
65.00	3.65E+00	2.96E+00	4.89E−01	3.68E−02	2.02E−02	1.33E−02	3.13E−03
70.00	2.77E+00	2.25E+00	3.86E−01	3.07E−02	1.64E−02	1.06E−02	2.27E−03
75.00	2.14E+00	1.74E+00	3.09E−01	2.64E−02	1.36E−02	8.56E−03	1.73E−03
80.00	1.69E+00	1.38E+00	2.53E−01	2.33E−02	1.15E−02	7.11E−03	1.38E−03
85.00	1.38E+00	1.12E+00	2.12E−01	2.12E−02	9.94E−03	6.06E−03	1.15E−03
90.00	1.16E+00	9.43E−01	1.84E−01	1.96E−02	8.83E−03	5.32E−03	9.96E−04
95.00	1.01E+00	8.20E−01	1.64E−01	1.85E−02	8.02E−03	4.77E−03	8.89E−04
105.00	8.34E−01	6.79E−01	1.41E−01	1.72E−02	6.97E−03	4.08E−03	7.56E−04
120.00	7.47E−01	6.09E−01	1.31E−01	1.65E−02	6.16E−03	3.53E−03	6.52E−04
135.00	7.44E−01	6.08E−01	1.32E−01	1.63E−02	5.75E−03	3.24E−03	5.98E−04
150.00	7.65E−01	6.26E−01	1.37E−01	1.62E−02	5.52E−03	3.08E−03	5.67E−04
165.00	7.84E−01	6.42E−01	1.41E−01	1.62E−02	5.39E−03	2.99E−03	5.52E−04
180.00	7.91E−01	6.48E−01	1.43E−01	1.62E−02	5.35E−03	2.96E−03	5.47E−04
total	1.09E+02	9.05E+01	2.38E+01	5.39E+00	3.23E+00	2.50E+00	1.26E+00
rel ff	1.41E+02	1.07E+02	2.29E+01	5.45E+00	3.31E+00	2.59E+00	1.32E+00
nrl ff	1.48E+02	1.12E+02	2.46E+01	5.90E+00	3.60E+00	2.81E+00	1.44E+00

TABLE 1. Predicted *S*-matrix differential elastic scattering cross sections for photon energies (50.0, 59.54, 145.4, 316.5, 411.8, 468.1, 661.6, 778.9, 964.0, 1004.8, 1112.1, 1274.5, 1408.0 and 1500.0). The angle integrated total cross sections for each element and energies are presented. ''total'' represents total cross sections from this work, ''rel ff'' represents total cross sections calculated from the relativistic form factor and ''nrl ff'' represents total cross sections calculated from the nonrelativistic form factor—Continued[a]

θ (deg)	Photon energy (keV)						
	778.9	964.0	1004.8	1112.1	1274.5	1408.0	1500.0
Ytterbium ($Z=70$)							
0.00	3.82E+02	3.82E+02	3.82E+02	3.81E+02	3.81E+02	3.81E+02	3.81E+02
0.01	3.81E+02	3.81E+02	3.81E+02	3.81E+02	3.81E+02	3.80E+02	3.80E+02
0.02	3.81E+02	3.80E+02	3.80E+02	3.80E+02	3.79E+02	3.78E+02	3.77E+02
0.04	3.78E+02	3.77E+02	3.76E+02	3.75E+02	3.73E+02	3.71E+02	3.70E+02
0.06	3.75E+02	3.71E+02	3.70E+02	3.68E+02	3.64E+02	3.60E+02	3.57E+02
0.10	3.64E+02	3.56E+02	3.54E+02	3.49E+02	3.41E+02	3.34E+02	3.30E+02
0.20	3.28E+02	3.09E+02	3.06E+02	2.95E+02	2.80E+02	2.69E+02	2.61E+02
0.30	2.91E+02	2.65E+02	2.60E+02	2.46E+02	2.26E+02	2.11E+02	2.01E+02
0.40	2.56E+02	2.25E+02	2.19E+02	2.03E+02	1.81E+02	1.64E+02	1.53E+02
0.50	2.24E+02	1.90E+02	1.83E+02	1.66E+02	1.44E+02	1.28E+02	1.18E+02
0.60	1.95E+02	1.60E+02	1.53E+02	1.36E+02	1.15E+02	1.01E+02	9.28E+01
0.70	1.70E+02	1.35E+02	1.28E+02	1.13E+02	9.30E+01	8.03E+01	7.30E+01
0.80	1.48E+02	1.14E+02	1.08E+02	9.34E+01	7.57E+01	6.43E+01	5.79E+01
1.00	1.13E+02	8.30E+01	7.77E+01	6.55E+01	5.12E+01	4.24E+01	3.75E+01
1.20	8.73E+01	6.13E+01	5.70E+01	4.72E+01	3.62E+01	2.98E+01	2.63E+01
1.50	6.03E+01	4.04E+01	3.73E+01	3.06E+01	2.38E+01	2.04E+01	1.88E+01
1.70	4.80E+01	3.17E+01	2.92E+01	2.41E+01	1.91E+01	1.69E+01	1.62E+01
2.00	3.53E+01	2.34E+01	2.17E+01	1.81E+01	1.46E+01	1.29E+01	1.23E+01
2.50	2.34E+01	1.63E+01	1.52E+01	1.27E+01	9.61E+00	7.36E+00	5.92E+00
3.00	1.72E+01	1.21E+01	1.12E+01	9.09E+00	6.15E+00	3.95E+00	2.66E+00
3.50	1.31E+01	8.66E+00	7.90E+00	6.14E+00	3.89E+00	2.39E+00	1.58E+00
4.00	9.97E+00	5.96E+00	5.34E+00	4.00E+00	2.57E+00	1.77E+00	1.35E+00
5.00	5.66E+00	2.89E+00	2.54E+00	1.88E+00	1.41E+00	1.36E+00	1.50E+00
6.00	3.32E+00	1.74E+00	1.54E+00	1.19E+00	9.47E−01	9.45E−01	1.06E+00
7.00	2.17E+00	1.30E+00	1.18E+00	9.36E−01	6.76E−01	5.09E−01	4.08E−01
8.00	1.57E+00	1.04E+00	9.55E−01	7.58E−01	4.72E−01	2.60E−01	1.48E−01
9.00	1.21E+00	8.01E−01	7.33E−01	5.63E−01	3.16E−01	1.50E−01	7.41E−02
10.00	9.58E−01	5.83E−01	5.23E−01	3.84E−01	2.09E−01	1.03E−01	5.48E−02
12.50	5.23E−01	2.42E−01	2.07E−01	1.41E−01	8.80E−02	6.81E−02	6.21E−02
15.00	2.77E−01	1.17E−01	9.93E−02	6.91E−02	5.10E−02	5.32E−02	6.60E−02
17.50	1.56E−01	7.28E−02	6.35E−02	4.70E−02	3.59E−02	3.48E−02	3.82E−02
20.00	9.91E−02	5.40E−02	4.86E−02	3.77E−02	2.67E−02	1.97E−02	1.54E−02
22.50	6.96E−02	4.28E−02	3.91E−02	3.09E−02	1.94E−02	1.08E−02	6.18E−03
25.00	5.26E−02	3.37E−02	3.08E−02	2.38E−02	1.34E−02	6.21E−03	2.91E−03
27.50	4.13E−02	2.57E−02	2.32E−02	1.72E−02	8.86E−03	3.75E−03	1.65E−03
30.00	3.30E−02	1.91E−02	1.69E−02	1.18E−02	5.69E−03	2.36E−03	1.06E−03
35.00	2.11E−02	1.00E−02	8.44E−03	5.25E−03	2.27E−03	9.69E−04	4.84E−04
40.00	1.31E−02	5.15E−03	4.16E−03	2.34E−03	9.36E−04	4.17E−04	2.32E−04
45.00	7.97E−03	2.70E−03	2.12E−03	1.11E−03	4.24E−04	1.95E−04	1.17E−04
50.00	4.84E−03	1.47E−03	1.13E−03	5.69E−04	2.12E−04	1.01E−04	6.44E−05
55.00	3.00E−03	8.45E−04	6.44E−04	3.22E−04	1.24E−04	6.44E−05	4.47E−05
60.00	1.93E−03	5.25E−04	4.00E−04	2.04E−04	8.54E−05	4.98E−05	3.86E−05
65.00	1.30E−03	3.53E−04	2.71E−04	1.43E−04	6.56E−05	4.29E−05	3.67E−05
70.00	9.31E−04	2.59E−04	2.01E−04	1.11E−04	5.55E−05	3.99E−05	3.67E−05
75.00	7.10E−04	2.06E−04	1.62E−04	9.29E−05	5.01E−05	3.83E−05	3.67E−05
80.00	5.72E−04	1.74E−04	1.39E−04	8.25E−05	4.71E−05	3.72E−05	3.62E−05
85.00	4.83E−04	1.54E−04	1.24E−04	7.64E−05	4.55E−05	3.66E−05	3.55E−05
90.00	4.25E−04	1.41E−04	1.15E−04	7.29E−05	4.48E−05	3.65E−05	3.52E−05
95.00	3.85E−04	1.32E−04	1.09E−04	7.05E−05	4.45E−05	3.65E−05	3.50E−05
105.00	3.34E−04	1.22E−04	1.02E−04	6.83E−05	4.50E−05	3.74E−05	3.56E−05
120.00	2.95E−04	1.14E−04	9.71E−05	6.77E−05	4.68E−05	3.97E−05	3.76E−05
135.00	2.76E−04	1.12E−04	9.66E−05	6.94E−05	4.95E−05	4.21E−05	3.93E−05
150.00	2.66E−04	1.12E−04	9.71E−05	7.11E−05	5.18E−05	4.41E−05	4.08E−05
165.00	2.61E−04	1.12E−04	9.79E−05	7.26E−05	5.36E−05	4.56E−05	4.19E−05
180.00	2.60E−04	1.13E−04	9.83E−05	7.32E−05	5.43E−05	4.63E−05	4.24E−05
total	9.08E−01	5.95E−01	5.49E−01	4.48E−01	3.38E−01	2.76E−01	2.46E−01
rel ff	9.60E−01	6.31E−01	5.82E−01	4.75E−01	3.62E−01	2.98E−01	2.64E−01
nrl ff	1.05E+00	6.90E−01	6.36E−01	5.20E−01	3.96E−01	3.26E−01	2.88E−01

TABLE 1. Predicted *S*-matrix differential elastic scattering cross sections for photon energies (50.0, 59.54, 145.4, 316.5, 411.8, 468.1, 661.6, 778.9, 964.0, 1004.8, 1112.1, 1274.5, 1408.0 and 1500.0). The angle integrated total cross sections for each element and energies are presented. ''total'' represents total cross sections from this work, ''rel ff'' represents total cross sections calculated from the relativistic form factor and ''nrl ff'' represents total cross sections calculated from the nonrelativistic form factor—Continued[a]

θ (deg)	Photon energy (keV)						
	50.0	59.5	145.4	316.5	411.8	468.1	661.6
Lutetium ($Z=71$)							
0.00	3.76E+02	3.79E+02	3.96E+02	3.94E+02	3.94E+02	3.93E+02	3.93E+02
0.01	3.76E+02	3.79E+02	3.96E+02	3.94E+02	3.93E+02	3.93E+02	3.92E+02
0.02	3.76E+02	3.79E+02	3.96E+02	3.94E+02	3.93E+02	3.93E+02	3.92E+02
0.04	3.76E+02	3.79E+02	3.96E+02	3.93E+02	3.93E+02	3.92E+02	3.90E+02
0.06	3.76E+02	3.79E+02	3.96E+02	3.93E+02	3.91E+02	3.91E+02	3.88E+02
0.10	3.76E+02	3.79E+02	3.95E+02	3.91E+02	3.88E+02	3.86E+02	3.79E+02
0.20	3.75E+02	3.79E+02	3.93E+02	3.82E+02	3.73E+02	3.68E+02	3.49E+02
0.30	3.75E+02	3.78E+02	3.90E+02	3.68E+02	3.54E+02	3.46E+02	3.17E+02
0.40	3.74E+02	3.77E+02	3.85E+02	3.54E+02	3.34E+02	3.23E+02	2.86E+02
0.50	3.73E+02	3.76E+02	3.80E+02	3.38E+02	3.14E+02	3.00E+02	2.56E+02
0.60	3.73E+02	3.75E+02	3.74E+02	3.22E+02	2.94E+02	2.79E+02	2.29E+02
0.70	3.72E+02	3.73E+02	3.68E+02	3.07E+02	2.75E+02	2.58E+02	2.04E+02
0.80	3.71E+02	3.72E+02	3.60E+02	2.92E+02	2.57E+02	2.38E+02	1.81E+02
1.00	3.69E+02	3.68E+02	3.46E+02	2.63E+02	2.23E+02	2.02E+02	1.44E+02
1.20	3.66E+02	3.64E+02	3.31E+02	2.36E+02	1.93E+02	1.72E+02	1.15E+02
1.50	3.60E+02	3.56E+02	3.10E+02	2.00E+02	1.56E+02	1.34E+02	8.28E+01
1.70	3.56E+02	3.51E+02	2.96E+02	1.79E+02	1.35E+02	1.14E+02	6.72E+01
2.00	3.49E+02	3.43E+02	2.76E+02	1.52E+02	1.09E+02	9.06E+01	5.00E+01
2.50	3.37E+02	3.28E+02	2.44E+02	1.16E+02	7.83E+01	6.29E+01	3.25E+01
3.00	3.24E+02	3.13E+02	2.15E+02	8.90E+01	5.70E+01	4.51E+01	2.33E+01
3.50	3.13E+02	2.99E+02	1.90E+02	6.93E+01	4.26E+01	3.37E+01	1.81E+01
4.00	3.01E+02	2.85E+02	1.67E+02	5.48E+01	3.29E+01	2.61E+01	1.45E+01
5.00	2.77E+02	2.58E+02	1.29E+02	3.61E+01	2.20E+01	1.74E+01	9.25E+00
6.00	2.55E+02	2.33E+02	1.01E+02	2.56E+01	1.64E+01	1.26E+01	5.62E+00
7.00	2.34E+02	2.09E+02	8.02E+01	1.94E+01	1.25E+01	9.29E+00	3.50E+00
8.00	2.15E+02	1.87E+02	6.39E+01	1.53E+01	9.39E+00	6.77E+00	2.38E+00
9.00	1.97E+02	1.68E+02	5.15E+01	1.23E+01	6.91E+00	4.91E+00	1.79E+00
10.00	1.80E+02	1.50E+02	4.21E+01	9.94E+00	5.06E+00	3.60E+00	1.45E+00
12.50	1.41E+02	1.14E+02	2.75E+01	5.79E+00	2.58E+00	1.86E+00	9.04E−01
15.00	1.07E+02	8.75E+01	2.00E+01	3.45E+00	1.66E+00	1.20E+00	5.27E−01
17.50	8.13E+01	6.75E+01	1.55E+01	2.21E+00	1.22E+00	8.65E−01	2.98E−01
20.00	6.25E+01	5.25E+01	1.21E+01	1.55E+00	9.07E−01	6.21E−01	1.77E−01
22.50	4.92E+01	4.12E+01	9.38E+00	1.17E+00	6.52E−01	4.33E−01	1.16E−01
25.00	3.97E+01	3.28E+01	7.13E+00	9.12E−01	4.57E−01	2.98E−01	8.34E−02
27.50	3.28E+01	2.65E+01	5.39E+00	7.20E−01	3.19E−01	2.07E−01	6.45E−02
30.00	2.76E+01	2.18E+01	4.10E+00	5.65E−01	2.26E−01	1.47E−01	5.20E−02
35.00	2.03E+01	1.56E+01	2.53E+00	3.42E−01	1.24E−01	8.26E−02	3.53E−02
40.00	1.54E+01	1.17E+01	1.74E+00	2.08E−01	7.87E−02	5.37E−02	2.39E−02
45.00	1.18E+01	9.06E+00	1.31E+00	1.32E−01	5.59E−02	3.87E−02	1.60E−02
50.00	8.93E+00	6.99E+00	1.03E+00	8.86E−02	4.22E−02	2.93E−02	1.06E−02
55.00	6.73E+00	5.36E+00	8.17E−01	6.33E−02	3.29E−02	2.27E−02	7.06E−03
60.00	5.04E+00	4.07E+00	6.47E−01	4.80E−02	2.61E−02	1.77E−02	4.80E−03
65.00	3.79E+00	3.08E+00	5.11E−01	3.82E−02	2.09E−02	1.39E−02	3.36E−03
70.00	2.87E+00	2.35E+00	4.06E−01	3.18E−02	1.71E−02	1.11E−02	2.45E−03
75.00	2.22E+00	1.81E+00	3.26E−01	2.73E−02	1.42E−02	9.03E−03	1.87E−03
80.00	1.75E+00	1.43E+00	2.67E−01	2.42E−02	1.21E−02	7.53E−03	1.50E−03
85.00	1.42E+00	1.16E+00	2.25E−01	2.20E−02	1.05E−02	6.45E−03	1.25E−03
90.00	1.19E+00	9.77E−01	1.94E−01	2.04E−02	9.35E−03	5.68E−03	1.09E−03
95.00	1.03E+00	8.47E−01	1.73E−01	1.93E−02	8.52E−03	5.11E−03	9.71E−04
105.00	8.52E−01	6.98E−01	1.49E−01	1.81E−02	7.44E−03	4.39E−03	8.27E−04
120.00	7.57E−01	6.22E−01	1.38E−01	1.74E−02	6.62E−03	3.82E−03	7.15E−04
135.00	7.51E−01	6.17E−01	1.39E−01	1.72E−02	6.20E−03	3.52E−03	6.56E−04
150.00	7.71E−01	6.34E−01	1.44E−01	1.72E−02	5.96E−03	3.35E−03	6.22E−04
165.00	7.89E−01	6.50E−01	1.48E−01	1.72E−02	5.83E−03	3.25E−03	6.05E−04
180.00	7.96E−01	6.56E−01	1.49E−01	1.72E−02	5.79E−03	3.22E−03	6.00E−04
total	1.13E+02	9.36E+01	2.47E+01	5.60E+00	3.36E+00	2.60E+00	1.31E+00
rel ff	1.47E+02	1.11E+02	2.38E+01	5.66E+00	3.44E+00	2.69E+00	1.37E+00
nrl ff	1.53E+02	1.17E+02	2.55E+01	6.15E+00	3.75E+00	2.93E+00	1.50E+00

TABLE 1. Predicted *S*-matrix differential elastic scattering cross sections for photon energies (50.0, 59.54, 145.4, 316.5, 411.8, 468.1, 661.6, 778.9, 964.0, 1004.8, 1112.1, 1274.5, 1408.0 and 1500.0). The angle integrated total cross sections for each element and energies are presented. ''total'' represents total cross sections from this work, ''rel ff'' represents total cross sections calculated from the relativistic form factor and ''nrl ff'' represents total cross sections calculated from the nonrelativistic form factor—Continued[a]

θ (deg)	Photon energy (keV)						
	778.9	964.0	1004.8	1112.1	1274.5	1408.0	1500.0
Lutetium ($Z=71$)							
0.00	3.93E+02	3.92E+02	3.92E+02	3.92E+02	3.92E+02	3.92E+02	3.91E+02
0.01	3.92E+02	3.92E+02	3.92E+02	3.92E+02	3.91E+02	3.91E+02	3.91E+02
0.02	3.92E+02	3.91E+02	3.91E+02	3.91E+02	3.90E+02	3.89E+02	3.88E+02
0.04	3.89E+02	3.87E+02	3.87E+02	3.86E+02	3.84E+02	3.82E+02	3.81E+02
0.06	3.85E+02	3.82E+02	3.81E+02	3.79E+02	3.75E+02	3.71E+02	3.68E+02
0.10	3.75E+02	3.66E+02	3.64E+02	3.59E+02	3.51E+02	3.44E+02	3.40E+02
0.20	3.38E+02	3.19E+02	3.15E+02	3.05E+02	2.89E+02	2.77E+02	2.70E+02
0.30	3.00E+02	2.74E+02	2.69E+02	2.54E+02	2.34E+02	2.18E+02	2.08E+02
0.40	2.64E+02	2.33E+02	2.26E+02	2.10E+02	1.87E+02	1.70E+02	1.59E+02
0.50	2.32E+02	1.97E+02	1.90E+02	1.72E+02	1.49E+02	1.33E+02	1.23E+02
0.60	2.02E+02	1.66E+02	1.59E+02	1.41E+02	1.20E+02	1.05E+02	9.63E+01
0.70	1.76E+02	1.40E+02	1.33E+02	1.17E+02	9.66E+01	8.35E+01	7.59E+01
0.80	1.54E+02	1.19E+02	1.12E+02	9.70E+01	7.86E+01	6.69E+01	6.04E+01
1.00	1.17E+02	8.62E+01	8.07E+01	6.81E+01	5.33E+01	4.41E+01	3.90E+01
1.20	9.07E+01	6.38E+01	5.93E+01	4.91E+01	3.76E+01	3.08E+01	2.72E+01
1.50	6.27E+01	4.20E+01	3.88E+01	3.18E+01	2.46E+01	2.09E+01	1.93E+01
1.70	4.99E+01	3.29E+01	3.03E+01	2.49E+01	1.97E+01	1.74E+01	1.65E+01
2.00	3.66E+01	2.42E+01	2.23E+01	1.86E+01	1.50E+01	1.34E+01	1.28E+01
2.50	2.42E+01	1.67E+01	1.56E+01	1.30E+01	9.96E+00	7.75E+00	6.33E+00
3.00	1.77E+01	1.24E+01	1.16E+01	9.43E+00	6.43E+00	4.17E+00	2.83E+00
3.50	1.35E+01	9.02E+00	8.26E+00	6.44E+00	4.09E+00	2.50E+00	1.64E+00
4.00	1.03E+01	6.27E+00	5.62E+00	4.23E+00	2.70E+00	1.82E+00	1.35E+00
5.00	5.92E+00	3.04E+00	2.67E+00	1.98E+00	1.46E+00	1.38E+00	1.50E+00
6.00	3.48E+00	1.80E+00	1.60E+00	1.22E+00	9.78E−01	9.91E−01	1.13E+00
7.00	2.26E+00	1.33E+00	1.21E+00	9.58E−01	7.02E−01	5.46E−01	4.54E−01
8.00	1.63E+00	1.07E+00	9.84E−01	7.82E−01	4.94E−01	2.80E−01	1.63E−01
9.00	1.25E+00	8.33E−01	7.64E−01	5.90E−01	3.34E−01	1.60E−01	7.90E−02
10.00	9.93E−01	6.14E−01	5.52E−01	4.08E−01	2.22E−01	1.08E−01	5.60E−02
12.50	5.48E−01	2.58E−01	2.21E−01	1.50E−01	9.24E−02	6.91E−02	6.05E−02
15.00	2.92E−01	1.23E−01	1.04E−01	7.23E−02	5.28E−02	5.44E−02	6.69E−02
17.50	1.65E−01	7.55E−02	6.55E−02	4.81E−02	3.68E−02	3.64E−02	4.09E−02
20.00	1.04E−01	5.54E−02	4.96E−02	3.84E−02	2.74E−02	2.09E−02	1.70E−02
22.50	7.23E−02	4.38E−02	4.00E−02	3.15E−02	2.01E−02	1.16E−02	6.83E−03
25.00	5.43E−02	3.47E−02	3.17E−02	2.46E−02	1.41E−02	6.65E−03	3.19E−03
27.50	4.26E−02	2.66E−02	2.41E−02	1.80E−02	9.40E−03	4.02E−03	1.77E−03
30.00	3.40E−02	1.99E−02	1.77E−02	1.25E−02	6.10E−03	2.53E−03	1.13E−03
35.00	2.18E−02	1.06E−02	8.98E−03	5.65E−03	2.46E−03	1.05E−03	5.16E−04
40.00	1.37E−02	5.51E−03	4.48E−03	2.55E−03	1.03E−03	4.56E−04	2.50E−04
45.00	8.42E−03	2.92E−03	2.30E−03	1.22E−03	4.67E−04	2.15E−04	1.28E−04
50.00	5.16E−03	1.59E−03	1.23E−03	6.25E−04	2.35E−04	1.12E−04	7.08E−05
55.00	3.22E−03	9.23E−04	7.05E−04	3.54E−04	1.37E−04	7.11E−05	4.90E−05
60.00	2.08E−03	5.75E−04	4.39E−04	2.25E−04	9.42E−05	5.48E−05	4.22E−05
65.00	1.41E−03	3.88E−04	2.98E−04	1.58E−04	7.22E−05	4.70E−05	3.99E−05
70.00	1.01E−03	2.85E−04	2.22E−04	1.22E−04	6.10E−05	4.35E−05	3.98E−05
75.00	7.75E−04	2.26E−04	1.78E−04	1.02E−04	5.49E−05	4.17E−05	3.97E−05
80.00	6.26E−04	1.91E−04	1.53E−04	9.06E−05	5.14E−05	4.04E−05	3.90E−05
85.00	5.30E−04	1.69E−04	1.37E−04	8.38E−05	4.95E−05	3.96E−05	3.83E−05
90.00	4.66E−04	1.55E−04	1.27E−04	7.98E−05	4.87E−05	3.94E−05	3.78E−05
95.00	4.22E−04	1.45E−04	1.20E−04	7.71E−05	4.82E−05	3.93E−05	3.75E−05
105.00	3.67E−04	1.34E−04	1.12E−04	7.44E−05	4.86E−05	4.01E−05	3.80E−05
120.00	3.24E−04	1.25E−04	1.06E−04	7.34E−05	5.02E−05	4.23E−05	4.00E−05
135.00	3.03E−04	1.22E−04	1.05E−04	7.49E−05	5.29E−05	4.47E−05	4.17E−05
150.00	2.92E−04	1.22E−04	1.05E−04	7.65E−05	5.51E−05	4.67E−05	4.32E−05
165.00	2.86E−04	1.22E−04	1.06E−04	7.80E−05	5.69E−05	4.83E−05	4.44E−05
180.00	2.84E−04	1.22E−04	1.06E−04	7.86E−05	5.77E−05	4.89E−05	4.49E−05
total	9.44E−01	6.19E−01	5.70E−01	4.66E−01	3.51E−01	2.86E−01	2.56E−01
rel ff	9.98E−01	6.57E−01	6.05E−01	4.95E−01	3.77E−01	3.10E−01	2.74E−01
nrl ff	1.09E+00	7.19E−01	6.63E−01	5.42E−01	4.13E−01	3.40E−01	3.01E−01

TABLE 1. Predicted *S*-matrix differential elastic scattering cross sections for photon energies (50.0, 59.54, 145.4, 316.5, 411.8, 468.1, 661.6, 778.9, 964.0, 1004.8, 1112.1, 1274.5, 1408.0 and 1500.0). The angle integrated total cross sections for each element and energies are presented. ''total'' represents total cross sections from this work, ''rel ff'' represents total cross sections calculated from the relativistic form factor and ''nrl ff'' represents total cross sections calculated from the nonrelativistic form factor—Continued[a]

θ (deg)	Photon energy (keV)						
	50.0	59.5	145.4	316.5	411.8	468.1	661.6
Hafnium ($Z=72$)							
0.00	3.86E+02	3.89E+02	4.07E+02	4.05E+02	4.05E+02	4.04E+02	4.04E+02
0.01	3.86E+02	3.89E+02	4.07E+02	4.05E+02	4.04E+02	4.04E+02	4.03E+02
0.02	3.86E+02	3.90E+02	4.07E+02	4.05E+02	4.04E+02	4.04E+02	4.03E+02
0.04	3.86E+02	3.90E+02	4.07E+02	4.04E+02	4.04E+02	4.03E+02	4.01E+02
0.06	3.86E+02	3.90E+02	4.07E+02	4.04E+02	4.02E+02	4.02E+02	3.98E+02
0.10	3.86E+02	3.89E+02	4.06E+02	4.02E+02	3.99E+02	3.97E+02	3.90E+02
0.20	3.86E+02	3.89E+02	4.04E+02	3.92E+02	3.84E+02	3.79E+02	3.60E+02
0.30	3.85E+02	3.89E+02	4.01E+02	3.79E+02	3.65E+02	3.56E+02	3.27E+02
0.40	3.85E+02	3.88E+02	3.96E+02	3.64E+02	3.44E+02	3.33E+02	2.95E+02
0.50	3.84E+02	3.87E+02	3.91E+02	3.48E+02	3.24E+02	3.10E+02	2.64E+02
0.60	3.83E+02	3.85E+02	3.85E+02	3.32E+02	3.04E+02	2.87E+02	2.36E+02
0.70	3.82E+02	3.84E+02	3.78E+02	3.16E+02	2.84E+02	2.66E+02	2.11E+02
0.80	3.81E+02	3.82E+02	3.71E+02	3.01E+02	2.65E+02	2.46E+02	1.88E+02
1.00	3.79E+02	3.79E+02	3.56E+02	2.72E+02	2.31E+02	2.09E+02	1.49E+02
1.20	3.76E+02	3.74E+02	3.41E+02	2.44E+02	2.00E+02	1.78E+02	1.19E+02
1.50	3.70E+02	3.67E+02	3.20E+02	2.07E+02	1.61E+02	1.39E+02	8.60E+01
1.70	3.66E+02	3.61E+02	3.05E+02	1.85E+02	1.40E+02	1.19E+02	6.99E+01
2.00	3.59E+02	3.53E+02	2.85E+02	1.57E+02	1.13E+02	9.41E+01	5.21E+01
2.50	3.47E+02	3.38E+02	2.52E+02	1.20E+02	8.13E+01	6.54E+01	3.38E+01
3.00	3.34E+02	3.23E+02	2.23E+02	9.24E+01	5.94E+01	4.69E+01	2.41E+01
3.50	3.22E+02	3.08E+02	1.96E+02	7.20E+01	4.44E+01	3.50E+01	1.86E+01
4.00	3.10E+02	2.94E+02	1.72E+02	5.69E+01	3.42E+01	2.71E+01	1.49E+01
5.00	2.86E+02	2.66E+02	1.34E+02	3.75E+01	2.27E+01	1.80E+01	9.62E+00
6.00	2.63E+02	2.40E+02	1.05E+02	2.65E+01	1.68E+01	1.30E+01	5.90E+00
7.00	2.41E+02	2.16E+02	8.32E+01	2.00E+01	1.29E+01	9.62E+00	3.67E+00
8.00	2.21E+02	1.94E+02	6.64E+01	1.58E+01	9.76E+00	7.06E+00	2.48E+00
9.00	2.03E+02	1.73E+02	5.36E+01	1.27E+01	7.23E+00	5.14E+00	1.85E+00
10.00	1.86E+02	1.55E+02	4.38E+01	1.03E+01	5.31E+00	3.77E+00	1.49E+00
12.50	1.46E+02	1.18E+02	2.84E+01	6.04E+00	2.70E+00	1.95E+00	9.39E−01
15.00	1.12E+02	9.08E+01	2.06E+01	3.61E+00	1.72E+00	1.24E+00	5.54E−01
17.50	8.47E+01	7.02E+01	1.59E+01	2.31E+00	1.26E+00	8.95E−01	3.15E−01
20.00	6.51E+01	5.46E+01	1.25E+01	1.61E+00	9.42E−01	6.47E−01	1.87E−01
22.50	5.12E+01	4.29E+01	9.73E+00	1.21E+00	6.83E−01	4.55E−01	1.22E−01
25.00	4.12E+01	3.41E+01	7.44E+00	9.46E−01	4.82E−01	3.14E−01	8.68E−02
27.50	3.39E+01	2.75E+01	5.64E+00	7.48E−01	3.37E−01	2.18E−01	6.67E−02
30.00	2.85E+01	2.26E+01	4.30E+00	5.90E−01	2.39E−01	1.55E−01	5.35E−02
35.00	2.09E+01	1.61E+01	2.64E+00	3.60E−01	1.31E−01	8.66E−02	3.63E−02
40.00	1.59E+01	1.21E+01	1.81E+00	2.20E−01	8.21E−02	5.58E−02	2.48E−02
45.00	1.21E+01	9.31E+00	1.35E+00	1.39E−01	5.78E−02	3.99E−02	1.67E−02
50.00	9.22E+00	7.21E+00	1.06E+00	9.31E−02	4.35E−02	3.02E−02	1.11E−02
55.00	6.97E+00	5.54E+00	8.44E−01	6.62E−02	3.39E−02	2.34E−02	7.48E−03
60.00	5.25E+00	4.23E+00	6.71E−01	5.00E−02	2.69E−02	1.83E−02	5.11E−03
65.00	3.95E+00	3.21E+00	5.33E−01	3.97E−02	2.17E−02	1.45E−02	3.60E−03
70.00	3.00E+00	2.45E+00	4.25E−01	3.29E−02	1.78E−02	1.16E−02	2.64E−03
75.00	2.32E+00	1.90E+00	3.43E−01	2.83E−02	1.48E−02	9.50E−03	2.02E−03
80.00	1.83E+00	1.50E+00	2.82E−01	2.51E−02	1.27E−02	7.96E−03	1.63E−03
85.00	1.48E+00	1.22E+00	2.37E−01	2.28E−02	1.11E−02	6.85E−03	1.36E−03
90.00	1.24E+00	1.02E+00	2.06E−01	2.12E−02	9.89E−03	6.05E−03	1.18E−03
95.00	1.07E+00	8.82E−01	1.83E−01	2.01E−02	9.04E−03	5.47E−03	1.06E−03
105.00	8.79E−01	7.24E−01	1.58E−01	1.89E−02	7.93E−03	4.71E−03	9.04E−04
120.00	7.77E−01	6.41E−01	1.45E−01	1.83E−02	7.09E−03	4.12E−03	7.83E−04
135.00	7.68E−01	6.34E−01	1.46E−01	1.82E−02	6.67E−03	3.81E−03	7.19E−04
150.00	7.86E−01	6.50E−01	1.50E−01	1.82E−02	6.42E−03	3.63E−03	6.82E−04
165.00	8.04E−01	6.66E−01	1.55E−01	1.83E−02	6.29E−03	3.53E−03	6.63E−04
180.00	8.11E−01	6.72E−01	1.56E−01	1.83E−02	6.25E−03	3.50E−03	6.57E−04
total	1.17E+02	9.69E+01	2.56E+01	5.82E+00	3.49E+00	2.70E+00	1.36E+00
rel ff	1.53E+02	1.16E+02	2.47E+01	5.88E+00	3.57E+00	2.79E+00	1.43E+00
nrl ff	1.59E+02	1.21E+02	2.65E+01	6.39E+00	3.90E+00	3.05E+00	1.56E+00

TABLE 1. Predicted *S*-matrix differential elastic scattering cross sections for photon energies (50.0, 59.54, 145.4, 316.5, 411.8, 468.1, 661.6, 778.9, 964.0, 1004.8, 1112.1, 1274.5, 1408.0 and 1500.0). The angle integrated total cross sections for each element and energies are presented. ''total'' represents total cross sections from this work, ''rel ff'' represents total cross sections calculated from the relativistic form factor and ''nrl ff'' represents total cross sections calculated from the nonrelativistic form factor—Continued[a]

θ (deg)	Photon energy (keV)						
	778.9	964.0	1004.8	1112.1	1274.5	1408.0	1500.0
Hafnium ($Z=72$)							
0.00	4.04$E+02$	4.03$E+02$	4.03$E+02$	4.03$E+02$	4.03$E+02$	4.03$E+02$	4.02$E+02$
0.01	4.03$E+02$	4.03$E+02$	4.03$E+02$	4.03$E+02$	4.02$E+02$	4.02$E+02$	4.02$E+02$
0.02	4.03$E+02$	4.02$E+02$	4.02$E+02$	4.02$E+02$	4.01$E+02$	4.00$E+02$	3.99$E+02$
0.04	4.00$E+02$	3.98$E+02$	3.98$E+02$	3.97$E+02$	3.95$E+02$	3.93$E+02$	3.91$E+02$
0.06	3.96$E+02$	3.93$E+02$	3.92$E+02$	3.90$E+02$	3.85$E+02$	3.82$E+02$	3.79$E+02$
0.10	3.85$E+02$	3.77$E+02$	3.75$E+02$	3.70$E+02$	3.62$E+02$	3.55$E+02$	3.50$E+02$
0.20	3.48$E+02$	3.29$E+02$	3.25$E+02$	3.14$E+02$	2.98$E+02$	2.86$E+02$	2.78$E+02$
0.30	3.09$E+02$	2.83$E+02$	2.77$E+02$	2.63$E+02$	2.42$E+02$	2.25$E+02$	2.15$E+02$
0.40	2.73$E+02$	2.41$E+02$	2.34$E+02$	2.17$E+02$	1.93$E+02$	1.76$E+02$	1.64$E+02$
0.50	2.39$E+02$	2.03$E+02$	1.96$E+02$	1.78$E+02$	1.55$E+02$	1.37$E+02$	1.27$E+02$
0.60	2.09$E+02$	1.71$E+02$	1.64$E+02$	1.47$E+02$	1.24$E+02$	1.09$E+02$	9.99$E+01$
0.70	1.82$E+02$	1.45$E+02$	1.38$E+02$	1.21$E+02$	1.00$E+02$	8.67$E+01$	7.89$E+01$
0.80	1.59$E+02$	1.23$E+02$	1.16$E+02$	1.01$E+02$	8.17$E+01$	6.96$E+01$	6.28$E+01$
1.00	1.22$E+02$	8.95$E+01$	8.38$E+01$	7.08$E+01$	5.54$E+01$	4.59$E+01$	4.06$E+01$
1.20	9.41$E+01$	6.64$E+01$	6.16$E+01$	5.11$E+01$	3.91$E+01$	3.20$E+01$	2.81$E+01$
1.50	6.52$E+01$	4.37$E+01$	4.03$E+01$	3.30$E+01$	2.55$E+01$	2.15$E+01$	1.97$E+01$
1.70	5.19$E+01$	3.41$E+01$	3.14$E+01$	2.58$E+01$	2.04$E+01$	1.78$E+01$	1.69$E+01$
2.00	3.81$E+01$	2.50$E+01$	2.31$E+01$	1.92$E+01$	1.55$E+01$	1.38$E+01$	1.32$E+01$
2.50	2.50$E+01$	1.72$E+01$	1.60$E+01$	1.34$E+01$	1.03$E+01$	8.14$E+00$	6.77$E+00$
3.00	1.82$E+01$	1.28$E+01$	1.19$E+01$	9.75$E+00$	6.71$E+00$	4.41$E+00$	3.03$E+00$
3.50	1.39$E+01$	9.38$E+00$	8.60$E+00$	6.74$E+00$	4.29$E+00$	2.62$E+00$	1.70$E+00$
4.00	1.07$E+01$	6.57$E+00$	5.91$E+00$	4.46$E+00$	2.83$E+00$	1.87$E+00$	1.36$E+00$
5.00	6.19$E+00$	3.20$E+00$	2.81$E+00$	2.08$E+00$	1.52$E+00$	1.41$E+00$	1.50$E+00$
6.00	3.65$E+00$	1.87$E+00$	1.66$E+00$	1.27$E+00$	1.01$E+00$	1.03$E+00$	1.19$E+00$
7.00	2.36$E+00$	1.37$E+00$	1.24$E+00$	9.80$E-01$	7.27$E-01$	5.84$E-01$	5.04$E-01$
8.00	1.69$E+00$	1.10$E+00$	1.01$E+00$	8.05$E-01$	5.17$E-01$	3.01$E-01$	1.82$E-01$
9.00	1.30$E+00$	8.65$E-01$	7.94$E-01$	6.16$E-01$	3.52$E-01$	1.70$E-01$	8.50$E-02$
10.00	1.03$E+00$	6.44$E-01$	5.81$E-01$	4.31$E-01$	2.35$E-01$	1.13$E-01$	5.77$E-02$
12.50	5.74$E-01$	2.74$E-01$	2.35$E-01$	1.61$E-01$	9.72$E-02$	7.01$E-02$	5.90$E-02$
15.00	3.08$E-01$	1.30$E-01$	1.10$E-01$	7.57$E-02$	5.46$E-02$	5.54$E-02$	6.73$E-02$
17.50	1.74$E-01$	7.83$E-02$	6.77$E-02$	4.94$E-02$	3.77$E-02$	3.79$E-02$	4.35$E-02$
20.00	1.09$E-01$	5.69$E-02$	5.08$E-02$	3.90$E-02$	2.81$E-02$	2.21$E-02$	1.87$E-02$
22.50	7.51$E-02$	4.49$E-02$	4.09$E-02$	3.21$E-02$	2.08$E-02$	1.24$E-02$	7.57$E-03$
25.00	5.61$E-02$	3.56$E-02$	3.26$E-02$	2.54$E-02$	1.47$E-02$	7.11$E-03$	3.49$E-03$
27.50	4.39$E-02$	2.76$E-02$	2.50$E-02$	1.88$E-02$	9.93$E-03$	4.30$E-03$	1.92$E-03$
30.00	3.51$E-02$	2.08$E-02$	1.85$E-02$	1.32$E-02$	6.51$E-03$	2.72$E-03$	1.20$E-03$
35.00	2.26$E-02$	1.12$E-02$	9.54$E-03$	6.07$E-03$	2.67$E-03$	1.13$E-03$	5.49$E-04$
40.00	1.43$E-02$	5.89$E-03$	4.81$E-03$	2.77$E-03$	1.12$E-03$	4.97$E-04$	2.69$E-04$
45.00	8.89$E-03$	3.14$E-03$	2.48$E-03$	1.33$E-03$	5.15$E-04$	2.36$E-04$	1.39$E-04$
50.00	5.49$E-03$	1.73$E-03$	1.34$E-03$	6.86$E-04$	2.59$E-04$	1.24$E-04$	7.77$E-05$
55.00	3.45$E-03$	1.01$E-03$	7.70$E-04$	3.90$E-04$	1.52$E-04$	7.84$E-05$	5.38$E-05$
60.00	2.24$E-03$	6.29$E-04$	4.82$E-04$	2.48$E-04$	1.04$E-04$	6.02$E-05$	4.61$E-05$
65.00	1.53$E-03$	4.26$E-04$	3.28$E-04$	1.74$E-04$	7.95$E-05$	5.14$E-05$	4.34$E-05$
70.00	1.10$E-03$	3.13$E-04$	2.44$E-04$	1.34$E-04$	6.69$E-05$	4.74$E-05$	4.31$E-05$
75.00	8.46$E-04$	2.49$E-04$	1.96$E-04$	1.12$E-04$	6.01$E-05$	4.53$E-05$	4.29$E-05$
80.00	6.84$E-04$	2.10$E-04$	1.68$E-04$	9.95$E-05$	5.61$E-05$	4.38$E-05$	4.21$E-05$
85.00	5.80$E-04$	1.86$E-04$	1.50$E-04$	9.18$E-05$	5.40$E-05$	4.29$E-05$	4.12$E-05$
90.00	5.11$E-04$	1.70$E-04$	1.39$E-04$	8.73$E-05$	5.29$E-05$	4.25$E-05$	4.06$E-05$
95.00	4.63$E-04$	1.59$E-04$	1.31$E-04$	8.42$E-05$	5.23$E-05$	4.23$E-05$	4.02$E-05$
105.00	4.03$E-04$	1.46$E-04$	1.22$E-04$	8.10$E-05$	5.25$E-05$	4.30$E-05$	4.06$E-05$
120.00	3.56$E-04$	1.36$E-04$	1.15$E-04$	7.95$E-05$	5.39$E-05$	4.51$E-05$	4.26$E-05$
135.00	3.32$E-04$	1.33$E-04$	1.14$E-04$	8.08$E-05$	5.65$E-05$	4.75$E-05$	4.43$E-05$
150.00	3.19$E-04$	1.32$E-04$	1.14$E-04$	8.23$E-05$	5.88$E-05$	4.95$E-05$	4.58$E-05$
165.00	3.13$E-04$	1.32$E-04$	1.15$E-04$	8.37$E-05$	6.06$E-05$	5.12$E-05$	4.70$E-05$
180.00	3.11$E-04$	1.32$E-04$	1.15$E-04$	8.43$E-05$	6.13$E-05$	5.18$E-05$	4.75$E-05$
total	9.80$E-01$	6.42$E-01$	5.92$E-01$	4.84$E-01$	3.65$E-01$	2.97$E-01$	2.66$E-01$
rel ff	1.04$E+00$	6.83$E-01$	6.29$E-01$	5.14$E-01$	3.92$E-01$	3.22$E-01$	2.85$E-01$
nrl ff	1.14$E+00$	7.49$E-01$	6.90$E-01$	5.65$E-01$	4.30$E-01$	3.54$E-01$	3.13$E-01$

TABLE 1. Predicted *S*-matrix differential elastic scattering cross sections for photon energies (50.0, 59.54, 145.4, 316.5, 411.8, 468.1, 661.6, 778.9, 964.0, 1004.8, 1112.1, 1274.5, 1408.0 and 1500.0). The angle integrated total cross sections for each element and energies are presented. ''total'' represents total cross sections from this work, ''rel ff'' represents total cross sections calculated from the relativistic form factor and ''nrl ff'' represents total cross sections calculated from the nonrelativistic form factor—Continued[a]

θ (deg)	Photon energy (keV)						
	50.0	59.5	145.4	316.5	411.8	468.1	661.6
Tantalum ($Z=73$)							
0.00	3.97E+02	4.00E+02	4.18E+02	4.16E+02	4.16E+02	4.15E+02	4.15E+02
0.01	3.97E+02	4.00E+02	4.18E+02	4.16E+02	4.15E+02	4.15E+02	4.15E+02
0.02	3.97E+02	4.00E+02	4.18E+02	4.16E+02	4.15E+02	4.15E+02	4.14E+02
0.04	3.97E+02	4.00E+02	4.18E+02	4.16E+02	4.15E+02	4.14E+02	4.13E+02
0.06	3.97E+02	4.00E+02	4.18E+02	4.15E+02	4.14E+02	4.13E+02	4.10E+02
0.10	3.97E+02	4.00E+02	4.18E+02	4.13E+02	4.10E+02	4.08E+02	4.01E+02
0.20	3.97E+02	4.00E+02	4.15E+02	4.04E+02	3.95E+02	3.90E+02	3.70E+02
0.30	3.96E+02	3.99E+02	4.12E+02	3.90E+02	3.76E+02	3.67E+02	3.36E+02
0.40	3.96E+02	3.99E+02	4.07E+02	3.75E+02	3.54E+02	3.43E+02	3.04E+02
0.50	3.95E+02	3.97E+02	4.02E+02	3.58E+02	3.33E+02	3.19E+02	2.72E+02
0.60	3.94E+02	3.96E+02	3.96E+02	3.42E+02	3.13E+02	2.96E+02	2.44E+02
0.70	3.93E+02	3.95E+02	3.89E+02	3.26E+02	2.93E+02	2.74E+02	2.18E+02
0.80	3.92E+02	3.93E+02	3.82E+02	3.10E+02	2.74E+02	2.54E+02	1.94E+02
1.00	3.90E+02	3.89E+02	3.67E+02	2.80E+02	2.38E+02	2.16E+02	1.54E+02
1.20	3.87E+02	3.85E+02	3.51E+02	2.52E+02	2.06E+02	1.84E+02	1.23E+02
1.50	3.81E+02	3.77E+02	3.29E+02	2.14E+02	1.66E+02	1.44E+02	8.92E+01
1.70	3.77E+02	3.72E+02	3.15E+02	1.92E+02	1.44E+02	1.23E+02	7.27E+01
2.00	3.70E+02	3.63E+02	2.93E+02	1.62E+02	1.17E+02	9.76E+01	5.42E+01
2.50	3.57E+02	3.48E+02	2.60E+02	1.24E+02	8.44E+01	6.80E+01	3.51E+01
3.00	3.44E+02	3.33E+02	2.30E+02	9.58E+01	6.18E+01	4.88E+01	2.49E+01
3.50	3.32E+02	3.18E+02	2.02E+02	7.48E+01	4.62E+01	3.63E+01	1.91E+01
4.00	3.20E+02	3.03E+02	1.78E+02	5.92E+01	3.55E+01	2.81E+01	1.54E+01
5.00	2.95E+02	2.74E+02	1.39E+02	3.89E+01	2.35E+01	1.86E+01	9.98E+00
6.00	2.71E+02	2.48E+02	1.09E+02	2.75E+01	1.73E+01	1.34E+01	6.18E+00
7.00	2.49E+02	2.23E+02	8.63E+01	2.07E+01	1.33E+01	9.95E+00	3.85E+00
8.00	2.28E+02	2.00E+02	6.90E+01	1.62E+01	1.01E+01	7.34E+00	2.59E+00
9.00	2.09E+02	1.79E+02	5.57E+01	1.31E+01	7.55E+00	5.38E+00	1.92E+00
10.00	1.92E+02	1.61E+02	4.55E+01	1.06E+01	5.58E+00	3.96E+00	1.54E+00
12.50	1.51E+02	1.22E+02	2.94E+01	6.30E+00	2.82E+00	2.03E+00	9.73E−01
15.00	1.16E+02	9.42E+01	2.12E+01	3.78E+00	1.78E+00	1.29E+00	5.82E−01
17.50	8.84E+01	7.29E+01	1.63E+01	2.41E+00	1.30E+00	9.25E−01	3.33E−01
20.00	6.80E+01	5.69E+01	1.29E+01	1.67E+00	9.76E−01	6.72E−01	1.98E−01
22.50	5.34E+01	4.47E+01	1.01E+01	1.25E+00	7.13E−01	4.76E−01	1.28E−01
25.00	4.29E+01	3.55E+01	7.75E+00	9.80E−01	5.07E−01	3.31E−01	9.04E−02
27.50	3.52E+01	2.86E+01	5.90E+00	7.77E−01	3.56E−01	2.31E−01	6.90E−02
30.00	2.95E+01	2.35E+01	4.50E+00	6.15E−01	2.53E−01	1.64E−01	5.51E−02
35.00	2.16E+01	1.66E+01	2.76E+00	3.78E−01	1.38E−01	9.09E−02	3.74E−02
40.00	1.64E+01	1.24E+01	1.87E+00	2.32E−01	8.57E−02	5.80E−02	2.56E−02
45.00	1.25E+01	9.59E+00	1.39E+00	1.47E−01	5.98E−02	4.12E−02	1.74E−02
50.00	9.55E+00	7.44E+00	1.09E+00	9.80E−02	4.49E−02	3.11E−02	1.17E−02
55.00	7.24E+00	5.74E+00	8.71E−01	6.94E−02	3.49E−02	2.41E−02	7.90E−03
60.00	5.47E+00	4.40E+00	6.95E−01	5.21E−02	2.78E−02	1.89E−02	5.44E−03
65.00	4.14E+00	3.36E+00	5.55E−01	4.13E−02	2.25E−02	1.50E−02	3.85E−03
70.00	3.15E+00	2.57E+00	4.44E−01	3.41E−02	1.85E−02	1.21E−02	2.83E−03
75.00	2.43E+00	2.00E+00	3.60E−01	2.93E−02	1.55E−02	9.97E−03	2.18E−03
80.00	1.92E+00	1.58E+00	2.96E−01	2.60E−02	1.33E−02	8.40E−03	1.76E−03
85.00	1.56E+00	1.28E+00	2.50E−01	2.37E−02	1.16E−02	7.25E−03	1.48E−03
90.00	1.30E+00	1.07E+00	2.17E−01	2.20E−02	1.04E−02	6.43E−03	1.29E−03
95.00	1.12E+00	9.27E−01	1.94E−01	2.09E−02	9.56E−03	5.83E−03	1.15E−03
105.00	9.18E−01	7.58E−01	1.66E−01	1.97E−02	8.44E−03	5.05E−03	9.87E−04
120.00	8.07E−01	6.68E−01	1.53E−01	1.92E−02	7.59E−03	4.45E−03	8.56E−04
135.00	7.95E−01	6.58E−01	1.53E−01	1.92E−02	7.16E−03	4.12E−03	7.86E−04
150.00	8.12E−01	6.73E−01	1.58E−01	1.93E−02	6.91E−03	3.93E−03	7.47E−04
165.00	8.30E−01	6.89E−01	1.62E−01	1.93E−02	6.78E−03	3.83E−03	7.26E−04
180.00	8.37E−01	6.95E−01	1.63E−01	1.93E−02	6.73E−03	3.80E−03	7.19E−04
total	1.21E+02	1.00E+02	2.65E+01	6.04E+00	3.62E+00	2.80E+00	1.41E+00
rel ff	1.58E+02	1.20E+02	2.56E+01	6.10E+00	3.71E+00	2.90E+00	1.48E+00
nrl ff	1.65E+02	1.25E+02	2.76E+01	6.65E+00	4.06E+00	3.18E+00	1.63E+00

TABLE 1. Predicted *S*-matrix differential elastic scattering cross sections for photon energies (50.0, 59.54, 145.4, 316.5, 411.8, 468.1, 661.6, 778.9, 964.0, 1004.8, 1112.1, 1274.5, 1408.0 and 1500.0). The angle integrated total cross sections for each element and energies are presented. ''total'' represents total cross sections from this work, ''rel ff'' represents total cross sections calculated from the relativistic form factor and ''nrl ff'' represents total cross sections calculated from the nonrelativistic form factor—Continued[a]

θ (deg)	Photon energy (keV)						
	778.9	964.0	1004.8	1112.1	1274.5	1408.0	1500.0
Tantalum ($Z=73$)							
0.00	4.15E+02	4.15E+02	4.15E+02	4.14E+02	4.14E+02	4.14E+02	4.13E+02
0.01	4.14E+02	4.14E+02	4.14E+02	4.14E+02	4.13E+02	4.13E+02	4.13E+02
0.02	4.14E+02	4.13E+02	4.13E+02	4.13E+02	4.12E+02	4.11E+02	4.10E+02
0.04	4.11E+02	4.09E+02	4.09E+02	4.08E+02	4.06E+02	4.04E+02	4.02E+02
0.06	4.08E+02	4.04E+02	4.03E+02	4.00E+02	3.96E+02	3.92E+02	3.90E+02
0.10	3.96E+02	3.88E+02	3.86E+02	3.80E+02	3.72E+02	3.65E+02	3.60E+02
0.20	3.58E+02	3.39E+02	3.34E+02	3.23E+02	3.07E+02	2.95E+02	2.87E+02
0.30	3.19E+02	2.91E+02	2.86E+02	2.71E+02	2.49E+02	2.33E+02	2.22E+02
0.40	2.81E+02	2.48E+02	2.41E+02	2.24E+02	2.00E+02	1.82E+02	1.70E+02
0.50	2.47E+02	2.10E+02	2.03E+02	1.84E+02	1.60E+02	1.42E+02	1.31E+02
0.60	2.16E+02	1.77E+02	1.70E+02	1.52E+02	1.28E+02	1.13E+02	1.04E+02
0.70	1.88E+02	1.50E+02	1.43E+02	1.25E+02	1.04E+02	9.00E+01	8.20E+01
0.80	1.64E+02	1.27E+02	1.20E+02	1.04E+02	8.48E+01	7.24E+01	6.54E+01
1.00	1.26E+02	9.29E+01	8.70E+01	7.35E+01	5.77E+01	4.78E+01	4.22E+01
1.20	9.76E+01	6.90E+01	6.41E+01	5.32E+01	4.07E+01	3.32E+01	2.91E+01
1.50	6.78E+01	4.55E+01	4.20E+01	3.43E+01	2.64E+01	2.22E+01	2.01E+01
1.70	5.40E+01	3.55E+01	3.27E+01	2.68E+01	2.10E+01	1.83E+01	1.73E+01
2.00	3.96E+01	2.59E+01	2.39E+01	1.98E+01	1.59E+01	1.42E+01	1.37E+01
2.50	2.59E+01	1.77E+01	1.64E+01	1.37E+01	1.06E+01	8.54E+00	7.22E+00
3.00	1.88E+01	1.32E+01	1.23E+01	1.01E+01	7.00E+00	4.67E+00	3.26E+00
3.50	1.44E+01	9.73E+00	8.94E+00	7.04E+00	4.50E+00	2.74E+00	1.78E+00
4.00	1.11E+01	6.89E+00	6.21E+00	4.70E+00	2.98E+00	1.93E+00	1.37E+00
5.00	6.47E+00	3.37E+00	2.96E+00	2.19E+00	1.58E+00	1.43E+00	1.49E+00
6.00	3.82E+00	1.95E+00	1.72E+00	1.31E+00	1.04E+00	1.07E+00	1.25E+00
7.00	2.46E+00	1.41E+00	1.27E+00	1.00E+00	7.52E−01	6.23E−01	5.58E−01
8.00	1.76E+00	1.13E+00	1.04E+00	8.26E−01	5.39E−01	3.25E−01	2.03E−01
9.00	1.34E+00	8.95E−01	8.23E−01	6.40E−01	3.70E−01	1.82E−01	9.21E−02
10.00	1.07E+00	6.74E−01	6.10E−01	4.55E−01	2.49E−01	1.19E−01	5.99E−02
12.50	6.00E−01	2.91E−01	2.51E−01	1.72E−01	1.02E−01	7.12E−02	5.75E−02
15.00	3.25E−01	1.37E−01	1.16E−01	7.96E−02	5.66E−02	5.63E−02	6.72E−02
17.50	1.83E−01	8.14E−02	7.02E−02	5.07E−02	3.87E−02	3.93E−02	4.60E−02
20.00	1.14E−01	5.84E−02	5.19E−02	3.96E−02	2.88E−02	2.34E−02	2.06E−02
22.50	7.82E−02	4.59E−02	4.17E−02	3.27E−02	2.14E−02	1.32E−02	8.39E−03
25.00	5.80E−02	3.65E−02	3.34E−02	2.61E−02	1.53E−02	7.61E−03	3.84E−03
27.50	4.52E−02	2.85E−02	2.59E−02	1.95E−02	1.05E−02	4.60E−03	2.08E−03
30.00	3.61E−02	2.16E−02	1.93E−02	1.39E−02	6.94E−03	2.91E−03	1.29E−03
35.00	2.34E−02	1.18E−02	1.01E−02	6.50E−03	2.89E−03	1.22E−03	5.84E−04
40.00	1.49E−02	6.28E−03	5.15E−03	3.00E−03	1.23E−03	5.40E−04	2.89E−04
45.00	9.36E−03	3.38E−03	2.68E−03	1.45E−03	5.67E−04	2.59E−04	1.51E−04
50.00	5.83E−03	1.87E−03	1.45E−03	7.52E−04	2.86E−04	1.36E−04	8.51E−05
55.00	3.69E−03	1.09E−03	8.41E−04	4.28E−04	1.68E−04	8.64E−05	5.89E−05
60.00	2.42E−03	6.87E−04	5.27E−04	2.72E−04	1.15E−04	6.61E−05	5.04E−05
65.00	1.65E−03	4.66E−04	3.60E−04	1.91E−04	8.74E−05	5.63E−05	4.72E−05
70.00	1.20E−03	3.43E−04	2.68E−04	1.48E−04	7.34E−05	5.17E−05	4.67E−05
75.00	9.21E−04	2.73E−04	2.15E−04	1.23E−04	6.58E−05	4.93E−05	4.64E−05
80.00	7.47E−04	2.30E−04	1.84E−04	1.09E−04	6.13E−05	4.75E−05	4.54E−05
85.00	6.34E−04	2.04E−04	1.65E−04	1.01E−04	5.88E−05	4.64E−05	4.44E−05
90.00	5.59E−04	1.87E−04	1.52E−04	9.55E−05	5.75E−05	4.59E−05	4.37E−05
95.00	5.07E−04	1.75E−04	1.44E−04	9.19E−05	5.67E−05	4.56E−05	4.32E−05
105.00	4.42E−04	1.60E−04	1.33E−04	8.82E−05	5.67E−05	4.61E−05	4.34E−05
120.00	3.90E−04	1.49E−04	1.26E−04	8.62E−05	5.79E−05	4.81E−05	4.53E−05
135.00	3.64E−04	1.45E−04	1.24E−04	8.72E−05	6.05E−05	5.05E−05	4.70E−05
150.00	3.49E−04	1.44E−04	1.23E−04	8.86E−05	6.27E−05	5.26E−05	4.85E−05
165.00	3.42E−04	1.43E−04	1.24E−04	9.00E−05	6.45E−05	5.42E−05	4.98E−05
180.00	3.40E−04	1.44E−04	1.24E−04	9.06E−05	6.52E−05	5.49E−05	5.04E−05
total	1.02E+00	6.67E−01	6.14E−01	5.02E−01	3.79E−01	3.09E−01	2.76E−01
rel ff	1.08E+00	7.09E−01	6.54E−01	5.34E−01	4.07E−01	3.35E−01	2.96E−01
nrl ff	1.18E+00	7.80E−01	7.19E−01	5.88E−01	4.48E−01	3.69E−01	3.26E−01

TABLE 1. Predicted *S*-matrix differential elastic scattering cross sections for photon energies (50.0, 59.54, 145.4, 316.5, 411.8, 468.1, 661.6, 778.9, 964.0, 1004.8, 1112.1, 1274.5, 1408.0 and 1500.0). The angle integrated total cross sections for each element and energies are presented. ''total'' represents total cross sections from this work, ''rel ff'' represents total cross sections calculated from the relativistic form factor and ''nrl ff'' represents total cross sections calculated from the nonrelativistic form factor—Continued[a]

θ (deg)	Photon energy (keV)						
	50.0	59.5	145.4	316.5	411.8	468.1	661.6
Tungsten ($Z=74$)							
0.00	4.09E+02	4.13E+02	4.30E+02	4.28E+02	4.27E+02	4.27E+02	4.26E+02
0.01	4.09E+02	4.13E+02	4.30E+02	4.27E+02	4.27E+02	4.26E+02	4.26E+02
0.02	4.09E+02	4.13E+02	4.30E+02	4.27E+02	4.27E+02	4.26E+02	4.25E+02
0.04	4.09E+02	4.13E+02	4.29E+02	4.27E+02	4.26E+02	4.25E+02	4.24E+02
0.06	4.09E+02	4.13E+02	4.29E+02	4.26E+02	4.25E+02	4.24E+02	4.21E+02
0.10	4.09E+02	4.13E+02	4.29E+02	4.24E+02	4.21E+02	4.20E+02	4.12E+02
0.20	4.09E+02	4.12E+02	4.27E+02	4.15E+02	4.06E+02	4.01E+02	3.81E+02
0.30	4.09E+02	4.12E+02	4.24E+02	4.01E+02	3.87E+02	3.78E+02	3.46E+02
0.40	4.08E+02	4.11E+02	4.19E+02	3.86E+02	3.65E+02	3.53E+02	3.13E+02
0.50	4.07E+02	4.10E+02	4.13E+02	3.69E+02	3.43E+02	3.29E+02	2.81E+02
0.60	4.07E+02	4.09E+02	4.07E+02	3.52E+02	3.22E+02	3.05E+02	2.51E+02
0.70	4.06E+02	4.07E+02	4.00E+02	3.36E+02	3.02E+02	2.83E+02	2.24E+02
0.80	4.05E+02	4.05E+02	3.93E+02	3.19E+02	2.82E+02	2.61E+02	1.99E+02
1.00	4.02E+02	4.02E+02	3.78E+02	2.88E+02	2.45E+02	2.22E+02	1.59E+02
1.20	3.99E+02	3.97E+02	3.62E+02	2.59E+02	2.13E+02	1.89E+02	1.27E+02
1.50	3.93E+02	3.89E+02	3.39E+02	2.20E+02	1.71E+02	1.49E+02	9.27E+01
1.70	3.89E+02	3.84E+02	3.24E+02	1.97E+02	1.49E+02	1.27E+02	7.57E+01
2.00	3.82E+02	3.75E+02	3.02E+02	1.67E+02	1.21E+02	1.01E+02	5.67E+01
2.50	3.69E+02	3.60E+02	2.68E+02	1.28E+02	8.78E+01	7.08E+01	3.67E+01
3.00	3.56E+02	3.44E+02	2.36E+02	9.94E+01	6.45E+01	5.10E+01	2.58E+01
3.50	3.44E+02	3.28E+02	2.08E+02	7.79E+01	4.83E+01	3.79E+01	1.96E+01
4.00	3.31E+02	3.13E+02	1.83E+02	6.18E+01	3.72E+01	2.92E+01	1.57E+01
5.00	3.06E+02	2.84E+02	1.43E+02	4.07E+01	2.42E+01	1.91E+01	1.03E+01
6.00	2.81E+02	2.56E+02	1.13E+02	2.86E+01	1.77E+01	1.37E+01	6.50E+00
7.00	2.57E+02	2.30E+02	8.97E+01	2.13E+01	1.36E+01	1.02E+01	4.08E+00
8.00	2.35E+02	2.07E+02	7.20E+01	1.67E+01	1.05E+01	7.62E+00	2.72E+00
9.00	2.16E+02	1.86E+02	5.83E+01	1.34E+01	7.89E+00	5.63E+00	1.99E+00
10.00	1.98E+02	1.66E+02	4.77E+01	1.09E+01	5.88E+00	4.17E+00	1.58E+00
12.50	1.57E+02	1.27E+02	3.06E+01	6.57E+00	2.97E+00	2.14E+00	1.00E+00
15.00	1.22E+02	9.82E+01	2.18E+01	3.98E+00	1.84E+00	1.33E+00	6.11E−01
17.50	9.34E+01	7.64E+01	1.67E+01	2.53E+00	1.33E+00	9.49E−01	3.54E−01
20.00	7.22E+01	5.99E+01	1.32E+01	1.75E+00	1.00E+00	6.95E−01	2.10E−01
22.50	5.67E+01	4.72E+01	1.04E+01	1.30E+00	7.43E−01	4.98E−01	1.35E−01
25.00	4.55E+01	3.76E+01	8.07E+00	1.01E+00	5.34E−01	3.50E−01	9.42E−02
27.50	3.73E+01	3.03E+01	6.20E+00	8.02E−01	3.78E−01	2.45E−01	7.11E−02
30.00	3.11E+01	2.48E+01	4.75E+00	6.38E−01	2.69E−01	1.74E−01	5.65E−02
35.00	2.26E+01	1.74E+01	2.91E+00	3.97E−01	1.46E−01	9.58E−02	3.82E−02
40.00	1.70E+01	1.30E+01	1.95E+00	2.46E−01	8.96E−02	6.03E−02	2.64E−02
45.00	1.31E+01	9.96E+00	1.44E+00	1.56E−01	6.18E−02	4.23E−02	1.80E−02
50.00	1.00E+01	7.76E+00	1.12E+00	1.04E−01	4.60E−02	3.18E−02	1.22E−02
55.00	7.67E+00	6.03E+00	8.93E−01	7.29E−02	3.58E−02	2.47E−02	8.33E−03
60.00	5.85E+00	4.67E+00	7.17E−01	5.44E−02	2.85E−02	1.95E−02	5.77E−03
65.00	4.46E+00	3.60E+00	5.76E−01	4.28E−02	2.31E−02	1.56E−02	4.11E−03
70.00	3.43E+00	2.79E+00	4.64E−01	3.53E−02	1.91E−02	1.26E−02	3.04E−03
75.00	2.67E+00	2.18E+00	3.78E−01	3.03E−02	1.61E−02	1.04E−02	2.35E−03
80.00	2.12E+00	1.73E+00	3.13E−01	2.68E−02	1.39E−02	8.84E−03	1.90E−03
85.00	1.73E+00	1.41E+00	2.65E−01	2.44E−02	1.22E−02	7.68E−03	1.60E−03
90.00	1.45E+00	1.19E+00	2.30E−01	2.28E−02	1.10E−02	6.83E−03	1.40E−03
95.00	1.25E+00	1.03E+00	2.06E−01	2.17E−02	1.01E−02	6.22E−03	1.26E−03
105.00	1.02E+00	8.39E−01	1.77E−01	2.05E−02	8.98E−03	5.42E−03	1.08E−03
120.00	8.95E−01	7.35E−01	1.62E−01	2.01E−02	8.12E−03	4.79E−03	9.37E−04
135.00	8.78E−01	7.22E−01	1.62E−01	2.02E−02	7.69E−03	4.46E−03	8.61E−04
150.00	8.97E−01	7.38E−01	1.66E−01	2.03E−02	7.44E−03	4.26E−03	8.17E−04
165.00	9.17E−01	7.54E−01	1.70E−01	2.04E−02	7.30E−03	4.16E−03	7.95E−04
180.00	9.25E−01	7.61E−01	1.71E−01	2.05E−02	7.26E−03	4.12E−03	7.87E−04
total	1.28E+02	1.05E+02	2.75E+01	6.27E+00	3.76E+00	2.91E+00	1.47E+00
rel ff	1.64E+02	1.24E+02	2.65E+01	6.33E+00	3.85E+00	3.01E+00	1.54E+00
nrl ff	1.71E+02	1.30E+02	2.86E+01	6.91E+00	4.22E+00	3.30E+00	1.69E+00

TABLE 1. Predicted *S*-matrix differential elastic scattering cross sections for photon energies (50.0, 59.54, 145.4, 316.5, 411.8, 468.1, 661.6, 778.9, 964.0, 1004.8, 1112.1, 1274.5, 1408.0 and 1500.0). The angle integrated total cross sections for each element and energies are presented. ''total'' represents total cross sections from this work, ''rel ff'' represents total cross sections calculated from the relativistic form factor and ''nrl ff'' represents total cross sections calculated from the nonrelativistic form factor—Continued[a]

θ (deg)	Photon energy (keV)						
	778.9	964.0	1004.8	1112.1	1274.5	1408.0	1500.0
Tungsten ($Z=74$)							
0.00	4.26E+02	4.26E+02	4.26E+02	4.26E+02	4.25E+02	4.25E+02	4.25E+02
0.01	4.26E+02	4.25E+02	4.25E+02	4.25E+02	4.25E+02	4.24E+02	4.24E+02
0.02	4.25E+02	4.25E+02	4.25E+02	4.24E+02	4.23E+02	4.22E+02	4.21E+02
0.04	4.23E+02	4.21E+02	4.20E+02	4.19E+02	4.17E+02	4.15E+02	4.14E+02
0.06	4.19E+02	4.15E+02	4.14E+02	4.12E+02	4.07E+02	4.04E+02	4.01E+02
0.10	4.07E+02	3.99E+02	3.97E+02	3.91E+02	3.83E+02	3.76E+02	3.71E+02
0.20	3.69E+02	3.49E+02	3.45E+02	3.33E+02	3.17E+02	3.04E+02	2.95E+02
0.30	3.28E+02	3.00E+02	2.94E+02	2.79E+02	2.57E+02	2.39E+02	2.28E+02
0.40	2.90E+02	2.55E+02	2.48E+02	2.31E+02	2.06E+02	1.87E+02	1.75E+02
0.50	2.54E+02	2.16E+02	2.09E+02	1.90E+02	1.65E+02	1.47E+02	1.36E+02
0.60	2.22E+02	1.82E+02	1.75E+02	1.56E+02	1.32E+02	1.17E+02	1.07E+02
0.70	1.94E+02	1.54E+02	1.47E+02	1.29E+02	1.08E+02	9.35E+01	8.54E+01
0.80	1.69E+02	1.31E+02	1.24E+02	1.08E+02	8.81E+01	7.55E+01	6.84E+01
1.00	1.30E+02	9.64E+01	9.04E+01	7.66E+01	6.03E+01	5.00E+01	4.43E+01
1.20	1.01E+02	7.20E+01	6.70E+01	5.56E+01	4.26E+01	3.46E+01	3.02E+01
1.50	7.07E+01	4.77E+01	4.40E+01	3.60E+01	2.74E+01	2.27E+01	2.04E+01
1.70	5.65E+01	3.72E+01	3.42E+01	2.79E+01	2.17E+01	1.86E+01	1.73E+01
2.00	4.14E+01	2.69E+01	2.47E+01	2.04E+01	1.63E+01	1.45E+01	1.39E+01
2.50	2.68E+01	1.80E+01	1.67E+01	1.39E+01	1.09E+01	8.99E+00	7.85E+00
3.00	1.93E+01	1.34E+01	1.25E+01	1.03E+01	7.27E+00	5.01E+00	3.62E+00
3.50	1.47E+01	1.00E+01	9.24E+00	7.34E+00	4.75E+00	2.91E+00	1.89E+00
4.00	1.14E+01	7.23E+00	6.54E+00	5.00E+00	3.15E+00	1.99E+00	1.36E+00
5.00	6.76E+00	3.59E+00	3.16E+00	2.33E+00	1.65E+00	1.42E+00	1.40E+00
6.00	4.02E+00	2.04E+00	1.80E+00	1.36E+00	1.07E+00	1.10E+00	1.29E+00
7.00	2.58E+00	1.44E+00	1.29E+00	1.01E+00	7.71E−01	6.72E−01	6.37E−01
8.00	1.82E+00	1.15E+00	1.05E+00	8.33E−01	5.58E−01	3.57E−01	2.39E−01
9.00	1.39E+00	9.18E−01	8.43E−01	6.60E−01	3.89E−01	1.98E−01	1.04E−01
10.00	1.10E+00	7.03E−01	6.39E−01	4.81E−01	2.65E−01	1.26E−01	6.26E−02
12.50	6.26E−01	3.12E−01	2.70E−01	1.86E−01	1.08E−01	7.13E−02	5.39E−02
15.00	3.44E−01	1.46E−01	1.23E−01	8.42E−02	5.86E−02	5.64E−02	6.50E−02
17.50	1.94E−01	8.46E−02	7.26E−02	5.20E−02	3.94E−02	4.05E−02	4.84E−02
20.00	1.20E−01	5.97E−02	5.27E−02	3.98E−02	2.93E−02	2.48E−02	2.31E−02
22.50	8.13E−02	4.65E−02	4.21E−02	3.28E−02	2.19E−02	1.42E−02	9.55E−03
25.00	5.98E−02	3.71E−02	3.39E−02	2.65E−02	1.59E−02	8.19E−03	4.30E−03
27.50	4.64E−02	2.92E−02	2.66E−02	2.02E−02	1.10E−02	4.93E−03	2.26E−03
30.00	3.70E−02	2.24E−02	2.01E−02	1.46E−02	7.39E−03	3.10E−03	1.37E−03
35.00	2.41E−02	1.24E−02	1.07E−02	6.99E−03	3.13E−03	1.30E−03	6.12E−04
40.00	1.55E−02	6.69E−03	5.52E−03	3.26E−03	1.35E−03	5.85E−04	3.07E−04
45.00	9.83E−03	3.63E−03	2.90E−03	1.59E−03	6.24E−04	2.84E−04	1.63E−04
50.00	6.18E−03	2.02E−03	1.58E−03	8.23E−04	3.16E−04	1.50E−04	9.33E−05
55.00	3.95E−03	1.19E−03	9.17E−04	4.71E−04	1.85E−04	9.52E−05	6.47E−05
60.00	2.60E−03	7.50E−04	5.77E−04	2.99E−04	1.26E−04	7.27E−05	5.52E−05
65.00	1.79E−03	5.10E−04	3.94E−04	2.10E−04	9.61E−05	6.16E−05	5.15E−05
70.00	1.30E−03	3.76E−04	2.94E−04	1.62E−04	8.05E−05	5.64E−05	5.07E−05
75.00	1.00E−03	3.00E−04	2.37E−04	1.36E−04	7.20E−05	5.36E−05	5.03E−05
80.00	8.15E−04	2.53E−04	2.02E−04	1.20E−04	6.69E−05	5.16E−05	4.90E−05
85.00	6.93E−04	2.24E−04	1.81E−04	1.10E−04	6.40E−05	5.03E−05	4.79E−05
90.00	6.12E−04	2.05E−04	1.67E−04	1.04E−04	6.25E−05	4.95E−05	4.69E−05
95.00	5.55E−04	1.92E−04	1.57E−04	1.00E−04	6.15E−05	4.91E−05	4.63E−05
105.00	4.84E−04	1.75E−04	1.46E−04	9.61E−05	6.12E−05	4.94E−05	4.63E−05
120.00	4.28E−04	1.63E−04	1.37E−04	9.34E−05	6.22E−05	5.13E−05	4.80E−05
135.00	3.99E−04	1.58E−04	1.35E−04	9.42E−05	6.47E−05	5.37E−05	4.98E−05
150.00	3.82E−04	1.56E−04	1.34E−04	9.55E−05	6.69E−05	5.58E−05	5.14E−05
165.00	3.74E−04	1.56E−04	1.34E−04	9.68E−05	6.87E−05	5.75E−05	5.28E−05
180.00	3.72E−04	1.56E−04	1.34E−04	9.74E−05	6.95E−05	5.83E−05	5.34E−05
total	1.06E+00	6.92E−01	6.37E−01	5.21E−01	3.93E−01	3.20E−01	2.86E−01
rel ff	1.12E+00	7.37E−01	6.79E−01	5.55E−01	4.23E−01	3.48E−01	3.08E−01
nrl ff	1.23E+00	8.12E−01	7.49E−01	6.12E−01	4.67E−01	3.84E−01	3.40E−01

TABLE 1. Predicted *S*-matrix differential elastic scattering cross sections for photon energies (50.0, 59.54, 145.4, 316.5, 411.8, 468.1, 661.6, 778.9, 964.0, 1004.8, 1112.1, 1274.5, 1408.0 and 1500.0). The angle integrated total cross sections for each element and energies are presented. ''total'' represents total cross sections from this work, ''rel ff'' represents total cross sections calculated from the relativistic form factor and ''nrl ff'' represents total cross sections calculated from the nonrelativistic form factor—Continued[a]

θ (deg)	Photon energy (keV)						
	50.0	59.5	145.4	316.5	411.8	468.1	661.6
Rhenium ($Z=75$)							
0.00	4.22E+02	4.25E+02	4.41E+02	4.39E+02	4.38E+02	4.38E+02	4.38E+02
0.01	4.22E+02	4.25E+02	4.41E+02	4.39E+02	4.38E+02	4.38E+02	4.37E+02
0.02	4.22E+02	4.25E+02	4.41E+02	4.39E+02	4.38E+02	4.38E+02	4.37E+02
0.04	4.22E+02	4.25E+02	4.41E+02	4.38E+02	4.37E+02	4.37E+02	4.35E+02
0.06	4.22E+02	4.25E+02	4.41E+02	4.38E+02	4.36E+02	4.36E+02	4.32E+02
0.10	4.22E+02	4.25E+02	4.40E+02	4.36E+02	4.33E+02	4.31E+02	4.24E+02
0.20	4.22E+02	4.25E+02	4.38E+02	4.26E+02	4.18E+02	4.12E+02	3.92E+02
0.30	4.21E+02	4.24E+02	4.35E+02	4.13E+02	3.98E+02	3.89E+02	3.57E+02
0.40	4.21E+02	4.23E+02	4.30E+02	3.97E+02	3.76E+02	3.63E+02	3.22E+02
0.50	4.20E+02	4.22E+02	4.25E+02	3.80E+02	3.53E+02	3.38E+02	2.89E+02
0.60	4.19E+02	4.21E+02	4.18E+02	3.63E+02	3.32E+02	3.14E+02	2.58E+02
0.70	4.18E+02	4.19E+02	4.11E+02	3.46E+02	3.11E+02	2.91E+02	2.30E+02
0.80	4.17E+02	4.18E+02	4.04E+02	3.29E+02	2.90E+02	2.69E+02	2.05E+02
1.00	4.15E+02	4.14E+02	3.89E+02	2.97E+02	2.52E+02	2.29E+02	1.63E+02
1.20	4.11E+02	4.09E+02	3.73E+02	2.67E+02	2.19E+02	1.95E+02	1.31E+02
1.50	4.06E+02	4.02E+02	3.49E+02	2.27E+02	1.77E+02	1.53E+02	9.61E+01
1.70	4.01E+02	3.96E+02	3.34E+02	2.03E+02	1.54E+02	1.31E+02	7.89E+01
2.00	3.94E+02	3.87E+02	3.11E+02	1.73E+02	1.25E+02	1.05E+02	5.92E+01
2.50	3.81E+02	3.71E+02	2.76E+02	1.32E+02	9.11E+01	7.37E+01	3.83E+01
3.00	3.68E+02	3.55E+02	2.43E+02	1.03E+02	6.73E+01	5.32E+01	2.67E+01
3.50	3.55E+02	3.39E+02	2.14E+02	8.10E+01	5.06E+01	3.96E+01	2.01E+01
4.00	3.43E+02	3.24E+02	1.89E+02	6.45E+01	3.88E+01	3.04E+01	1.60E+01
5.00	3.16E+02	2.93E+02	1.47E+02	4.25E+01	2.50E+01	1.97E+01	1.06E+01
6.00	2.90E+02	2.65E+02	1.17E+02	2.97E+01	1.81E+01	1.41E+01	6.82E+00
7.00	2.65E+02	2.38E+02	9.31E+01	2.20E+01	1.39E+01	1.05E+01	4.30E+00
8.00	2.43E+02	2.14E+02	7.50E+01	1.71E+01	1.08E+01	7.89E+00	2.86E+00
9.00	2.22E+02	1.92E+02	6.08E+01	1.38E+01	8.23E+00	5.89E+00	2.07E+00
10.00	2.04E+02	1.72E+02	4.98E+01	1.12E+01	6.18E+00	4.39E+00	1.63E+00
12.50	1.62E+02	1.32E+02	3.19E+01	6.83E+00	3.13E+00	2.24E+00	1.03E+00
15.00	1.27E+02	1.02E+02	2.24E+01	4.17E+00	1.90E+00	1.38E+00	6.40E−01
17.50	9.84E+01	8.00E+01	1.70E+01	2.66E+00	1.36E+00	9.74E−01	3.76E−01
20.00	7.64E+01	6.29E+01	1.35E+01	1.82E+00	1.03E+00	7.18E−01	2.23E−01
22.50	6.01E+01	4.98E+01	1.07E+01	1.34E+00	7.73E−01	5.21E−01	1.42E−01
25.00	4.82E+01	3.98E+01	8.38E+00	1.04E+00	5.61E−01	3.69E−01	9.83E−02
27.50	3.94E+01	3.20E+01	6.49E+00	8.28E−01	4.01E−01	2.60E−01	7.35E−02
30.00	3.28E+01	2.62E+01	5.00E+00	6.61E−01	2.86E−01	1.85E−01	5.80E−02
35.00	2.36E+01	1.83E+01	3.06E+00	4.16E−01	1.54E−01	1.01E−01	3.91E−02
40.00	1.78E+01	1.35E+01	2.03E+00	2.59E−01	9.38E−02	6.27E−02	2.71E−02
45.00	1.36E+01	1.03E+01	1.48E+00	1.65E−01	6.39E−02	4.36E−02	1.87E−02
50.00	1.05E+01	8.08E+00	1.15E+00	1.09E−01	4.73E−02	3.26E−02	1.28E−02
55.00	8.10E+00	6.33E+00	9.15E−01	7.66E−02	3.67E−02	2.53E−02	8.78E−03
60.00	6.23E+00	4.94E+00	7.38E−01	5.69E−02	2.93E−02	2.00E−02	6.12E−03
65.00	4.80E+00	3.85E+00	5.97E−01	4.45E−02	2.38E−02	1.61E−02	4.38E−03
70.00	3.72E+00	3.00E+00	4.84E−01	3.65E−02	1.98E−02	1.31E−02	3.26E−03
75.00	2.91E+00	2.36E+00	3.96E−01	3.12E−02	1.67E−02	1.09E−02	2.53E−03
80.00	2.33E+00	1.89E+00	3.30E−01	2.77E−02	1.45E−02	9.30E−03	2.05E−03
85.00	1.90E+00	1.55E+00	2.80E−01	2.52E−02	1.28E−02	8.11E−03	1.73E−03
90.00	1.60E+00	1.30E+00	2.44E−01	2.36E−02	1.16E−02	7.25E−03	1.52E−03
95.00	1.38E+00	1.13E+00	2.18E−01	2.25E−02	1.07E−02	6.61E−03	1.37E−03
105.00	1.13E+00	9.24E−01	1.88E−01	2.13E−02	9.52E−03	5.80E−03	1.17E−03
120.00	9.88E−01	8.07E−01	1.71E−01	2.10E−02	8.66E−03	5.15E−03	1.02E−03
135.00	9.67E−01	7.91E−01	1.70E−01	2.12E−02	8.23E−03	4.81E−03	9.41E−04
150.00	9.87E−01	8.06E−01	1.74E−01	2.14E−02	7.99E−03	4.61E−03	8.94E−04
165.00	1.01E+00	8.24E−01	1.78E−01	2.16E−02	7.85E−03	4.50E−03	8.69E−04
180.00	1.02E+00	8.31E−01	1.80E−01	2.16E−02	7.81E−03	4.46E−03	8.61E−04
total	1.34E+02	1.10E+02	2.85E+01	6.50E+00	3.90E+00	3.02E+00	1.52E+00
rel ff	1.70E+02	1.28E+02	2.75E+01	6.56E+00	3.99E+00	3.12E+00	1.60E+00
nrl ff	1.78E+02	1.35E+02	2.97E+01	7.18E+00	4.39E+00	3.43E+00	1.76E+00

TABLE 1. Predicted *S*-matrix differential elastic scattering cross sections for photon energies (50.0, 59.54, 145.4, 316.5, 411.8, 468.1, 661.6, 778.9, 964.0, 1004.8, 1112.1, 1274.5, 1408.0 and 1500.0). The angle integrated total cross sections for each element and energies are presented. ''total'' represents total cross sections from this work, ''rel ff'' represents total cross sections calculated from the relativistic form factor and ''nrl ff'' represents total cross sections calculated from the nonrelativistic form factor—Continued[a]

θ (deg)	Photon energy (keV)						
	778.9	964.0	1004.8	1112.1	1274.5	1408.0	1500.0
Rhenium ($Z=75$)							
0.00	4.37E+02	4.37E+02	4.37E+02	4.37E+02	4.37E+02	4.36E+02	4.36E+02
0.01	4.37E+02	4.37E+02	4.37E+02	4.36E+02	4.36E+02	4.36E+02	4.35E+02
0.02	4.37E+02	4.36E+02	4.36E+02	4.35E+02	4.35E+02	4.34E+02	4.33E+02
0.04	4.34E+02	4.32E+02	4.32E+02	4.30E+02	4.28E+02	4.26E+02	4.25E+02
0.06	4.30E+02	4.26E+02	4.25E+02	4.23E+02	4.19E+02	4.15E+02	4.12E+02
0.10	4.19E+02	4.10E+02	4.08E+02	4.03E+02	3.94E+02	3.87E+02	3.82E+02
0.20	3.80E+02	3.59E+02	3.55E+02	3.43E+02	3.26E+02	3.13E+02	3.04E+02
0.30	3.38E+02	3.09E+02	3.03E+02	2.87E+02	2.64E+02	2.46E+02	2.35E+02
0.40	2.98E+02	2.63E+02	2.55E+02	2.37E+02	2.11E+02	1.92E+02	1.80E+02
0.50	2.61E+02	2.22E+02	2.14E+02	1.95E+02	1.69E+02	1.51E+02	1.40E+02
0.60	2.28E+02	1.88E+02	1.80E+02	1.61E+02	1.37E+02	1.21E+02	1.11E+02
0.70	1.99E+02	1.59E+02	1.52E+02	1.34E+02	1.11E+02	9.70E+01	8.89E+01
0.80	1.74E+02	1.36E+02	1.28E+02	1.12E+02	9.15E+01	7.86E+01	7.14E+01
1.00	1.34E+02	9.99E+01	9.38E+01	7.97E+01	6.29E+01	5.23E+01	4.63E+01
1.20	1.05E+02	7.50E+01	6.98E+01	5.82E+01	4.46E+01	3.61E+01	3.14E+01
1.50	7.37E+01	4.99E+01	4.60E+01	3.76E+01	2.85E+01	2.33E+01	2.07E+01
1.70	5.90E+01	3.89E+01	3.57E+01	2.91E+01	2.24E+01	1.89E+01	1.74E+01
2.00	4.32E+01	2.79E+01	2.57E+01	2.10E+01	1.66E+01	1.47E+01	1.41E+01
2.50	2.78E+01	1.84E+01	1.71E+01	1.42E+01	1.12E+01	9.43E+00	8.47E+00
3.00	1.98E+01	1.37E+01	1.27E+01	1.05E+01	7.55E+00	5.36E+00	4.00E+00
3.50	1.51E+01	1.03E+01	9.55E+00	7.63E+00	4.99E+00	3.09E+00	2.02E+00
4.00	1.17E+01	7.57E+00	6.88E+00	5.29E+00	3.33E+00	2.06E+00	1.37E+00
5.00	7.05E+00	3.81E+00	3.36E+00	2.48E+00	1.72E+00	1.42E+00	1.34E+00
6.00	4.23E+00	2.14E+00	1.88E+00	1.41E+00	1.10E+00	1.13E+00	1.32E+00
7.00	2.70E+00	1.47E+00	1.32E+00	1.03E+00	7.91E−01	7.19E−01	7.19E−01
8.00	1.89E+00	1.16E+00	1.06E+00	8.42E−01	5.77E−01	3.90E−01	2.78E−01
9.00	1.43E+00	9.41E−01	8.64E−01	6.78E−01	4.08E−01	2.15E−01	1.16E−01
10.00	1.13E+00	7.32E−01	6.67E−01	5.06E−01	2.81E−01	1.33E−01	6.60E−02
12.50	6.52E−01	3.34E−01	2.90E−01	2.00E−01	1.15E−01	7.18E−02	5.11E−02
15.00	3.63E−01	1.55E−01	1.31E−01	8.92E−02	6.07E−02	5.65E−02	6.29E−02
17.50	2.05E−01	8.82E−02	7.54E−02	5.34E−02	4.02E−02	4.17E−02	5.07E−02
20.00	1.26E−01	6.10E−02	5.36E−02	4.02E−02	2.97E−02	2.62E−02	2.56E−02
22.50	8.46E−02	4.72E−02	4.26E−02	3.30E−02	2.24E−02	1.52E−02	1.08E−02
25.00	6.18E−02	3.78E−02	3.45E−02	2.69E−02	1.64E−02	8.79E−03	4.81E−03
27.50	4.76E−02	2.99E−02	2.73E−02	2.09E−02	1.15E−02	5.27E−03	2.46E−03
30.00	3.79E−02	2.32E−02	2.09E−02	1.54E−02	7.85E−03	3.31E−03	1.46E−03
35.00	2.48E−02	1.31E−02	1.13E−02	7.48E−03	3.39E−03	1.40E−03	6.43E−04
40.00	1.61E−02	7.11E−03	5.90E−03	3.53E−03	1.47E−03	6.33E−04	3.25E−04
45.00	1.03E−02	3.89E−03	3.12E−03	1.73E−03	6.85E−04	3.10E−04	1.76E−04
50.00	6.54E−03	2.18E−03	1.71E−03	9.01E−04	3.48E−04	1.66E−04	1.02E−04
55.00	4.21E−03	1.29E−03	9.99E−04	5.16E−04	2.04E−04	1.05E−04	7.09E−05
60.00	2.79E−03	8.17E−04	6.30E−04	3.29E−04	1.39E−04	7.99E−05	6.05E−05
65.00	1.93E−03	5.58E−04	4.32E−04	2.31E−04	1.06E−04	6.74E−05	5.60E−05
70.00	1.41E−03	4.12E−04	3.22E−04	1.78E−04	8.83E−05	6.16E−05	5.50E−05
75.00	1.09E−03	3.28E−04	2.59E−04	1.49E−04	7.87E−05	5.83E−05	5.44E−05
80.00	8.88E−04	2.78E−04	2.22E−04	1.31E−04	7.30E−05	5.59E−05	5.29E−05
85.00	7.56E−04	2.45E−04	1.98E−04	1.21E−04	6.97E−05	5.44E−05	5.16E−05
90.00	6.69E−04	2.25E−04	1.83E−04	1.14E−04	6.79E−05	5.35E−05	5.04E−05
95.00	6.07E−04	2.10E−04	1.72E−04	1.10E−04	6.67E−05	5.29E−05	4.96E−05
105.00	5.30E−04	1.92E−04	1.59E−04	1.05E−04	6.60E−05	5.30E−05	4.94E−05
120.00	4.68E−04	1.78E−04	1.49E−04	1.01E−04	6.68E−05	5.47E−05	5.09E−05
135.00	4.36E−04	1.72E−04	1.46E−04	1.02E−04	6.92E−05	5.70E−05	5.27E−05
150.00	4.18E−04	1.70E−04	1.45E−04	1.03E−04	7.14E−05	5.92E−05	5.45E−05
165.00	4.09E−04	1.69E−04	1.45E−04	1.04E−04	7.33E−05	6.11E−05	5.60E−05
180.00	4.06E−04	1.69E−04	1.45E−04	1.05E−04	7.41E−05	6.18E−05	5.67E−05
total	1.09E+00	7.17E−01	6.61E−01	5.40E−01	4.08E−01	3.32E−01	2.96E−01
rel ff	1.16E+00	7.65E−01	7.05E−01	5.76E−01	4.39E−01	3.61E−01	3.20E−01
nrl ff	1.28E+00	8.45E−01	7.79E−01	6.37E−01	4.86E−01	4.00E−01	3.54E−01

TABLE 1. Predicted *S*-matrix differential elastic scattering cross sections for photon energies (50.0, 59.54, 145.4, 316.5, 411.8, 468.1, 661.6, 778.9, 964.0, 1004.8, 1112.1, 1274.5, 1408.0 and 1500.0). The angle integrated total cross sections for each element and energies are presented. ''total'' represents total cross sections from this work, ''rel ff'' represents total cross sections calculated from the relativistic form factor and ''nrl ff'' represents total cross sections calculated from the nonrelativistic form factor—Continued[a]

θ (deg)	Photon energy (keV)						
	50.0	59.5	145.4	316.5	411.8	468.1	661.6
Osmium ($Z=76$)							
0.00	4.35E+02	4.38E+02	4.53E+02	4.51E+02	4.50E+02	4.50E+02	4.49E+02
0.01	4.35E+02	4.38E+02	4.53E+02	4.50E+02	4.50E+02	4.49E+02	4.49E+02
0.02	4.35E+02	4.38E+02	4.53E+02	4.50E+02	4.50E+02	4.49E+02	4.48E+02
0.04	4.35E+02	4.38E+02	4.53E+02	4.50E+02	4.49E+02	4.49E+02	4.47E+02
0.06	4.35E+02	4.37E+02	4.52E+02	4.49E+02	4.48E+02	4.47E+02	4.44E+02
0.10	4.34E+02	4.37E+02	4.52E+02	4.47E+02	4.44E+02	4.43E+02	4.35E+02
0.20	4.34E+02	4.37E+02	4.50E+02	4.38E+02	4.29E+02	4.24E+02	4.03E+02
0.30	4.34E+02	4.37E+02	4.46E+02	4.24E+02	4.09E+02	4.00E+02	3.67E+02
0.40	4.33E+02	4.36E+02	4.42E+02	4.08E+02	3.86E+02	3.74E+02	3.31E+02
0.50	4.32E+02	4.34E+02	4.36E+02	3.91E+02	3.63E+02	3.48E+02	2.97E+02
0.60	4.32E+02	4.33E+02	4.30E+02	3.73E+02	3.41E+02	3.23E+02	2.65E+02
0.70	4.31E+02	4.32E+02	4.23E+02	3.55E+02	3.19E+02	2.99E+02	2.37E+02
0.80	4.30E+02	4.30E+02	4.15E+02	3.38E+02	2.98E+02	2.76E+02	2.11E+02
1.00	4.27E+02	4.26E+02	4.00E+02	3.05E+02	2.59E+02	2.35E+02	1.68E+02
1.20	4.24E+02	4.21E+02	3.83E+02	2.74E+02	2.25E+02	2.00E+02	1.35E+02
1.50	4.18E+02	4.14E+02	3.59E+02	2.33E+02	1.82E+02	1.58E+02	9.96E+01
1.70	4.13E+02	4.08E+02	3.43E+02	2.09E+02	1.58E+02	1.35E+02	8.20E+01
2.00	4.06E+02	3.99E+02	3.20E+02	1.78E+02	1.30E+02	1.09E+02	6.18E+01
2.50	3.94E+02	3.83E+02	2.83E+02	1.37E+02	9.45E+01	7.67E+01	4.00E+01
3.00	3.81E+02	3.67E+02	2.50E+02	1.07E+02	7.02E+01	5.55E+01	2.76E+01
3.50	3.67E+02	3.50E+02	2.20E+02	8.41E+01	5.28E+01	4.13E+01	2.06E+01
4.00	3.54E+02	3.34E+02	1.94E+02	6.71E+01	4.05E+01	3.16E+01	1.64E+01
5.00	3.27E+02	3.03E+02	1.52E+02	4.43E+01	2.58E+01	2.03E+01	1.10E+01
6.00	3.00E+02	2.73E+02	1.20E+02	3.08E+01	1.85E+01	1.44E+01	7.14E+00
7.00	2.74E+02	2.46E+02	9.65E+01	2.27E+01	1.42E+01	1.08E+01	4.54E+00
8.00	2.50E+02	2.21E+02	7.80E+01	1.76E+01	1.11E+01	8.17E+00	3.00E+00
9.00	2.29E+02	1.98E+02	6.34E+01	1.41E+01	8.56E+00	6.14E+00	2.15E+00
10.00	2.10E+02	1.78E+02	5.20E+01	1.16E+01	6.48E+00	4.60E+00	1.67E+00
12.50	1.68E+02	1.37E+02	3.31E+01	7.10E+00	3.29E+00	2.35E+00	1.06E+00
15.00	1.33E+02	1.06E+02	2.30E+01	4.37E+00	1.97E+00	1.42E+00	6.69E−01
17.50	1.03E+02	8.35E+01	1.74E+01	2.79E+00	1.40E+00	1.00E+00	3.97E−01
20.00	8.07E+01	6.60E+01	1.38E+01	1.90E+00	1.06E+00	7.41E−01	2.37E−01
22.50	6.36E+01	5.25E+01	1.10E+01	1.39E+00	8.02E−01	5.43E−01	1.50E−01
25.00	5.10E+01	4.19E+01	8.69E+00	1.08E+00	5.89E−01	3.88E−01	1.03E−01
27.50	4.16E+01	3.38E+01	6.78E+00	8.55E−01	4.23E−01	2.75E−01	7.60E−02
30.00	3.45E+01	2.76E+01	5.25E+00	6.85E−01	3.03E−01	1.96E−01	5.96E−02
35.00	2.47E+01	1.91E+01	3.21E+00	4.36E−01	1.63E−01	1.06E−01	4.00E−02
40.00	1.85E+01	1.40E+01	2.11E+00	2.74E−01	9.82E−02	6.54E−02	2.79E−02
45.00	1.42E+01	1.07E+01	1.52E+00	1.74E−01	6.62E−02	4.50E−02	1.94E−02
50.00	1.10E+01	8.41E+00	1.17E+00	1.15E−01	4.86E−02	3.34E−02	1.33E−02
55.00	8.53E+00	6.63E+00	9.37E−01	8.05E−02	3.76E−02	2.59E−02	9.22E−03
60.00	6.62E+00	5.22E+00	7.59E−01	5.94E−02	3.01E−02	2.06E−02	6.47E−03
65.00	5.14E+00	4.10E+00	6.17E−01	4.63E−02	2.45E−02	1.66E−02	4.66E−03
70.00	4.01E+00	3.22E+00	5.03E−01	3.79E−02	2.04E−02	1.36E−02	3.48E−03
75.00	3.17E+00	2.56E+00	4.14E−01	3.23E−02	1.74E−02	1.14E−02	2.72E−03
80.00	2.54E+00	2.06E+00	3.46E−01	2.86E−02	1.51E−02	9.76E−03	2.21E−03
85.00	2.09E+00	1.69E+00	2.95E−01	2.60E−02	1.34E−02	8.55E−03	1.87E−03
90.00	1.76E+00	1.43E+00	2.58E−01	2.44E−02	1.21E−02	7.67E−03	1.64E−03
95.00	1.53E+00	1.24E+00	2.31E−01	2.33E−02	1.12E−02	7.02E−03	1.48E−03
105.00	1.25E+00	1.01E+00	1.99E−01	2.22E−02	1.01E−02	6.18E−03	1.28E−03
120.00	1.09E+00	8.84E−01	1.81E−01	2.19E−02	9.23E−03	5.53E−03	1.11E−03
135.00	1.06E+00	8.63E−01	1.79E−01	2.22E−02	8.80E−03	5.18E−03	1.03E−03
150.00	1.08E+00	8.79E−01	1.83E−01	2.25E−02	8.56E−03	4.97E−03	9.76E−04
165.00	1.11E+00	8.98E−01	1.87E−01	2.27E−02	8.43E−03	4.86E−03	9.49E−04
180.00	1.12E+00	9.06E−01	1.88E−01	2.28E−02	8.38E−03	4.82E−03	9.40E−04
total	1.41E+02	1.16E+02	2.95E+01	6.74E+00	4.04E+00	3.13E+00	1.58E+00
rel ff	1.76E+02	1.33E+02	2.84E+01	6.80E+00	4.14E+00	3.24E+00	1.66E+00
nrl ff	1.84E+02	1.39E+02	3.08E+01	7.46E+00	4.56E+00	3.57E+00	1.83E+00

TABLE 1. Predicted *S*-matrix differential elastic scattering cross sections for photon energies (50.0, 59.54, 145.4, 316.5, 411.8, 468.1, 661.6, 778.9, 964.0, 1004.8, 1112.1, 1274.5, 1408.0 and 1500.0). The angle integrated total cross sections for each element and energies are presented. ''total'' represents total cross sections from this work, ''rel ff'' represents total cross sections calculated from the relativistic form factor and ''nrl ff'' represents total cross sections calculated from the nonrelativistic form factor—Continued[a]

θ (deg)	Photon energy (keV)						
	778.9	964.0	1004.8	1112.1	1274.5	1408.0	1500.0
Osmium ($Z=76$)							
0.00	4.49E+02	4.49E+02	4.49E+02	4.49E+02	4.48E+02	4.48E+02	4.48E+02
0.01	4.49E+02	4.48E+02	4.48E+02	4.48E+02	4.48E+02	4.47E+02	4.47E+02
0.02	4.48E+02	4.48E+02	4.47E+02	4.47E+02	4.46E+02	4.45E+02	4.44E+02
0.04	4.46E+02	4.44E+02	4.43E+02	4.42E+02	4.40E+02	4.38E+02	4.36E+02
0.06	4.42E+02	4.38E+02	4.37E+02	4.34E+02	4.30E+02	4.26E+02	4.23E+02
0.10	4.30E+02	4.21E+02	4.19E+02	4.14E+02	4.05E+02	3.98E+02	3.93E+02
0.20	3.90E+02	3.69E+02	3.65E+02	3.53E+02	3.35E+02	3.21E+02	3.13E+02
0.30	3.47E+02	3.18E+02	3.11E+02	2.95E+02	2.71E+02	2.53E+02	2.41E+02
0.40	3.06E+02	2.70E+02	2.63E+02	2.44E+02	2.17E+02	1.98E+02	1.86E+02
0.50	2.69E+02	2.28E+02	2.20E+02	2.01E+02	1.74E+02	1.56E+02	1.45E+02
0.60	2.35E+02	1.93E+02	1.85E+02	1.66E+02	1.41E+02	1.25E+02	1.15E+02
0.70	2.05E+02	1.64E+02	1.56E+02	1.38E+02	1.15E+02	1.01E+02	9.23E+01
0.80	1.79E+02	1.40E+02	1.32E+02	1.15E+02	9.48E+01	8.17E+01	7.44E+01
1.00	1.39E+02	1.03E+02	9.72E+01	8.28E+01	6.56E+01	5.47E+01	4.84E+01
1.20	1.09E+02	7.80E+01	7.27E+01	6.07E+01	4.66E+01	3.77E+01	3.26E+01
1.50	7.67E+01	5.22E+01	4.81E+01	3.93E+01	2.96E+01	2.40E+01	2.10E+01
1.70	6.15E+01	4.06E+01	3.73E+01	3.03E+01	2.31E+01	1.93E+01	1.75E+01
2.00	4.51E+01	2.90E+01	2.66E+01	2.17E+01	1.70E+01	1.50E+01	1.43E+01
2.50	2.89E+01	1.89E+01	1.74E+01	1.44E+01	1.14E+01	9.86E+00	9.08E+00
3.00	2.04E+01	1.39E+01	1.29E+01	1.07E+01	7.82E+00	5.72E+00	4.39E+00
3.50	1.54E+01	1.06E+01	9.84E+00	7.91E+00	5.24E+00	3.28E+00	2.16E+00
4.00	1.20E+01	7.90E+00	7.20E+00	5.58E+00	3.51E+00	2.13E+00	1.39E+00
5.00	7.35E+00	4.04E+00	3.57E+00	2.64E+00	1.80E+00	1.42E+00	1.28E+00
6.00	4.44E+00	2.24E+00	1.96E+00	1.47E+00	1.14E+00	1.15E+00	1.34E+00
7.00	2.83E+00	1.51E+00	1.35E+00	1.04E+00	8.13E−01	7.66E−01	8.00E−01
8.00	1.97E+00	1.18E+00	1.08E+00	8.51E−01	5.97E−01	4.25E−01	3.21E−01
9.00	1.48E+00	9.63E−01	8.85E−01	6.97E−01	4.28E−01	2.33E−01	1.31E−01
10.00	1.16E+00	7.61E−01	6.95E−01	5.31E−01	2.97E−01	1.42E−01	7.00E−02
12.50	6.78E−01	3.56E−01	3.10E−01	2.16E−01	1.22E−01	7.25E−02	4.89E−02
15.00	3.83E−01	1.65E−01	1.40E−01	9.45E−02	6.31E−02	5.67E−02	6.09E−02
17.50	2.17E−01	9.20E−02	7.84E−02	5.51E−02	4.11E−02	4.28E−02	5.26E−02
20.00	1.32E−01	6.26E−02	5.47E−02	4.06E−02	3.03E−02	2.76E−02	2.82E−02
22.50	8.82E−02	4.80E−02	4.31E−02	3.33E−02	2.29E−02	1.62E−02	1.22E−02
25.00	6.38E−02	3.84E−02	3.50E−02	2.73E−02	1.70E−02	9.42E−03	5.36E−03
27.50	4.90E−02	3.07E−02	2.80E−02	2.15E−02	1.21E−02	5.64E−03	2.68E−03
30.00	3.89E−02	2.40E−02	2.17E−02	1.60E−02	8.31E−03	3.53E−03	1.56E−03
35.00	2.55E−02	1.37E−02	1.19E−02	7.99E−03	3.65E−03	1.50E−03	6.77E−04
40.00	1.67E−02	7.55E−03	6.30E−03	3.81E−03	1.60E−03	6.84E−04	3.45E−04
45.00	1.08E−02	4.17E−03	3.36E−03	1.88E−03	7.52E−04	3.38E−04	1.90E−04
50.00	6.91E−03	2.35E−03	1.85E−03	9.83E−04	3.83E−04	1.82E−04	1.11E−04
55.00	4.48E−03	1.40E−03	1.09E−03	5.65E−04	2.25E−04	1.15E−04	7.75E−05
60.00	2.98E−03	8.89E−04	6.87E−04	3.60E−04	1.53E−04	8.78E−05	6.61E−05
65.00	2.08E−03	6.09E−04	4.72E−04	2.53E−04	1.16E−04	7.37E−05	6.09E−05
70.00	1.52E−03	4.51E−04	3.53E−04	1.96E−04	9.68E−05	6.71E−05	5.96E−05
75.00	1.18E−03	3.59E−04	2.84E−04	1.63E−04	8.61E−05	6.35E−05	5.89E−05
80.00	9.65E−04	3.04E−04	2.43E−04	1.44E−04	7.97E−05	6.06E−05	5.70E−05
85.00	8.23E−04	2.69E−04	2.17E−04	1.32E−04	7.59E−05	5.89E−05	5.56E−05
90.00	7.29E−04	2.46E−04	2.00E−04	1.25E−04	7.38E−05	5.77E−05	5.41E−05
95.00	6.63E−04	2.30E−04	1.89E−04	1.20E−04	7.23E−05	5.70E−05	5.32E−05
105.00	5.79E−04	2.10E−04	1.74E−04	1.14E−04	7.13E−05	5.68E−05	5.27E−05
120.00	5.12E−04	1.94E−04	1.63E−04	1.10E−04	7.18E−05	5.83E−05	5.41E−05
135.00	4.77E−04	1.87E−04	1.59E−04	1.10E−04	7.41E−05	6.07E−05	5.59E−05
150.00	4.57E−04	1.84E−04	1.57E−04	1.11E−04	7.63E−05	6.29E−05	5.77E−05
165.00	4.47E−04	1.83E−04	1.57E−04	1.12E−04	7.82E−05	6.48E−05	5.94E−05
180.00	4.44E−04	1.83E−04	1.57E−04	1.13E−04	7.90E−05	6.57E−05	6.02E−05
total	1.13E+00	7.44E−01	6.85E−01	5.60E−01	4.22E−01	3.44E−01	3.07E−01
rel ff	1.20E+00	7.93E−01	7.31E−01	5.98E−01	4.56E−01	3.75E−01	3.32E−01
nrl ff	1.33E+00	8.79E−01	8.10E−01	6.63E−01	5.05E−01	4.16E−01	3.68E−01

TABLE 1. Predicted *S*-matrix differential elastic scattering cross sections for photon energies (50.0, 59.54, 145.4, 316.5, 411.8, 468.1, 661.6, 778.9, 964.0, 1004.8, 1112.1, 1274.5, 1408.0 and 1500.0). The angle integrated total cross sections for each element and energies are presented. ''total'' represents total cross sections from this work, ''rel ff'' represents total cross sections calculated from the relativistic form factor and ''nrl ff'' represents total cross sections calculated from the nonrelativistic form factor—Continued[a]

θ (deg)	Photon energy (keV)						
	50.0	59.5	145.4	316.5	411.8	468.1	661.6
Iridium ($Z=77$)							
0.00	4.47E+02	4.50E+02	4.65E+02	4.62E+02	4.62E+02	4.62E+02	4.61E+02
0.01	4.47E+02	4.50E+02	4.64E+02	4.62E+02	4.62E+02	4.61E+02	4.61E+02
0.02	4.47E+02	4.50E+02	4.64E+02	4.62E+02	4.61E+02	4.61E+02	4.60E+02
0.04	4.47E+02	4.50E+02	4.64E+02	4.62E+02	4.61E+02	4.60E+02	4.58E+02
0.06	4.47E+02	4.50E+02	4.64E+02	4.61E+02	4.60E+02	4.59E+02	4.56E+02
0.10	4.47E+02	4.50E+02	4.64E+02	4.59E+02	4.56E+02	4.54E+02	4.47E+02
0.20	4.47E+02	4.50E+02	4.61E+02	4.49E+02	4.40E+02	4.35E+02	4.14E+02
0.30	4.47E+02	4.49E+02	4.58E+02	4.35E+02	4.20E+02	4.10E+02	3.77E+02
0.40	4.46E+02	4.48E+02	4.53E+02	4.19E+02	3.97E+02	3.84E+02	3.40E+02
0.50	4.45E+02	4.47E+02	4.47E+02	4.01E+02	3.73E+02	3.57E+02	3.05E+02
0.60	4.45E+02	4.46E+02	4.41E+02	3.83E+02	3.50E+02	3.32E+02	2.73E+02
0.70	4.44E+02	4.44E+02	4.34E+02	3.65E+02	3.28E+02	3.07E+02	2.43E+02
0.80	4.42E+02	4.43E+02	4.26E+02	3.48E+02	3.07E+02	2.84E+02	2.17E+02
1.00	4.40E+02	4.39E+02	4.10E+02	3.14E+02	2.66E+02	2.42E+02	1.73E+02
1.20	4.36E+02	4.34E+02	3.94E+02	2.82E+02	2.31E+02	2.06E+02	1.40E+02
1.50	4.30E+02	4.26E+02	3.69E+02	2.39E+02	1.87E+02	1.62E+02	1.03E+02
1.70	4.26E+02	4.20E+02	3.52E+02	2.15E+02	1.63E+02	1.40E+02	8.51E+01
2.00	4.19E+02	4.11E+02	3.28E+02	1.83E+02	1.34E+02	1.12E+02	6.44E+01
2.50	4.06E+02	3.95E+02	2.91E+02	1.41E+02	9.80E+01	7.97E+01	4.17E+01
3.00	3.93E+02	3.78E+02	2.56E+02	1.10E+02	7.30E+01	5.78E+01	2.86E+01
3.50	3.79E+02	3.61E+02	2.26E+02	8.73E+01	5.51E+01	4.30E+01	2.12E+01
4.00	3.65E+02	3.44E+02	1.99E+02	6.99E+01	4.22E+01	3.29E+01	1.68E+01
5.00	3.37E+02	3.12E+02	1.56E+02	4.61E+01	2.67E+01	2.09E+01	1.13E+01
6.00	3.09E+02	2.82E+02	1.24E+02	3.20E+01	1.90E+01	1.48E+01	7.45E+00
7.00	2.82E+02	2.53E+02	9.99E+01	2.35E+01	1.46E+01	1.11E+01	4.77E+00
8.00	2.57E+02	2.27E+02	8.10E+01	1.81E+01	1.15E+01	8.45E+00	3.15E+00
9.00	2.35E+02	2.04E+02	6.60E+01	1.45E+01	8.90E+00	6.40E+00	2.24E+00
10.00	2.16E+02	1.84E+02	5.42E+01	1.19E+01	6.79E+00	4.82E+00	1.72E+00
12.50	1.74E+02	1.42E+02	3.44E+01	7.37E+00	3.45E+00	2.47E+00	1.09E+00
15.00	1.38E+02	1.11E+02	2.37E+01	4.58E+00	2.04E+00	1.47E+00	6.98E−01
17.50	1.09E+02	8.71E+01	1.78E+01	2.92E+00	1.44E+00	1.03E+00	4.20E−01
20.00	8.50E+01	6.92E+01	1.41E+01	1.98E+00	1.09E+00	7.65E−01	2.51E−01
22.50	6.71E+01	5.51E+01	1.13E+01	1.44E+00	8.32E−01	5.65E−01	1.58E−01
25.00	5.38E+01	4.41E+01	8.99E+00	1.11E+00	6.16E−01	4.07E−01	1.07E−01
27.50	4.38E+01	3.56E+01	7.06E+00	8.83E−01	4.46E−01	2.90E−01	7.88E−02
30.00	3.63E+01	2.90E+01	5.49E+00	7.10E−01	3.21E−01	2.07E−01	6.13E−02
35.00	2.59E+01	2.00E+01	3.36E+00	4.56E−01	1.73E−01	1.12E−01	4.10E−02
40.00	1.93E+01	1.46E+01	2.20E+00	2.88E−01	1.03E−01	6.82E−02	2.87E−02
45.00	1.48E+01	1.11E+01	1.57E+00	1.84E−01	6.87E−02	4.64E−02	2.00E−02
50.00	1.15E+01	8.74E+00	1.20E+00	1.22E−01	5.01E−02	3.43E−02	1.39E−02
55.00	8.98E+00	6.93E+00	9.60E−01	8.46E−02	3.86E−02	2.66E−02	9.68E−03
60.00	7.02E+00	5.49E+00	7.79E−01	6.22E−02	3.09E−02	2.12E−02	6.83E−03
65.00	5.49E+00	4.35E+00	6.36E−01	4.82E−02	2.53E−02	1.71E−02	4.95E−03
70.00	4.32E+00	3.45E+00	5.22E−01	3.93E−02	2.11E−02	1.41E−02	3.72E−03
75.00	3.43E+00	2.75E+00	4.32E−01	3.34E−02	1.80E−02	1.19E−02	2.91E−03
80.00	2.77E+00	2.23E+00	3.63E−01	2.95E−02	1.57E−02	1.02E−02	2.38E−03
85.00	2.28E+00	1.84E+00	3.10E−01	2.69E−02	1.40E−02	8.99E−03	2.02E−03
90.00	1.93E+00	1.56E+00	2.71E−01	2.52E−02	1.27E−02	8.10E−03	1.78E−03
95.00	1.68E+00	1.35E+00	2.43E−01	2.41E−02	1.18E−02	7.44E−03	1.60E−03
105.00	1.37E+00	1.11E+00	2.10E−01	2.30E−02	1.07E−02	6.59E−03	1.39E−03
120.00	1.19E+00	9.65E−01	1.91E−01	2.29E−02	9.81E−03	5.92E−03	1.21E−03
135.00	1.16E+00	9.40E−01	1.89E−01	2.33E−02	9.39E−03	5.56E−03	1.12E−03
150.00	1.18E+00	9.55E−01	1.92E−01	2.37E−02	9.15E−03	5.35E−03	1.06E−03
165.00	1.21E+00	9.75E−01	1.96E−01	2.39E−02	9.02E−03	5.24E−03	1.03E−03
180.00	1.22E+00	9.84E−01	1.97E−01	2.40E−02	8.98E−03	5.20E−03	1.02E−03
total	1.48E+02	1.21E+02	3.05E+01	6.98E+00	4.19E+00	3.24E+00	1.63E+00
rel ff	1.82E+02	1.37E+02	2.94E+01	7.04E+00	4.29E+00	3.35E+00	1.72E+00
nrl ff	1.90E+02	1.44E+02	3.20E+01	7.74E+00	4.73E+00	3.71E+00	1.90E+00

TABLE 1. Predicted *S*-matrix differential elastic scattering cross sections for photon energies (50.0, 59.54, 145.4, 316.5, 411.8, 468.1, 661.6, 778.9, 964.0, 1004.8, 1112.1, 1274.5, 1408.0 and 1500.0). The angle integrated total cross sections for each element and energies are presented. ''total'' represents total cross sections from this work, ''rel ff'' represents total cross sections calculated from the relativistic form factor and ''nrl ff'' represents total cross sections calculated from the nonrelativistic form factor—Continued[a]

θ (deg)	Photon energy (keV)						
	778.9	964.0	1004.8	1112.1	1274.5	1408.0	1500.0
Iridium ($Z=77$)							
0.00	4.61E+02	4.60E+02	4.60E+02	4.60E+02	4.60E+02	4.60E+02	4.59E+02
0.01	4.60E+02	4.60E+02	4.60E+02	4.60E+02	4.59E+02	4.59E+02	4.59E+02
0.02	4.60E+02	4.59E+02	4.59E+02	4.59E+02	4.58E+02	4.57E+02	4.56E+02
0.04	4.57E+02	4.55E+02	4.55E+02	4.53E+02	4.51E+02	4.49E+02	4.48E+02
0.06	4.53E+02	4.49E+02	4.48E+02	4.46E+02	4.41E+02	4.37E+02	4.34E+02
0.10	4.42E+02	4.33E+02	4.30E+02	4.25E+02	4.16E+02	4.09E+02	4.04E+02
0.20	4.01E+02	3.80E+02	3.75E+02	3.62E+02	3.44E+02	3.30E+02	3.21E+02
0.30	3.57E+02	3.26E+02	3.20E+02	3.03E+02	2.79E+02	2.60E+02	2.48E+02
0.40	3.15E+02	2.77E+02	2.70E+02	2.50E+02	2.23E+02	2.04E+02	1.91E+02
0.50	2.76E+02	2.35E+02	2.26E+02	2.06E+02	1.79E+02	1.61E+02	1.49E+02
0.60	2.41E+02	1.99E+02	1.90E+02	1.70E+02	1.45E+02	1.29E+02	1.19E+02
0.70	2.11E+02	1.69E+02	1.61E+02	1.42E+02	1.19E+02	1.04E+02	9.58E+01
0.80	1.85E+02	1.44E+02	1.37E+02	1.19E+02	9.83E+01	8.49E+01	7.74E+01
1.00	1.43E+02	1.07E+02	1.01E+02	8.60E+01	6.83E+01	5.70E+01	5.05E+01
1.20	1.12E+02	8.11E+01	7.56E+01	6.33E+01	4.86E+01	3.92E+01	3.39E+01
1.50	7.97E+01	5.44E+01	5.03E+01	4.10E+01	3.08E+01	2.47E+01	2.14E+01
1.70	6.41E+01	4.24E+01	3.89E+01	3.15E+01	2.39E+01	1.97E+01	1.77E+01
2.00	4.70E+01	3.01E+01	2.76E+01	2.24E+01	1.75E+01	1.53E+01	1.45E+01
2.50	2.99E+01	1.93E+01	1.78E+01	1.47E+01	1.17E+01	1.03E+01	9.66E+00
3.00	2.10E+01	1.42E+01	1.32E+01	1.09E+01	8.09E+00	6.08E+00	4.80E+00
3.50	1.58E+01	1.09E+01	1.01E+01	8.19E+00	5.48E+00	3.48E+00	2.31E+00
4.00	1.24E+01	8.23E+00	7.53E+00	5.87E+00	3.69E+00	2.22E+00	1.42E+00
5.00	7.64E+00	4.27E+00	3.78E+00	2.80E+00	1.88E+00	1.43E+00	1.23E+00
6.00	4.65E+00	2.34E+00	2.05E+00	1.53E+00	1.17E+00	1.17E+00	1.35E+00
7.00	2.96E+00	1.55E+00	1.38E+00	1.06E+00	8.35E−01	8.11E−01	8.80E−01
8.00	2.04E+00	1.21E+00	1.09E+00	8.63E−01	6.16E−01	4.60E−01	3.67E−01
9.00	1.52E+00	9.86E−01	9.06E−01	7.14E−01	4.47E−01	2.52E−01	1.47E−01
10.00	1.20E+00	7.89E−01	7.22E−01	5.55E−01	3.14E−01	1.51E−01	7.47E−02
12.50	7.05E−01	3.78E−01	3.31E−01	2.32E−01	1.29E−01	7.36E−02	4.72E−02
15.00	4.02E−01	1.75E−01	1.48E−01	1.00E−01	6.57E−02	5.69E−02	5.90E−02
17.50	2.29E−01	9.62E−02	8.17E−02	5.69E−02	4.21E−02	4.39E−02	5.42E−02
20.00	1.39E−01	6.43E−02	5.60E−02	4.12E−02	3.08E−02	2.90E−02	3.07E−02
22.50	9.19E−02	4.89E−02	4.37E−02	3.35E−02	2.34E−02	1.73E−02	1.36E−02
25.00	6.60E−02	3.91E−02	3.56E−02	2.77E−02	1.75E−02	1.01E−02	5.97E−03
27.50	5.04E−02	3.14E−02	2.87E−02	2.21E−02	1.26E−02	6.02E−03	2.93E−03
30.00	3.99E−02	2.47E−02	2.24E−02	1.67E−02	8.77E−03	3.77E−03	1.67E−03
35.00	2.62E−02	1.44E−02	1.26E−02	8.50E−03	3.92E−03	1.60E−03	7.15E−04
40.00	1.73E−02	7.99E−03	6.70E−03	4.11E−03	1.74E−03	7.38E−04	3.67E−04
45.00	1.13E−02	4.45E−03	3.61E−03	2.04E−03	8.23E−04	3.68E−04	2.04E−04
50.00	7.28E−03	2.53E−03	2.00E−03	1.07E−03	4.21E−04	2.00E−04	1.21E−04
55.00	4.76E−03	1.51E−03	1.18E−03	6.19E−04	2.47E−04	1.27E−04	8.46E−05
60.00	3.19E−03	9.65E−04	7.49E−04	3.95E−04	1.68E−04	9.62E−05	7.21E−05
65.00	2.23E−03	6.63E−04	5.16E−04	2.78E−04	1.27E−04	8.06E−05	6.62E−05
70.00	1.64E−03	4.92E−04	3.86E−04	2.15E−04	1.06E−04	7.31E−05	6.46E−05
75.00	1.28E−03	3.93E−04	3.11E−04	1.79E−04	9.41E−05	6.90E−05	6.37E−05
80.00	1.05E−03	3.33E−04	2.66E−04	1.58E−04	8.70E−05	6.58E−05	6.15E−05
85.00	8.95E−04	2.94E−04	2.37E−04	1.44E−04	8.26E−05	6.38E−05	5.99E−05
90.00	7.94E−04	2.69E−04	2.19E−04	1.36E−04	8.02E−05	6.23E−05	5.82E−05
95.00	7.22E−04	2.51E−04	2.06E−04	1.30E−04	7.84E−05	6.14E−05	5.71E−05
105.00	6.32E−04	2.29E−04	1.90E−04	1.24E−04	7.70E−05	6.10E−05	5.63E−05
120.00	5.59E−04	2.11E−04	1.77E−04	1.19E−04	7.72E−05	6.22E−05	5.75E−05
135.00	5.21E−04	2.04E−04	1.73E−04	1.19E−04	7.93E−05	6.46E−05	5.93E−05
150.00	4.98E−04	2.00E−04	1.70E−04	1.19E−04	8.15E−05	6.68E−05	6.12E−05
165.00	4.87E−04	1.99E−04	1.70E−04	1.21E−04	8.34E−05	6.88E−05	6.30E−05
180.00	4.84E−04	1.99E−04	1.70E−04	1.21E−04	8.43E−05	6.97E−05	6.38E−05
total	1.18E+00	7.70E−01	7.10E−01	5.80E−01	4.38E−01	3.56E−01	3.18E−01
rel ff	1.25E+00	8.23E−01	7.58E−01	6.20E−01	4.73E−01	3.89E−01	3.44E−01
nrl ff	1.39E+00	9.14E−01	8.43E−01	6.89E−01	5.26E−01	4.33E−01	3.83E−01

TABLE 1. Predicted *S*-matrix differential elastic scattering cross sections for photon energies (50.0, 59.54, 145.4, 316.5, 411.8, 468.1, 661.6, 778.9, 964.0, 1004.8, 1112.1, 1274.5, 1408.0 and 1500.0). The angle integrated total cross sections for each element and energies are presented. ''total'' represents total cross sections from this work, ''rel ff'' represents total cross sections calculated from the relativistic form factor and ''nrl ff'' represents total cross sections calculated from the nonrelativistic form factor—Continued[a]

θ (deg)	Photon energy (keV)						
	50.0	59.5	145.4	316.5	411.8	468.1	661.6
Platinum ($Z=78$)							
0.00	4.60E+02	4.63E+02	4.76E+02	4.74E+02	4.74E+02	4.73E+02	4.73E+02
0.01	4.60E+02	4.63E+02	4.76E+02	4.74E+02	4.73E+02	4.73E+02	4.72E+02
0.02	4.60E+02	4.63E+02	4.76E+02	4.74E+02	4.73E+02	4.73E+02	4.72E+02
0.04	4.60E+02	4.63E+02	4.76E+02	4.74E+02	4.73E+02	4.72E+02	4.70E+02
0.06	4.60E+02	4.63E+02	4.76E+02	4.73E+02	4.72E+02	4.71E+02	4.67E+02
0.10	4.60E+02	4.63E+02	4.76E+02	4.71E+02	4.68E+02	4.66E+02	4.58E+02
0.20	4.60E+02	4.63E+02	4.73E+02	4.61E+02	4.52E+02	4.46E+02	4.25E+02
0.30	4.60E+02	4.62E+02	4.70E+02	4.47E+02	4.31E+02	4.21E+02	3.87E+02
0.40	4.59E+02	4.61E+02	4.65E+02	4.30E+02	4.08E+02	3.94E+02	3.49E+02
0.50	4.58E+02	4.60E+02	4.59E+02	4.12E+02	3.83E+02	3.67E+02	3.13E+02
0.60	4.58E+02	4.59E+02	4.52E+02	3.94E+02	3.60E+02	3.41E+02	2.80E+02
0.70	4.56E+02	4.57E+02	4.45E+02	3.75E+02	3.37E+02	3.16E+02	2.50E+02
0.80	4.55E+02	4.55E+02	4.37E+02	3.57E+02	3.15E+02	2.91E+02	2.23E+02
1.00	4.53E+02	4.51E+02	4.21E+02	3.22E+02	2.73E+02	2.48E+02	1.78E+02
1.20	4.49E+02	4.46E+02	4.04E+02	2.89E+02	2.37E+02	2.11E+02	1.44E+02
1.50	4.43E+02	4.38E+02	3.78E+02	2.46E+02	1.92E+02	1.67E+02	1.07E+02
1.70	4.38E+02	4.32E+02	3.62E+02	2.20E+02	1.68E+02	1.44E+02	8.83E+01
2.00	4.31E+02	4.23E+02	3.37E+02	1.88E+02	1.38E+02	1.16E+02	6.71E+01
2.50	4.18E+02	4.06E+02	2.98E+02	1.45E+02	1.01E+02	8.27E+01	4.34E+01
3.00	4.05E+02	3.89E+02	2.63E+02	1.14E+02	7.59E+01	6.02E+01	2.97E+01
3.50	3.91E+02	3.72E+02	2.32E+02	9.05E+01	5.74E+01	4.48E+01	2.18E+01
4.00	3.77E+02	3.54E+02	2.05E+02	7.26E+01	4.40E+01	3.41E+01	1.72E+01
5.00	3.48E+02	3.21E+02	1.61E+02	4.80E+01	2.76E+01	2.16E+01	1.16E+01
6.00	3.19E+02	2.90E+02	1.28E+02	3.33E+01	1.95E+01	1.52E+01	7.77E+00
7.00	2.90E+02	2.61E+02	1.03E+02	2.43E+01	1.49E+01	1.14E+01	5.01E+00
8.00	2.65E+02	2.34E+02	8.40E+01	1.87E+01	1.18E+01	8.72E+00	3.30E+00
9.00	2.42E+02	2.11E+02	6.87E+01	1.49E+01	9.23E+00	6.65E+00	2.33E+00
10.00	2.22E+02	1.89E+02	5.64E+01	1.22E+01	7.09E+00	5.04E+00	1.78E+00
12.50	1.80E+02	1.47E+02	3.57E+01	7.64E+00	3.62E+00	2.58E+00	1.12E+00
15.00	1.44E+02	1.15E+02	2.44E+01	4.78E+00	2.12E+00	1.53E+00	7.27E−01
17.50	1.14E+02	9.07E+01	1.82E+01	3.06E+00	1.48E+00	1.06E+00	4.42E−01
20.00	8.94E+01	7.23E+01	1.44E+01	2.06E+00	1.12E+00	7.89E−01	2.65E−01
22.50	7.07E+01	5.78E+01	1.16E+01	1.49E+00	8.62E−01	5.87E−01	1.66E−01
25.00	5.67E+01	4.64E+01	9.29E+00	1.15E+00	6.43E−01	4.27E−01	1.12E−01
27.50	4.61E+01	3.74E+01	7.33E+00	9.11E−01	4.69E−01	3.06E−01	8.17E−02
30.00	3.81E+01	3.05E+01	5.73E+00	7.35E−01	3.39E−01	2.19E−01	6.32E−02
35.00	2.71E+01	2.10E+01	3.52E+00	4.75E−01	1.82E−01	1.18E−01	4.21E−02
40.00	2.01E+01	1.52E+01	2.29E+00	3.03E−01	1.08E−01	7.12E−02	2.95E−02
45.00	1.54E+01	1.16E+01	1.62E+00	1.94E−01	7.13E−02	4.80E−02	2.07E−02
50.00	1.20E+01	9.09E+00	1.23E+00	1.28E−01	5.16E−02	3.52E−02	1.45E−02
55.00	9.43E+00	7.23E+00	9.82E−01	8.89E−02	3.97E−02	2.73E−02	1.01E−02
60.00	7.41E+00	5.76E+00	7.99E−01	6.50E−02	3.17E−02	2.17E−02	7.20E−03
65.00	5.84E+00	4.60E+00	6.55E−01	5.02E−02	2.60E−02	1.77E−02	5.25E−03
70.00	4.62E+00	3.67E+00	5.40E−01	4.07E−02	2.18E−02	1.46E−02	3.96E−03
75.00	3.70E+00	2.95E+00	4.49E−01	3.46E−02	1.86E−02	1.24E−02	3.12E−03
80.00	3.00E+00	2.40E+00	3.79E−01	3.05E−02	1.63E−02	1.07E−02	2.55E−03
85.00	2.48E+00	1.99E+00	3.25E−01	2.78E−02	1.46E−02	9.44E−03	2.17E−03
90.00	2.11E+00	1.69E+00	2.85E−01	2.60E−02	1.33E−02	8.53E−03	1.92E−03
95.00	1.83E+00	1.47E+00	2.56E−01	2.49E−02	1.24E−02	7.86E−03	1.73E−03
105.00	1.50E+00	1.21E+00	2.21E−01	2.39E−02	1.12E−02	7.00E−03	1.50E−03
120.00	1.30E+00	1.05E+00	2.01E−01	2.38E−02	1.04E−02	6.33E−03	1.32E−03
135.00	1.27E+00	1.02E+00	1.99E−01	2.43E−02	9.99E−03	5.96E−03	1.22E−03
150.00	1.29E+00	1.04E+00	2.02E−01	2.48E−02	9.77E−03	5.75E−03	1.16E−03
165.00	1.32E+00	1.06E+00	2.05E−01	2.51E−02	9.64E−03	5.63E−03	1.13E−03
180.00	1.33E+00	1.07E+00	2.07E−01	2.52E−02	9.59E−03	5.59E−03	1.12E−03
total	1.55E+02	1.26E+02	3.15E+01	7.23E+00	4.34E+00	3.36E+00	1.69E+00
rel ff	1.88E+02	1.42E+02	3.05E+01	7.29E+00	4.44E+00	3.47E+00	1.78E+00
nrl ff	1.97E+02	1.49E+02	3.32E+01	8.03E+00	4.92E+00	3.85E+00	1.98E+00

TABLE 1. Predicted *S*-matrix differential elastic scattering cross sections for photon energies (50.0, 59.54, 145.4, 316.5, 411.8, 468.1, 661.6, 778.9, 964.0, 1004.8, 1112.1, 1274.5, 1408.0 and 1500.0). The angle integrated total cross sections for each element and energies are presented. ''total'' represents total cross sections from this work, ''rel ff'' represents total cross sections calculated from the relativistic form factor and ''nrl ff'' represents total cross sections calculated from the nonrelativistic form factor—Continued[a]

θ (deg)	Photon energy (keV)						
	778.9	964.0	1004.8	1112.1	1274.5	1408.0	1500.0
Platinum ($Z=78$)							
0.00	4.73E+02	4.72E+02	4.72E+02	4.72E+02	4.72E+02	4.71E+02	4.71E+02
0.01	4.72E+02	4.72E+02	4.72E+02	4.71E+02	4.71E+02	4.71E+02	4.70E+02
0.02	4.72E+02	4.71E+02	4.71E+02	4.70E+02	4.70E+02	4.68E+02	4.68E+02
0.04	4.69E+02	4.67E+02	4.67E+02	4.65E+02	4.63E+02	4.61E+02	4.59E+02
0.06	4.65E+02	4.61E+02	4.60E+02	4.57E+02	4.53E+02	4.49E+02	4.46E+02
0.10	4.53E+02	4.44E+02	4.42E+02	4.36E+02	4.27E+02	4.20E+02	4.14E+02
0.20	4.12E+02	3.90E+02	3.85E+02	3.72E+02	3.54E+02	3.39E+02	3.30E+02
0.30	3.67E+02	3.35E+02	3.28E+02	3.11E+02	2.86E+02	2.67E+02	2.54E+02
0.40	3.23E+02	2.85E+02	2.77E+02	2.57E+02	2.29E+02	2.09E+02	1.96E+02
0.50	2.83E+02	2.41E+02	2.32E+02	2.12E+02	1.84E+02	1.65E+02	1.54E+02
0.60	2.48E+02	2.04E+02	1.96E+02	1.75E+02	1.50E+02	1.33E+02	1.23E+02
0.70	2.16E+02	1.73E+02	1.65E+02	1.46E+02	1.23E+02	1.08E+02	9.93E+01
0.80	1.90E+02	1.48E+02	1.41E+02	1.23E+02	1.02E+02	8.81E+01	8.04E+01
1.00	1.47E+02	1.11E+02	1.04E+02	8.92E+01	7.11E+01	5.94E+01	5.27E+01
1.20	1.16E+02	8.41E+01	7.86E+01	6.58E+01	5.06E+01	4.09E+01	3.52E+01
1.50	8.27E+01	5.67E+01	5.24E+01	4.28E+01	3.20E+01	2.55E+01	2.19E+01
1.70	6.67E+01	4.42E+01	4.06E+01	3.28E+01	2.47E+01	2.02E+01	1.79E+01
2.00	4.89E+01	3.13E+01	2.86E+01	2.32E+01	1.80E+01	1.56E+01	1.48E+01
2.50	3.10E+01	1.99E+01	1.83E+01	1.50E+01	1.20E+01	1.07E+01	1.02E+01
3.00	2.16E+01	1.45E+01	1.35E+01	1.11E+01	8.37E+00	6.44E+00	5.22E+00
3.50	1.62E+01	1.12E+01	1.04E+01	8.46E+00	5.73E+00	3.68E+00	2.47E+00
4.00	1.27E+01	8.55E+00	7.84E+00	6.15E+00	3.88E+00	2.31E+00	1.46E+00
5.00	7.94E+00	4.50E+00	4.00E+00	2.97E+00	1.96E+00	1.44E+00	1.19E+00
6.00	4.87E+00	2.45E+00	2.15E+00	1.59E+00	1.21E+00	1.20E+00	1.36E+00
7.00	3.09E+00	1.60E+00	1.42E+00	1.08E+00	8.58E−01	8.54E−01	9.57E−01
8.00	2.12E+00	1.23E+00	1.11E+00	8.75E−01	6.36E−01	4.97E−01	4.16E−01
9.00	1.57E+00	1.01E+00	9.26E−01	7.32E−01	4.66E−01	2.72E−01	1.65E−01
10.00	1.24E+00	8.16E−01	7.48E−01	5.79E−01	3.31E−01	1.60E−01	8.03E−02
12.50	7.31E−01	4.01E−01	3.52E−01	2.48E−01	1.36E−01	7.50E−02	4.59E−02
15.00	4.23E−01	1.86E−01	1.58E−01	1.06E−01	6.84E−02	5.72E−02	5.71E−02
17.50	2.42E−01	1.01E−01	8.53E−02	5.90E−02	4.33E−02	4.48E−02	5.54E−02
20.00	1.46E−01	6.63E−02	5.74E−02	4.19E−02	3.14E−02	3.03E−02	3.32E−02
22.50	9.60E−02	4.99E−02	4.44E−02	3.39E−02	2.39E−02	1.83E−02	1.51E−02
25.00	6.84E−02	3.99E−02	3.62E−02	2.81E−02	1.80E−02	1.07E−02	6.64E−03
27.50	5.19E−02	3.22E−02	2.93E−02	2.27E−02	1.31E−02	6.43E−03	3.21E−03
30.00	4.10E−02	2.55E−02	2.31E−02	1.74E−02	9.24E−03	4.02E−03	1.80E−03
35.00	2.70E−02	1.50E−02	1.32E−02	9.02E−03	4.21E−03	1.71E−03	7.56E−04
40.00	1.79E−02	8.45E−03	7.12E−03	4.42E−03	1.89E−03	7.95E−04	3.89E−04
45.00	1.18E−02	4.75E−03	3.86E−03	2.21E−03	9.00E−04	4.00E−04	2.19E−04
50.00	7.66E−03	2.72E−03	2.15E−03	1.17E−03	4.63E−04	2.19E−04	1.32E−04
55.00	5.04E−03	1.64E−03	1.28E−03	6.76E−04	2.72E−04	1.39E−04	9.21E−05
60.00	3.40E−03	1.05E−03	8.14E−04	4.32E−04	1.85E−04	1.05E−04	7.85E−05
65.00	2.39E−03	7.22E−04	5.63E−04	3.04E−04	1.40E−04	8.80E−05	7.19E−05
70.00	1.77E−03	5.37E−04	4.22E−04	2.35E−04	1.16E−04	7.96E−05	6.99E−05
75.00	1.38E−03	4.29E−04	3.40E−04	1.96E−04	1.03E−04	7.50E−05	6.88E−05
80.00	1.13E−03	3.63E−04	2.91E−04	1.72E−04	9.49E−05	7.13E−05	6.63E−05
85.00	9.72E−04	3.21E−04	2.59E−04	1.58E−04	8.99E−05	6.90E−05	6.46E−05
90.00	8.63E−04	2.94E−04	2.40E−04	1.49E−04	8.71E−05	6.73E−05	6.26E−05
95.00	7.86E−04	2.74E−04	2.25E−04	1.42E−04	8.50E−05	6.62E−05	6.13E−05
105.00	6.89E−04	2.50E−04	2.07E−04	1.35E−04	8.32E−05	6.54E−05	6.02E−05
120.00	6.10E−04	2.30E−04	1.93E−04	1.29E−04	8.30E−05	6.65E−05	6.11E−05
135.00	5.68E−04	2.21E−04	1.87E−04	1.28E−04	8.50E−05	6.87E−05	6.29E−05
150.00	5.43E−04	2.17E−04	1.85E−04	1.29E−04	8.71E−05	7.10E−05	6.49E−05
165.00	5.31E−04	2.15E−04	1.84E−04	1.30E−04	8.91E−05	7.31E−05	6.69E−05
180.00	5.27E−04	2.15E−04	1.84E−04	1.30E−04	9.00E−05	7.41E−05	6.77E−05
total	1.22E+00	7.98E−01	7.35E−01	6.01E−01	4.53E−01	3.69E−01	3.29E−01
rel ff	1.29E+00	8.53E−01	7.86E−01	6.43E−01	4.90E−01	4.04E−01	3.57E−01
nrl ff	1.44E+00	9.50E−01	8.76E−01	7.17E−01	5.47E−01	4.50E−01	3.98E−01

TABLE 1. Predicted *S*-matrix differential elastic scattering cross sections for photon energies (50.0, 59.54, 145.4, 316.5, 411.8, 468.1, 661.6, 778.9, 964.0, 1004.8, 1112.1, 1274.5, 1408.0 and 1500.0). The angle integrated total cross sections for each element and energies are presented. ''total'' represents total cross sections from this work, ''rel ff'' represents total cross sections calculated from the relativistic form factor and ''nrl ff'' represents total cross sections calculated from the nonrelativistic form factor—Continued[a]

θ (deg)	Photon energy (keV)						
	50.0	59.5	145.4	316.5	411.8	468.1	661.6
Gold ($Z=79$)							
0.00	4.73E+02	4.76E+02	4.88E+02	4.86E+02	4.86E+02	4.85E+02	4.85E+02
0.01	4.73E+02	4.76E+02	4.88E+02	4.86E+02	4.85E+02	4.85E+02	4.84E+02
0.02	4.73E+02	4.76E+02	4.88E+02	4.86E+02	4.85E+02	4.85E+02	4.84E+02
0.04	4.73E+02	4.76E+02	4.88E+02	4.86E+02	4.85E+02	4.84E+02	4.82E+02
0.06	4.73E+02	4.76E+02	4.88E+02	4.85E+02	4.84E+02	4.83E+02	4.79E+02
0.10	4.73E+02	4.76E+02	4.88E+02	4.83E+02	4.80E+02	4.78E+02	4.70E+02
0.20	4.73E+02	4.75E+02	4.85E+02	4.73E+02	4.64E+02	4.58E+02	4.36E+02
0.30	4.73E+02	4.75E+02	4.81E+02	4.58E+02	4.42E+02	4.32E+02	3.97E+02
0.40	4.72E+02	4.74E+02	4.77E+02	4.41E+02	4.18E+02	4.05E+02	3.58E+02
0.50	4.71E+02	4.73E+02	4.70E+02	4.23E+02	3.93E+02	3.77E+02	3.21E+02
0.60	4.71E+02	4.71E+02	4.64E+02	4.04E+02	3.69E+02	3.49E+02	2.87E+02
0.70	4.69E+02	4.70E+02	4.56E+02	3.85E+02	3.46E+02	3.24E+02	2.56E+02
0.80	4.68E+02	4.68E+02	4.48E+02	3.66E+02	3.23E+02	2.99E+02	2.28E+02
1.00	4.66E+02	4.64E+02	4.32E+02	3.30E+02	2.80E+02	2.54E+02	1.83E+02
1.20	4.62E+02	4.59E+02	4.14E+02	2.97E+02	2.43E+02	2.17E+02	1.48E+02
1.50	4.56E+02	4.50E+02	3.88E+02	2.52E+02	1.97E+02	1.72E+02	1.10E+02
1.70	4.51E+02	4.44E+02	3.71E+02	2.26E+02	1.72E+02	1.48E+02	9.15E+01
2.00	4.44E+02	4.35E+02	3.46E+02	1.93E+02	1.42E+02	1.20E+02	6.97E+01
2.50	4.31E+02	4.18E+02	3.06E+02	1.50E+02	1.05E+02	8.57E+01	4.52E+01
3.00	4.17E+02	4.00E+02	2.70E+02	1.18E+02	7.88E+01	6.26E+01	3.08E+01
3.50	4.02E+02	3.82E+02	2.38E+02	9.38E+01	5.98E+01	4.66E+01	2.25E+01
4.00	3.88E+02	3.65E+02	2.10E+02	7.54E+01	4.58E+01	3.55E+01	1.76E+01
5.00	3.58E+02	3.31E+02	1.65E+02	4.99E+01	2.86E+01	2.23E+01	1.20E+01
6.00	3.28E+02	2.98E+02	1.32E+02	3.45E+01	2.00E+01	1.56E+01	8.08E+00
7.00	2.99E+02	2.68E+02	1.07E+02	2.51E+01	1.53E+01	1.17E+01	5.25E+00
8.00	2.72E+02	2.41E+02	8.70E+01	1.92E+01	1.21E+01	9.00E+00	3.46E+00
9.00	2.49E+02	2.17E+02	7.13E+01	1.53E+01	9.55E+00	6.91E+00	2.42E+00
10.00	2.28E+02	1.95E+02	5.86E+01	1.26E+01	7.39E+00	5.26E+00	1.84E+00
12.50	1.85E+02	1.51E+02	3.71E+01	7.91E+00	3.80E+00	2.70E+00	1.15E+00
15.00	1.50E+02	1.19E+02	2.52E+01	4.99E+00	2.20E+00	1.58E+00	7.56E−01
17.50	1.19E+02	9.44E+01	1.87E+01	3.19E+00	1.52E+00	1.09E+00	4.65E−01
20.00	9.39E+01	7.55E+01	1.47E+01	2.15E+00	1.16E+00	8.13E−01	2.81E−01
22.50	7.44E+01	6.05E+01	1.19E+01	1.55E+00	8.91E−01	6.10E−01	1.75E−01
25.00	5.97E+01	4.87E+01	9.57E+00	1.18E+00	6.71E−01	4.47E−01	1.18E−01
27.50	4.85E+01	3.93E+01	7.60E+00	9.41E−01	4.93E−01	3.21E−01	8.49E−02
30.00	4.00E+01	3.20E+01	5.97E+00	7.60E−01	3.58E−01	2.31E−01	6.52E−02
35.00	2.83E+01	2.19E+01	3.67E+00	4.95E−01	1.93E−01	1.24E−01	4.31E−02
40.00	2.10E+01	1.58E+01	2.38E+00	3.18E−01	1.13E−01	7.43E−02	3.03E−02
45.00	1.60E+01	1.20E+01	1.67E+00	2.04E−01	7.41E−02	4.97E−02	2.14E−02
50.00	1.25E+01	9.44E+00	1.26E+00	1.35E−01	5.33E−02	3.63E−02	1.50E−02
55.00	9.88E+00	7.53E+00	1.00E+00	9.35E−02	4.08E−02	2.80E−02	1.06E−02
60.00	7.81E+00	6.04E+00	8.18E−01	6.81E−02	3.26E−02	2.23E−02	7.58E−03
65.00	6.20E+00	4.84E+00	6.74E−01	5.23E−02	2.67E−02	1.82E−02	5.55E−03
70.00	4.94E+00	3.89E+00	5.58E−01	4.23E−02	2.25E−02	1.52E−02	4.21E−03
75.00	3.97E+00	3.15E+00	4.66E−01	3.58E−02	1.93E−02	1.29E−02	3.33E−03
80.00	3.24E+00	2.58E+00	3.94E−01	3.15E−02	1.69E−02	1.12E−02	2.73E−03
85.00	2.69E+00	2.15E+00	3.40E−01	2.87E−02	1.52E−02	9.89E−03	2.34E−03
90.00	2.29E+00	1.83E+00	2.99E−01	2.69E−02	1.39E−02	8.97E−03	2.06E−03
95.00	2.00E+00	1.60E+00	2.69E−01	2.58E−02	1.30E−02	8.30E−03	1.87E−03
105.00	1.64E+00	1.31E+00	2.32E−01	2.48E−02	1.18E−02	7.42E−03	1.63E−03
120.00	1.42E+00	1.14E+00	2.11E−01	2.48E−02	1.10E−02	6.74E−03	1.43E−03
135.00	1.38E+00	1.11E+00	2.09E−01	2.54E−02	1.06E−02	6.38E−03	1.32E−03
150.00	1.40E+00	1.12E+00	2.12E−01	2.59E−02	1.04E−02	6.17E−03	1.26E−03
165.00	1.43E+00	1.14E+00	2.15E−01	2.63E−02	1.03E−02	6.05E−03	1.22E−03
180.00	1.44E+00	1.15E+00	2.17E−01	2.64E−02	1.02E−02	6.00E−03	1.21E−03
total	1.62E+02	1.32E+02	3.26E+01	7.48E+00	4.49E+00	3.48E+00	1.75E+00
rel ff	1.94E+02	1.47E+02	3.15E+01	7.54E+00	4.60E+00	3.60E+00	1.84E+00
nrl ff	2.04E+02	1.55E+02	3.44E+01	8.33E+00	5.10E+00	4.00E+00	2.05E+00

TABLE 1. Predicted *S*-matrix differential elastic scattering cross sections for photon energies (50.0, 59.54, 145.4, 316.5, 411.8, 468.1, 661.6, 778.9, 964.0, 1004.8, 1112.1, 1274.5, 1408.0 and 1500.0). The angle integrated total cross sections for each element and energies are presented. ''total'' represents total cross sections from this work, ''rel ff'' represents total cross sections calculated from the relativistic form factor and ''nrl ff'' represents total cross sections calculated from the nonrelativistic form factor—Continued[a]

θ (deg)	Photon energy (keV)						
	778.9	964.0	1004.8	1112.1	1274.5	1408.0	1500.0
Gold ($Z=79$)							
0.00	4.85E+02	4.84E+02	4.84E+02	4.84E+02	4.84E+02	4.83E+02	4.83E+02
0.01	4.84E+02	4.84E+02	4.83E+02	4.83E+02	4.83E+02	4.83E+02	4.82E+02
0.02	4.84E+02	4.83E+02	4.83E+02	4.82E+02	4.81E+02	4.80E+02	4.79E+02
0.04	4.81E+02	4.79E+02	4.78E+02	4.77E+02	4.75E+02	4.73E+02	4.71E+02
0.06	4.77E+02	4.73E+02	4.72E+02	4.69E+02	4.64E+02	4.60E+02	4.57E+02
0.10	4.65E+02	4.55E+02	4.53E+02	4.47E+02	4.38E+02	4.30E+02	4.25E+02
0.20	4.23E+02	4.00E+02	3.95E+02	3.82E+02	3.63E+02	3.48E+02	3.38E+02
0.30	3.76E+02	3.44E+02	3.37E+02	3.19E+02	2.93E+02	2.74E+02	2.61E+02
0.40	3.32E+02	2.92E+02	2.84E+02	2.63E+02	2.35E+02	2.15E+02	2.02E+02
0.50	2.91E+02	2.47E+02	2.38E+02	2.17E+02	1.89E+02	1.70E+02	1.59E+02
0.60	2.54E+02	2.09E+02	2.01E+02	1.80E+02	1.54E+02	1.37E+02	1.27E+02
0.70	2.22E+02	1.78E+02	1.70E+02	1.51E+02	1.27E+02	1.11E+02	1.03E+02
0.80	1.95E+02	1.53E+02	1.45E+02	1.27E+02	1.05E+02	9.12E+01	8.34E+01
1.00	1.52E+02	1.14E+02	1.08E+02	9.24E+01	7.38E+01	6.18E+01	5.49E+01
1.20	1.20E+02	8.72E+01	8.15E+01	6.85E+01	5.27E+01	4.25E+01	3.66E+01
1.50	8.58E+01	5.90E+01	5.46E+01	4.46E+01	3.32E+01	2.63E+01	2.25E+01
1.70	6.93E+01	4.60E+01	4.23E+01	3.42E+01	2.55E+01	2.07E+01	1.82E+01
2.00	5.09E+01	3.25E+01	2.97E+01	2.40E+01	1.85E+01	1.59E+01	1.50E+01
2.50	3.22E+01	2.04E+01	1.87E+01	1.54E+01	1.23E+01	1.11E+01	1.07E+01
3.00	2.23E+01	1.48E+01	1.37E+01	1.14E+01	8.64E+00	6.80E+00	5.65E+00
3.50	1.67E+01	1.15E+01	1.07E+01	8.72E+00	5.97E+00	3.90E+00	2.66E+00
4.00	1.31E+01	8.86E+00	8.15E+00	6.43E+00	4.07E+00	2.41E+00	1.51E+00
5.00	8.23E+00	4.74E+00	4.22E+00	3.14E+00	2.04E+00	1.46E+00	1.16E+00
6.00	5.09E+00	2.57E+00	2.25E+00	1.67E+00	1.25E+00	1.21E+00	1.36E+00
7.00	3.23E+00	1.65E+00	1.46E+00	1.11E+00	8.82E−01	8.96E−01	1.03E+00
8.00	2.21E+00	1.26E+00	1.13E+00	8.89E−01	6.57E−01	5.33E−01	4.68E−01
9.00	1.63E+00	1.03E+00	9.46E−01	7.48E−01	4.85E−01	2.93E−01	1.85E−01
10.00	1.27E+00	8.43E−01	7.73E−01	6.01E−01	3.48E−01	1.71E−01	8.69E−02
12.50	7.58E−01	4.24E−01	3.74E−01	2.65E−01	1.44E−01	7.67E−02	4.51E−02
15.00	4.43E−01	1.98E−01	1.68E−01	1.13E−01	7.14E−02	5.76E−02	5.53E−02
17.50	2.55E−01	1.06E−01	8.92E−02	6.14E−02	4.45E−02	4.57E−02	5.63E−02
20.00	1.53E−01	6.84E−02	5.90E−02	4.27E−02	3.21E−02	3.16E−02	3.56E−02
22.50	1.00E−01	5.10E−02	4.52E−02	3.43E−02	2.44E−02	1.94E−02	1.67E−02
25.00	7.10E−02	4.06E−02	3.68E−02	2.85E−02	1.85E−02	1.15E−02	7.36E−03
27.50	5.36E−02	3.29E−02	3.00E−02	2.32E−02	1.36E−02	6.86E−03	3.52E−03
30.00	4.22E−02	2.62E−02	2.38E−02	1.80E−02	9.70E−03	4.29E−03	1.94E−03
35.00	2.77E−02	1.57E−02	1.38E−02	9.54E−03	4.50E−03	1.83E−03	8.02E−04
40.00	1.85E−02	8.91E−03	7.55E−03	4.74E−03	2.05E−03	8.55E−04	4.13E−04
45.00	1.23E−02	5.05E−03	4.13E−03	2.40E−03	9.82E−04	4.35E−04	2.35E−04
50.00	8.04E−03	2.91E−03	2.32E−03	1.27E−03	5.07E−04	2.39E−04	1.43E−04
55.00	5.34E−03	1.76E−03	1.38E−03	7.38E−04	2.99E−04	1.52E−04	1.00E−04
60.00	3.62E−03	1.13E−03	8.85E−04	4.73E−04	2.03E−04	1.15E−04	8.53E−05
65.00	2.56E−03	7.84E−04	6.13E−04	3.33E−04	1.53E−04	9.61E−05	7.79E−05
70.00	1.90E−03	5.84E−04	4.60E−04	2.57E−04	1.27E−04	8.67E−05	7.56E−05
75.00	1.49E−03	4.67E−04	3.71E−04	2.14E−04	1.12E−04	8.15E−05	7.43E−05
80.00	1.23E−03	3.96E−04	3.18E−04	1.89E−04	1.03E−04	7.73E−05	7.15E−05
85.00	1.05E−03	3.50E−04	2.83E−04	1.72E−04	9.79E−05	7.47E−05	6.96E−05
90.00	9.37E−04	3.21E−04	2.62E−04	1.62E−04	9.46E−05	7.27E−05	6.73E−05
95.00	8.55E−04	2.99E−04	2.46E−04	1.55E−04	9.22E−05	7.13E−05	6.58E−05
105.00	7.50E−04	2.73E−04	2.26E−04	1.46E−04	8.99E−05	7.02E−05	6.43E−05
120.00	6.64E−04	2.50E−04	2.10E−04	1.40E−04	8.92E−05	7.10E−05	6.51E−05
135.00	6.18E−04	2.41E−04	2.03E−04	1.39E−04	9.11E−05	7.32E−05	6.68E−05
150.00	5.92E−04	2.35E−04	2.00E−04	1.39E−04	9.31E−05	7.55E−05	6.89E−05
165.00	5.78E−04	2.33E−04	1.99E−04	1.40E−04	9.51E−05	7.77E−05	7.09E−05
180.00	5.74E−04	2.33E−04	1.99E−04	1.40E−04	9.61E−05	7.87E−05	7.18E−05
total	1.26E+00	8.26E−01	7.61E−01	6.22E−01	4.69E−01	3.82E−01	3.41E−01
rel ff	1.34E+00	8.83E−01	8.14E−01	6.66E−01	5.08E−01	4.18E−01	3.70E−01
nrl ff	1.50E+00	9.87E−01	9.10E−01	7.45E−01	5.68E−01	4.68E−01	4.14E−01

TABLE 1. Predicted *S*-matrix differential elastic scattering cross sections for photon energies (50.0, 59.54, 145.4, 316.5, 411.8, 468.1, 661.6, 778.9, 964.0, 1004.8, 1112.1, 1274.5, 1408.0 and 1500.0). The angle integrated total cross sections for each element and energies are presented. ''total'' represents total cross sections from this work, ''rel ff'' represents total cross sections calculated from the relativistic form factor and ''nrl ff'' represents total cross sections calculated from the nonrelativistic form factor—Continued[a]

θ (deg)	Photon energy (keV)						
	50.0	59.5	145.4	316.5	411.8	468.1	661.6
Mercury ($Z=80$)							
0.00	4.87E+02	4.89E+02	5.00E+02	4.99E+02	4.98E+02	4.98E+02	4.97E+02
0.01	4.87E+02	4.89E+02	5.00E+02	4.98E+02	4.98E+02	4.97E+02	4.97E+02
0.02	4.87E+02	4.89E+02	5.00E+02	4.98E+02	4.97E+02	4.97E+02	4.96E+02
0.04	4.87E+02	4.89E+02	5.00E+02	4.98E+02	4.97E+02	4.96E+02	4.94E+02
0.06	4.86E+02	4.89E+02	5.00E+02	4.97E+02	4.96E+02	4.95E+02	4.91E+02
0.10	4.86E+02	4.89E+02	4.99E+02	4.95E+02	4.92E+02	4.90E+02	4.82E+02
0.20	4.86E+02	4.88E+02	4.97E+02	4.85E+02	4.75E+02	4.69E+02	4.48E+02
0.30	4.86E+02	4.88E+02	4.93E+02	4.70E+02	4.53E+02	4.43E+02	4.07E+02
0.40	4.85E+02	4.87E+02	4.88E+02	4.52E+02	4.29E+02	4.15E+02	3.67E+02
0.50	4.84E+02	4.85E+02	4.82E+02	4.34E+02	4.03E+02	3.86E+02	3.29E+02
0.60	4.84E+02	4.84E+02	4.75E+02	4.14E+02	3.79E+02	3.58E+02	2.94E+02
0.70	4.82E+02	4.83E+02	4.67E+02	3.95E+02	3.54E+02	3.32E+02	2.63E+02
0.80	4.81E+02	4.81E+02	4.59E+02	3.75E+02	3.31E+02	3.07E+02	2.34E+02
1.00	4.79E+02	4.77E+02	4.42E+02	3.39E+02	2.87E+02	2.61E+02	1.88E+02
1.20	4.75E+02	4.71E+02	4.25E+02	3.04E+02	2.49E+02	2.22E+02	1.52E+02
1.50	4.68E+02	4.63E+02	3.98E+02	2.59E+02	2.02E+02	1.77E+02	1.14E+02
1.70	4.64E+02	4.57E+02	3.80E+02	2.32E+02	1.77E+02	1.53E+02	9.47E+01
2.00	4.56E+02	4.47E+02	3.54E+02	1.98E+02	1.46E+02	1.24E+02	7.24E+01
2.50	4.43E+02	4.30E+02	3.13E+02	1.54E+02	1.08E+02	8.88E+01	4.70E+01
3.00	4.29E+02	4.11E+02	2.76E+02	1.22E+02	8.17E+01	6.50E+01	3.19E+01
3.50	4.14E+02	3.93E+02	2.44E+02	9.70E+01	6.21E+01	4.84E+01	2.32E+01
4.00	3.99E+02	3.75E+02	2.15E+02	7.81E+01	4.77E+01	3.68E+01	1.81E+01
5.00	3.69E+02	3.40E+02	1.70E+02	5.19E+01	2.96E+01	2.30E+01	1.23E+01
6.00	3.37E+02	3.07E+02	1.36E+02	3.58E+01	2.06E+01	1.60E+01	8.39E+00
7.00	3.07E+02	2.76E+02	1.10E+02	2.60E+01	1.57E+01	1.20E+01	5.50E+00
8.00	2.79E+02	2.48E+02	9.00E+01	1.98E+01	1.24E+01	9.28E+00	3.62E+00
9.00	2.55E+02	2.23E+02	7.39E+01	1.58E+01	9.87E+00	7.16E+00	2.52E+00
10.00	2.34E+02	2.01E+02	6.09E+01	1.29E+01	7.69E+00	5.48E+00	1.90E+00
12.50	1.91E+02	1.56E+02	3.85E+01	8.18E+00	3.98E+00	2.83E+00	1.18E+00
15.00	1.55E+02	1.23E+02	2.60E+01	5.19E+00	2.29E+00	1.65E+00	7.84E−01
17.50	1.24E+02	9.81E+01	1.91E+01	3.34E+00	1.56E+00	1.12E+00	4.89E−01
20.00	9.84E+01	7.86E+01	1.50E+01	2.24E+00	1.19E+00	8.38E−01	2.96E−01
22.50	7.81E+01	6.32E+01	1.22E+01	1.61E+00	9.20E−01	6.32E−01	1.85E−01
25.00	6.27E+01	5.10E+01	9.84E+00	1.22E+00	6.98E−01	4.66E−01	1.23E−01
27.50	5.10E+01	4.12E+01	7.86E+00	9.71E−01	5.17E−01	3.38E−01	8.84E−02
30.00	4.20E+01	3.36E+01	6.21E+00	7.85E−01	3.77E−01	2.43E−01	6.74E−02
35.00	2.96E+01	2.29E+01	3.83E+00	5.15E−01	2.04E−01	1.31E−01	4.43E−02
40.00	2.19E+01	1.65E+01	2.47E+00	3.33E−01	1.19E−01	7.77E−02	3.11E−02
45.00	1.67E+01	1.25E+01	1.72E+00	2.15E−01	7.72E−02	5.15E−02	2.20E−02
50.00	1.31E+01	9.80E+00	1.30E+00	1.42E−01	5.51E−02	3.73E−02	1.56E−02
55.00	1.03E+01	7.83E+00	1.03E+00	9.82E−02	4.20E−02	2.87E−02	1.11E−02
60.00	8.22E+00	6.31E+00	8.37E−01	7.13E−02	3.35E−02	2.29E−02	7.96E−03
65.00	6.55E+00	5.09E+00	6.91E−01	5.45E−02	2.75E−02	1.88E−02	5.87E−03
70.00	5.25E+00	4.12E+00	5.75E−01	4.40E−02	2.31E−02	1.57E−02	4.47E−03
75.00	4.25E+00	3.35E+00	4.82E−01	3.71E−02	1.99E−02	1.33E−02	3.55E−03
80.00	3.48E+00	2.76E+00	4.10E−01	3.26E−02	1.75E−02	1.16E−02	2.92E−03
85.00	2.91E+00	2.31E+00	3.54E−01	2.97E−02	1.58E−02	1.03E−02	2.51E−03
90.00	2.48E+00	1.97E+00	3.12E−01	2.78E−02	1.45E−02	9.42E−03	2.22E−03
95.00	2.17E+00	1.73E+00	2.82E−01	2.67E−02	1.36E−02	8.74E−03	2.01E−03
105.00	1.78E+00	1.42E+00	2.44E−01	2.56E−02	1.24E−02	7.86E−03	1.76E−03
120.00	1.55E+00	1.23E+00	2.22E−01	2.58E−02	1.16E−02	7.18E−03	1.55E−03
135.00	1.50E+00	1.19E+00	2.19E−01	2.65E−02	1.13E−02	6.81E−03	1.43E−03
150.00	1.52E+00	1.21E+00	2.22E−01	2.71E−02	1.11E−02	6.60E−03	1.37E−03
165.00	1.55E+00	1.23E+00	2.26E−01	2.75E−02	1.09E−02	6.48E−03	1.33E−03
180.00	1.56E+00	1.24E+00	2.27E−01	2.76E−02	1.09E−02	6.44E−03	1.32E−03
total	1.69E+02	1.37E+02	3.36E+01	7.74E+00	4.65E+00	3.60E+00	1.81E+00
rel ff	2.00E+02	1.51E+02	3.25E+01	7.80E+00	4.75E+00	3.72E+00	1.91E+00
nrl ff	2.11E+02	1.60E+02	3.56E+01	8.64E+00	5.29E+00	4.15E+00	2.13E+00

TABLE 1. Predicted *S*-matrix differential elastic scattering cross sections for photon energies (50.0, 59.54, 145.4, 316.5, 411.8, 468.1, 661.6, 778.9, 964.0, 1004.8, 1112.1, 1274.5, 1408.0 and 1500.0). The angle integrated total cross sections for each element and energies are presented. ''total'' represents total cross sections from this work, ''rel ff'' represents total cross sections calculated from the relativistic form factor and ''nrl ff'' represents total cross sections calculated from the nonrelativistic form factor—Continued[a]

θ (deg)	Photon energy (keV)						
	778.9	964.0	1004.8	1112.1	1274.5	1408.0	1500.0
Mercury ($Z=80$)							
0.00	4.97E+02	4.96E+02	4.96E+02	4.96E+02	4.96E+02	4.96E+02	4.95E+02
0.01	4.96E+02	4.96E+02	4.96E+02	4.95E+02	4.95E+02	4.95E+02	4.95E+02
0.02	4.96E+02	4.95E+02	4.95E+02	4.94E+02	4.94E+02	4.92E+02	4.91E+02
0.04	4.93E+02	4.91E+02	4.90E+02	4.89E+02	4.87E+02	4.84E+02	4.83E+02
0.06	4.89E+02	4.85E+02	4.84E+02	4.81E+02	4.76E+02	4.72E+02	4.69E+02
0.10	4.76E+02	4.67E+02	4.64E+02	4.59E+02	4.49E+02	4.41E+02	4.36E+02
0.20	4.33E+02	4.10E+02	4.05E+02	3.91E+02	3.72E+02	3.57E+02	3.47E+02
0.30	3.86E+02	3.52E+02	3.45E+02	3.27E+02	3.01E+02	2.80E+02	2.67E+02
0.40	3.40E+02	2.99E+02	2.91E+02	2.70E+02	2.41E+02	2.20E+02	2.07E+02
0.50	2.98E+02	2.53E+02	2.44E+02	2.23E+02	1.94E+02	1.75E+02	1.63E+02
0.60	2.60E+02	2.15E+02	2.06E+02	1.85E+02	1.58E+02	1.41E+02	1.31E+02
0.70	2.28E+02	1.83E+02	1.75E+02	1.55E+02	1.31E+02	1.15E+02	1.06E+02
0.80	2.00E+02	1.57E+02	1.49E+02	1.31E+02	1.09E+02	9.44E+01	8.64E+01
1.00	1.56E+02	1.18E+02	1.11E+02	9.56E+01	7.66E+01	6.42E+01	5.70E+01
1.20	1.24E+02	9.03E+01	8.45E+01	7.11E+01	5.48E+01	4.42E+01	3.80E+01
1.50	8.89E+01	6.14E+01	5.68E+01	4.64E+01	3.45E+01	2.72E+01	2.31E+01
1.70	7.19E+01	4.79E+01	4.40E+01	3.55E+01	2.64E+01	2.12E+01	1.85E+01
2.00	5.29E+01	3.38E+01	3.09E+01	2.48E+01	1.90E+01	1.63E+01	1.52E+01
2.50	3.34E+01	2.10E+01	1.93E+01	1.57E+01	1.26E+01	1.14E+01	1.12E+01
3.00	2.30E+01	1.52E+01	1.40E+01	1.16E+01	8.91E+00	7.16E+00	6.09E+00
3.50	1.71E+01	1.18E+01	1.10E+01	8.98E+00	6.22E+00	4.12E+00	2.86E+00
4.00	1.34E+01	9.17E+00	8.45E+00	6.69E+00	4.26E+00	2.52E+00	1.58E+00
5.00	8.52E+00	4.99E+00	4.45E+00	3.32E+00	2.13E+00	1.47E+00	1.13E+00
6.00	5.31E+00	2.70E+00	2.36E+00	1.74E+00	1.29E+00	1.23E+00	1.35E+00
7.00	3.37E+00	1.71E+00	1.50E+00	1.14E+00	9.07E−01	9.34E−01	1.09E+00
8.00	2.30E+00	1.29E+00	1.16E+00	9.03E−01	6.77E−01	5.70E−01	5.22E−01
9.00	1.69E+00	1.06E+00	9.66E−01	7.64E−01	5.04E−01	3.16E−01	2.07E−01
10.00	1.31E+00	8.68E−01	7.98E−01	6.22E−01	3.65E−01	1.83E−01	9.45E−02
12.50	7.85E−01	4.48E−01	3.96E−01	2.82E−01	1.52E−01	7.87E−02	4.46E−02
15.00	4.64E−01	2.10E−01	1.78E−01	1.20E−01	7.46E−02	5.81E−02	5.35E−02
17.50	2.68E−01	1.11E−01	9.35E−02	6.39E−02	4.58E−02	4.66E−02	5.68E−02
20.00	1.61E−01	7.08E−02	6.08E−02	4.36E−02	3.28E−02	3.28E−02	3.79E−02
22.50	1.05E−01	5.22E−02	4.61E−02	3.47E−02	2.50E−02	2.05E−02	1.83E−02
25.00	7.37E−02	4.14E−02	3.74E−02	2.89E−02	1.90E−02	1.22E−02	8.16E−03
27.50	5.53E−02	3.36E−02	3.06E−02	2.37E−02	1.41E−02	7.32E−03	3.87E−03
30.00	4.34E−02	2.70E−02	2.45E−02	1.86E−02	1.02E−02	4.57E−03	2.11E−03
35.00	2.85E−02	1.63E−02	1.44E−02	1.01E−02	4.80E−03	1.95E−03	8.53E−04
40.00	1.91E−02	9.38E−03	7.99E−03	5.07E−03	2.21E−03	9.20E−04	4.38E−04
45.00	1.27E−02	5.37E−03	4.41E−03	2.59E−03	1.07E−03	4.71E−04	2.51E−04
50.00	8.43E−03	3.12E−03	2.49E−03	1.38E−03	5.55E−04	2.61E−04	1.54E−04
55.00	5.64E−03	1.90E−03	1.50E−03	8.04E−04	3.28E−04	1.66E−04	1.09E−04
60.00	3.85E−03	1.23E−03	9.60E−04	5.16E−04	2.23E−04	1.26E−04	9.27E−05
65.00	2.74E−03	8.51E−04	6.67E−04	3.64E−04	1.68E−04	1.05E−04	8.44E−05
70.00	2.04E−03	6.36E−04	5.01E−04	2.81E−04	1.39E−04	9.44E−05	8.18E−05
75.00	1.61E−03	5.09E−04	4.05E−04	2.34E−04	1.23E−04	8.85E−05	8.03E−05
80.00	1.33E−03	4.32E−04	3.47E−04	2.06E−04	1.13E−04	8.38E−05	7.71E−05
85.00	1.14E−03	3.82E−04	3.09E−04	1.88E−04	1.06E−04	8.09E−05	7.49E−05
90.00	1.02E−03	3.50E−04	2.85E−04	1.77E−04	1.03E−04	7.85E−05	7.23E−05
95.00	9.27E−04	3.26E−04	2.68E−04	1.69E−04	9.99E−05	7.69E−05	7.06E−05
105.00	8.15E−04	2.97E−04	2.46E−04	1.59E−04	9.71E−05	7.55E−05	6.88E−05
120.00	7.22E−04	2.73E−04	2.28E−04	1.52E−04	9.60E−05	7.59E−05	6.93E−05
135.00	6.73E−04	2.61E−04	2.21E−04	1.50E−04	9.76E−05	7.80E−05	7.10E−05
150.00	6.44E−04	2.55E−04	2.17E−04	1.50E−04	9.96E−05	8.04E−05	7.31E−05
165.00	6.29E−04	2.53E−04	2.15E−04	1.50E−04	1.02E−04	8.26E−05	7.52E−05
180.00	6.24E−04	2.53E−04	2.15E−04	1.51E−04	1.03E−04	8.36E−05	7.62E−05
total	1.30E+00	8.54E−01	7.87E−01	6.43E−01	4.85E−01	3.95E−01	3.53E−01
rel ff	1.39E+00	9.14E−01	8.43E−01	6.89E−01	5.26E−01	4.33E−01	3.83E−01
nrl ff	1.55E+00	1.03E+00	9.45E−01	7.73E−01	5.90E−01	4.86E−01	4.30E−01

TABLE 1. Predicted *S*-matrix differential elastic scattering cross sections for photon energies (50.0, 59.54, 145.4, 316.5, 411.8, 468.1, 661.6, 778.9, 964.0, 1004.8, 1112.1, 1274.5, 1408.0 and 1500.0). The angle integrated total cross sections for each element and energies are presented. ''total'' represents total cross sections from this work, ''rel ff'' represents total cross sections calculated from the relativistic form factor and ''nrl ff'' represents total cross sections calculated from the nonrelativistic form factor—Continued[a]

θ (deg)	Photon energy (keV)						
	50.0	59.5	145.4	316.5	411.8	468.1	661.6
Thallium ($Z=81$)							
0.00	5.00E+02	5.02E+02	5.12E+02	5.11E+02	5.10E+02	5.10E+02	5.09E+02
0.01	5.00E+02	5.02E+02	5.12E+02	5.11E+02	5.10E+02	5.10E+02	5.09E+02
0.02	5.00E+02	5.02E+02	5.12E+02	5.11E+02	5.10E+02	5.09E+02	5.08E+02
0.04	5.00E+02	5.02E+02	5.12E+02	5.10E+02	5.09E+02	5.08E+02	5.07E+02
0.06	5.00E+02	5.02E+02	5.12E+02	5.10E+02	5.08E+02	5.07E+02	5.04E+02
0.10	5.00E+02	5.02E+02	5.12E+02	5.07E+02	5.04E+02	5.02E+02	4.94E+02
0.20	5.00E+02	5.01E+02	5.09E+02	4.97E+02	4.87E+02	4.81E+02	4.59E+02
0.30	4.99E+02	5.01E+02	5.05E+02	4.81E+02	4.64E+02	4.54E+02	4.17E+02
0.40	4.98E+02	5.00E+02	5.00E+02	4.63E+02	4.40E+02	4.25E+02	3.76E+02
0.50	4.98E+02	4.98E+02	4.93E+02	4.44E+02	4.13E+02	3.96E+02	3.38E+02
0.60	4.97E+02	4.97E+02	4.86E+02	4.24E+02	3.88E+02	3.67E+02	3.01E+02
0.70	4.96E+02	4.95E+02	4.78E+02	4.04E+02	3.63E+02	3.40E+02	2.69E+02
0.80	4.94E+02	4.93E+02	4.70E+02	3.85E+02	3.39E+02	3.14E+02	2.40E+02
1.00	4.92E+02	4.89E+02	4.53E+02	3.47E+02	2.94E+02	2.67E+02	1.93E+02
1.20	4.87E+02	4.84E+02	4.35E+02	3.12E+02	2.56E+02	2.28E+02	1.57E+02
1.50	4.81E+02	4.75E+02	4.07E+02	2.65E+02	2.08E+02	1.81E+02	1.18E+02
1.70	4.76E+02	4.69E+02	3.89E+02	2.38E+02	1.82E+02	1.57E+02	9.80E+01
2.00	4.69E+02	4.59E+02	3.62E+02	2.03E+02	1.51E+02	1.28E+02	7.50E+01
2.50	4.55E+02	4.41E+02	3.21E+02	1.58E+02	1.12E+02	9.18E+01	4.89E+01
3.00	4.41E+02	4.22E+02	2.83E+02	1.25E+02	8.47E+01	6.74E+01	3.31E+01
3.50	4.26E+02	4.04E+02	2.50E+02	1.00E+02	6.45E+01	5.03E+01	2.39E+01
4.00	4.10E+02	3.85E+02	2.21E+02	8.09E+01	4.95E+01	3.82E+01	1.85E+01
5.00	3.79E+02	3.49E+02	1.74E+02	5.39E+01	3.07E+01	2.38E+01	1.26E+01
6.00	3.47E+02	3.15E+02	1.40E+02	3.72E+01	2.12E+01	1.65E+01	8.69E+00
7.00	3.15E+02	2.83E+02	1.14E+02	2.69E+01	1.61E+01	1.23E+01	5.75E+00
8.00	2.87E+02	2.55E+02	9.30E+01	2.04E+01	1.28E+01	9.55E+00	3.80E+00
9.00	2.62E+02	2.30E+02	7.65E+01	1.62E+01	1.02E+01	7.41E+00	2.63E+00
10.00	2.41E+02	2.07E+02	6.31E+01	1.33E+01	7.99E+00	5.70E+00	1.97E+00
12.50	1.97E+02	1.61E+02	3.99E+01	8.45E+00	4.17E+00	2.96E+00	1.22E+00
15.00	1.61E+02	1.27E+02	2.68E+01	5.40E+00	2.38E+00	1.71E+00	8.13E−01
17.50	1.29E+02	1.02E+02	1.96E+01	3.48E+00	1.61E+00	1.16E+00	5.12E−01
20.00	1.03E+02	8.18E+01	1.54E+01	2.34E+00	1.22E+00	8.63E−01	3.13E−01
22.50	8.19E+01	6.59E+01	1.24E+01	1.67E+00	9.49E−01	6.54E−01	1.95E−01
25.00	6.58E+01	5.33E+01	1.01E+01	1.26E+00	7.25E−01	4.86E−01	1.29E−01
27.50	5.35E+01	4.31E+01	8.12E+00	1.00E+00	5.40E−01	3.54E−01	9.20E−02
30.00	4.40E+01	3.51E+01	6.44E+00	8.11E−01	3.97E−01	2.56E−01	6.98E−02
35.00	3.09E+01	2.40E+01	3.99E+00	5.35E−01	2.15E−01	1.38E−01	4.54E−02
40.00	2.28E+01	1.72E+01	2.56E+00	3.48E−01	1.25E−01	8.14E−02	3.19E−02
45.00	1.74E+01	1.30E+01	1.78E+00	2.26E−01	8.04E−02	5.35E−02	2.27E−02
50.00	1.36E+01	1.02E+01	1.33E+00	1.50E−01	5.70E−02	3.85E−02	1.62E−02
55.00	1.08E+01	8.14E+00	1.05E+00	1.03E−01	4.32E−02	2.95E−02	1.15E−02
60.00	8.62E+00	6.58E+00	8.56E−01	7.46E−02	3.44E−02	2.36E−02	8.35E−03
65.00	6.91E+00	5.34E+00	7.08E−01	5.69E−02	2.82E−02	1.93E−02	6.19E−03
70.00	5.57E+00	4.34E+00	5.91E−01	4.57E−02	2.38E−02	1.62E−02	4.73E−03
75.00	4.53E+00	3.55E+00	4.98E−01	3.85E−02	2.06E−02	1.38E−02	3.77E−03
80.00	3.73E+00	2.94E+00	4.25E−01	3.38E−02	1.82E−02	1.21E−02	3.12E−03
85.00	3.13E+00	2.47E+00	3.68E−01	3.07E−02	1.64E−02	1.08E−02	2.68E−03
90.00	2.68E+00	2.12E+00	3.26E−01	2.88E−02	1.51E−02	9.87E−03	2.38E−03
95.00	2.35E+00	1.86E+00	2.94E−01	2.76E−02	1.42E−02	9.18E−03	2.17E−03
105.00	1.93E+00	1.54E+00	2.56E−01	2.66E−02	1.30E−02	8.30E−03	1.90E−03
120.00	1.68E+00	1.33E+00	2.33E−01	2.68E−02	1.23E−02	7.62E−03	1.67E−03
135.00	1.62E+00	1.29E+00	2.30E−01	2.75E−02	1.19E−02	7.26E−03	1.55E−03
150.00	1.64E+00	1.30E+00	2.33E−01	2.82E−02	1.17E−02	7.05E−03	1.48E−03
165.00	1.68E+00	1.33E+00	2.37E−01	2.87E−02	1.16E−02	6.93E−03	1.44E−03
180.00	1.69E+00	1.34E+00	2.38E−01	2.88E−02	1.16E−02	6.89E−03	1.43E−03
total	1.76E+02	1.43E+02	3.46E+01	8.00E+00	4.81E+00	3.72E+00	1.87E+00
rel ff	2.07E+02	1.56E+02	3.36E+01	8.06E+00	4.91E+00	3.85E+00	1.97E+00
nrl ff	2.18E+02	1.65E+02	3.68E+01	8.95E+00	5.49E+00	4.30E+00	2.21E+00

TABLE 1. Predicted *S*-matrix differential elastic scattering cross sections for photon energies (50.0, 59.54, 145.4, 316.5, 411.8, 468.1, 661.6, 778.9, 964.0, 1004.8, 1112.1, 1274.5, 1408.0 and 1500.0). The angle integrated total cross sections for each element and energies are presented. ''total'' represents total cross sections from this work, ''rel ff'' represents total cross sections calculated from the relativistic form factor and ''nrl ff'' represents total cross sections calculated from the nonrelativistic form factor—Continued[a]

θ (deg)	Photon energy (keV)						
	778.9	964.0	1004.8	1112.1	1274.5	1408.0	1500.0
Thallium ($Z=81$)							
0.00	5.09E+02	5.09E+02	5.09E+02	5.08E+02	5.08E+02	5.08E+02	5.07E+02
0.01	5.08E+02	5.08E+02	5.08E+02	5.08E+02	5.07E+02	5.07E+02	5.07E+02
0.02	5.08E+02	5.07E+02	5.07E+02	5.07E+02	5.06E+02	5.05E+02	5.04E+02
0.04	5.05E+02	5.03E+02	5.03E+02	5.01E+02	4.99E+02	4.96E+02	4.94E+02
0.06	5.01E+02	4.97E+02	4.95E+02	4.92E+02	4.88E+02	4.83E+02	4.80E+02
0.10	4.88E+02	4.78E+02	4.76E+02	4.70E+02	4.60E+02	4.52E+02	4.47E+02
0.20	4.44E+02	4.20E+02	4.15E+02	4.01E+02	3.81E+02	3.65E+02	3.55E+02
0.30	3.95E+02	3.61E+02	3.54E+02	3.35E+02	3.08E+02	2.87E+02	2.74E+02
0.40	3.48E+02	3.07E+02	2.98E+02	2.77E+02	2.47E+02	2.26E+02	2.13E+02
0.50	3.05E+02	2.60E+02	2.51E+02	2.28E+02	2.00E+02	1.80E+02	1.68E+02
0.60	2.67E+02	2.20E+02	2.11E+02	1.90E+02	1.63E+02	1.45E+02	1.35E+02
0.70	2.34E+02	1.88E+02	1.79E+02	1.59E+02	1.35E+02	1.19E+02	1.10E+02
0.80	2.05E+02	1.62E+02	1.54E+02	1.35E+02	1.12E+02	9.76E+01	8.93E+01
1.00	1.60E+02	1.22E+02	1.15E+02	9.89E+01	7.94E+01	6.67E+01	5.92E+01
1.20	1.27E+02	9.35E+01	8.75E+01	7.37E+01	5.70E+01	4.60E+01	3.95E+01
1.50	9.19E+01	6.37E+01	5.90E+01	4.82E+01	3.58E+01	2.81E+01	2.38E+01
1.70	7.46E+01	4.98E+01	4.58E+01	3.69E+01	2.73E+01	2.18E+01	1.89E+01
2.00	5.50E+01	3.51E+01	3.20E+01	2.57E+01	1.96E+01	1.66E+01	1.54E+01
2.50	3.46E+01	2.17E+01	1.98E+01	1.62E+01	1.29E+01	1.18E+01	1.17E+01
3.00	2.37E+01	1.55E+01	1.44E+01	1.19E+01	9.17E+00	7.51E+00	6.53E+00
3.50	1.76E+01	1.21E+01	1.13E+01	9.22E+00	6.46E+00	4.36E+00	3.07E+00
4.00	1.38E+01	9.47E+00	8.74E+00	6.95E+00	4.45E+00	2.65E+00	1.65E+00
5.00	8.82E+00	5.23E+00	4.68E+00	3.50E+00	2.23E+00	1.50E+00	1.11E+00
6.00	5.54E+00	2.83E+00	2.48E+00	1.83E+00	1.34E+00	1.25E+00	1.34E+00
7.00	3.52E+00	1.77E+00	1.56E+00	1.17E+00	9.34E−01	9.70E−01	1.15E+00
8.00	2.39E+00	1.32E+00	1.18E+00	9.20E−01	6.97E−01	6.08E−01	5.79E−01
9.00	1.74E+00	1.08E+00	9.86E−01	7.80E−01	5.23E−01	3.40E−01	2.32E−01
10.00	1.36E+00	8.93E−01	8.21E−01	6.43E−01	3.82E−01	1.96E−01	1.03E−01
12.50	8.12E−01	4.71E−01	4.19E−01	3.00E−01	1.61E−01	8.11E−02	4.45E−02
15.00	4.85E−01	2.23E−01	1.90E−01	1.28E−01	7.80E−02	5.86E−02	5.18E−02
17.50	2.82E−01	1.17E−01	9.82E−02	6.68E−02	4.73E−02	4.73E−02	5.69E−02
20.00	1.70E−01	7.33E−02	6.28E−02	4.47E−02	3.35E−02	3.40E−02	4.00E−02
22.50	1.10E−01	5.35E−02	4.71E−02	3.52E−02	2.55E−02	2.15E−02	2.00E−02
25.00	7.66E−02	4.23E−02	3.80E−02	2.93E−02	1.95E−02	1.29E−02	9.02E−03
27.50	5.71E−02	3.43E−02	3.12E−02	2.42E−02	1.46E−02	7.80E−03	4.26E−03
30.00	4.46E−02	2.77E−02	2.52E−02	1.92E−02	1.06E−02	4.88E−03	2.29E−03
35.00	2.92E−02	1.69E−02	1.50E−02	1.06E−02	5.11E−03	2.09E−03	9.08E−04
40.00	1.97E−02	9.86E−03	8.43E−03	5.41E−03	2.38E−03	9.88E−04	4.65E−04
45.00	1.32E−02	5.70E−03	4.70E−03	2.79E−03	1.16E−03	5.10E−04	2.68E−04
50.00	8.83E−03	3.33E−03	2.68E−03	1.50E−03	6.07E−04	2.84E−04	1.66E−04
55.00	5.94E−03	2.04E−03	1.61E−03	8.75E−04	3.59E−04	1.82E−04	1.18E−04
60.00	4.09E−03	1.32E−03	1.04E−03	5.63E−04	2.44E−04	1.38E−04	1.00E−04
65.00	2.92E−03	9.22E−04	7.24E−04	3.98E−04	1.84E−04	1.14E−04	9.14E−05
70.00	2.19E−03	6.91E−04	5.46E−04	3.07E−04	1.52E−04	1.03E−04	8.84E−05
75.00	1.73E−03	5.54E−04	4.41E−04	2.56E−04	1.34E−04	9.61E−05	8.67E−05
80.00	1.43E−03	4.71E−04	3.78E−04	2.25E−04	1.23E−04	9.08E−05	8.31E−05
85.00	1.23E−03	4.16E−04	3.37E−04	2.05E−04	1.16E−04	8.75E−05	8.07E−05
90.00	1.10E−03	3.81E−04	3.11E−04	1.93E−04	1.12E−04	8.49E−05	7.78E−05
95.00	1.01E−03	3.56E−04	2.92E−04	1.84E−04	1.08E−04	8.29E−05	7.58E−05
105.00	8.85E−04	3.24E−04	2.68E−04	1.73E−04	1.05E−04	8.11E−05	7.36E−05
120.00	7.85E−04	2.96E−04	2.48E−04	1.64E−04	1.03E−04	8.12E−05	7.38E−05
135.00	7.31E−04	2.84E−04	2.39E−04	1.62E−04	1.05E−04	8.32E−05	7.54E−05
150.00	7.00E−04	2.77E−04	2.35E−04	1.61E−04	1.07E−04	8.55E−05	7.76E−05
165.00	6.83E−04	2.74E−04	2.33E−04	1.62E−04	1.09E−04	8.78E−05	7.98E−05
180.00	6.78E−04	2.73E−04	2.33E−04	1.62E−04	1.10E−04	8.89E−05	8.09E−05
total	1.35E+00	8.84E−01	8.14E−01	6.65E−01	5.02E−01	4.09E−01	3.65E−01
rel ff	1.44E+00	9.46E−01	8.72E−01	7.13E−01	5.44E−01	4.48E−01	3.96E−01
nrl ff	1.61E+00	1.06E+00	9.81E−01	8.03E−01	6.13E−01	5.05E−01	4.47E−01

TABLE 1. Predicted *S*-matrix differential elastic scattering cross sections for photon energies (50.0, 59.54, 145.4, 316.5, 411.8, 468.1, 661.6, 778.9, 964.0, 1004.8, 1112.1, 1274.5, 1408.0 and 1500.0). The angle integrated total cross sections for each element and energies are presented. ''total'' represents total cross sections from this work, ''rel ff'' represents total cross sections calculated from the relativistic form factor and ''nrl ff'' represents total cross sections calculated from the nonrelativistic form factor—Continued[a]

θ (deg)	Photon energy (keV)						
	50.0	59.5	145.4	316.5	411.8	468.1	661.6
Lead ($Z=82$)							
0.00	5.13E+02	5.15E+02	5.24E+02	5.24E+02	5.23E+02	5.22E+02	5.22E+02
0.01	5.13E+02	5.15E+02	5.24E+02	5.23E+02	5.22E+02	5.22E+02	5.21E+02
0.02	5.13E+02	5.15E+02	5.24E+02	5.23E+02	5.22E+02	5.22E+02	5.21E+02
0.04	5.13E+02	5.15E+02	5.24E+02	5.23E+02	5.22E+02	5.21E+02	5.19E+02
0.06	5.13E+02	5.15E+02	5.24E+02	5.22E+02	5.20E+02	5.19E+02	5.16E+02
0.10	5.13E+02	5.15E+02	5.24E+02	5.20E+02	5.16E+02	5.14E+02	5.06E+02
0.20	5.13E+02	5.15E+02	5.21E+02	5.09E+02	4.99E+02	4.92E+02	4.70E+02
0.30	5.13E+02	5.14E+02	5.17E+02	4.93E+02	4.76E+02	4.65E+02	4.27E+02
0.40	5.12E+02	5.13E+02	5.12E+02	4.74E+02	4.50E+02	4.35E+02	3.85E+02
0.50	5.11E+02	5.12E+02	5.05E+02	4.55E+02	4.23E+02	4.05E+02	3.46E+02
0.60	5.10E+02	5.10E+02	4.98E+02	4.35E+02	3.97E+02	3.76E+02	3.09E+02
0.70	5.09E+02	5.08E+02	4.90E+02	4.14E+02	3.72E+02	3.48E+02	2.76E+02
0.80	5.07E+02	5.06E+02	4.81E+02	3.94E+02	3.47E+02	3.21E+02	2.46E+02
1.00	5.05E+02	5.02E+02	4.64E+02	3.55E+02	3.02E+02	2.74E+02	1.98E+02
1.20	5.00E+02	4.96E+02	4.45E+02	3.19E+02	2.62E+02	2.34E+02	1.61E+02
1.50	4.94E+02	4.87E+02	4.17E+02	2.71E+02	2.13E+02	1.86E+02	1.21E+02
1.70	4.89E+02	4.81E+02	3.98E+02	2.44E+02	1.87E+02	1.61E+02	1.01E+02
2.00	4.81E+02	4.71E+02	3.71E+02	2.09E+02	1.55E+02	1.31E+02	7.77E+01
2.50	4.67E+02	4.53E+02	3.28E+02	1.63E+02	1.15E+02	9.49E+01	5.08E+01
3.00	4.52E+02	4.33E+02	2.89E+02	1.29E+02	8.76E+01	6.98E+01	3.43E+01
3.50	4.37E+02	4.14E+02	2.56E+02	1.04E+02	6.69E+01	5.22E+01	2.47E+01
4.00	4.21E+02	3.95E+02	2.26E+02	8.38E+01	5.15E+01	3.97E+01	1.91E+01
5.00	3.89E+02	3.58E+02	1.79E+02	5.59E+01	3.18E+01	2.46E+01	1.29E+01
6.00	3.56E+02	3.23E+02	1.44E+02	3.86E+01	2.18E+01	1.70E+01	8.99E+00
7.00	3.24E+02	2.91E+02	1.17E+02	2.78E+01	1.65E+01	1.27E+01	6.00E+00
8.00	2.94E+02	2.62E+02	9.59E+01	2.11E+01	1.31E+01	9.83E+00	3.97E+00
9.00	2.69E+02	2.36E+02	7.91E+01	1.67E+01	1.05E+01	7.66E+00	2.75E+00
10.00	2.47E+02	2.13E+02	6.53E+01	1.36E+01	8.28E+00	5.92E+00	2.04E+00
12.50	2.03E+02	1.66E+02	4.13E+01	8.71E+00	4.37E+00	3.10E+00	1.25E+00
15.00	1.66E+02	1.32E+02	2.77E+01	5.61E+00	2.48E+00	1.78E+00	8.41E−01
17.50	1.34E+02	1.05E+02	2.01E+01	3.63E+00	1.66E+00	1.19E+00	5.36E−01
20.00	1.07E+02	8.50E+01	1.57E+01	2.44E+00	1.25E+00	8.88E−01	3.29E−01
22.50	8.57E+01	6.87E+01	1.27E+01	1.73E+00	9.77E−01	6.76E−01	2.06E−01
25.00	6.90E+01	5.56E+01	1.04E+01	1.31E+00	7.52E−01	5.05E−01	1.36E−01
27.50	5.60E+01	4.51E+01	8.36E+00	1.03E+00	5.64E−01	3.71E−01	9.60E−02
30.00	4.61E+01	3.68E+01	6.66E+00	8.37E−01	4.17E−01	2.69E−01	7.23E−02
35.00	3.23E+01	2.51E+01	4.15E+00	5.56E−01	2.27E−01	1.45E−01	4.67E−02
40.00	2.38E+01	1.79E+01	2.66E+00	3.64E−01	1.31E−01	8.52E−02	3.27E−02
45.00	1.81E+01	1.35E+01	1.83E+00	2.37E−01	8.39E−02	5.55E−02	2.34E−02
50.00	1.42E+01	1.05E+01	1.36E+00	1.58E−01	5.90E−02	3.97E−02	1.67E−02
55.00	1.13E+01	8.44E+00	1.07E+00	1.08E−01	4.45E−02	3.03E−02	1.20E−02
60.00	9.02E+00	6.84E+00	8.74E−01	7.82E−02	3.53E−02	2.42E−02	8.74E−03
65.00	7.26E+00	5.58E+00	7.24E−01	5.94E−02	2.90E−02	1.98E−02	6.51E−03
70.00	5.88E+00	4.56E+00	6.06E−01	4.76E−02	2.45E−02	1.67E−02	5.01E−03
75.00	4.81E+00	3.75E+00	5.13E−01	3.99E−02	2.12E−02	1.43E−02	4.01E−03
80.00	3.98E+00	3.12E+00	4.39E−01	3.50E−02	1.88E−02	1.26E−02	3.33E−03
85.00	3.35E+00	2.63E+00	3.82E−01	3.18E−02	1.70E−02	1.13E−02	2.87E−03
90.00	2.88E+00	2.27E+00	3.39E−01	2.97E−02	1.57E−02	1.03E−02	2.55E−03
95.00	2.53E+00	2.00E+00	3.07E−01	2.85E−02	1.48E−02	9.64E−03	2.33E−03
105.00	2.09E+00	1.65E+00	2.68E−01	2.75E−02	1.37E−02	8.75E−03	2.04E−03
120.00	1.81E+00	1.43E+00	2.44E−01	2.77E−02	1.29E−02	8.08E−03	1.81E−03
135.00	1.75E+00	1.39E+00	2.41E−01	2.86E−02	1.26E−02	7.73E−03	1.68E−03
150.00	1.77E+00	1.40E+00	2.44E−01	2.94E−02	1.24E−02	7.52E−03	1.60E−03
165.00	1.80E+00	1.42E+00	2.48E−01	2.99E−02	1.23E−02	7.40E−03	1.56E−03
180.00	1.82E+00	1.43E+00	2.50E−01	3.01E−02	1.23E−02	7.35E−03	1.55E−03
total	1.84E+02	1.49E+02	3.57E+01	8.27E+00	4.97E+00	3.85E+00	1.94E+00
rel ff	2.13E+02	1.61E+02	3.47E+01	8.32E+00	5.08E+00	3.97E+00	2.04E+00
nrl ff	2.25E+02	1.71E+02	3.81E+01	9.27E+00	5.69E+00	4.46E+00	2.29E+00

TABLE 1. Predicted *S*-matrix differential elastic scattering cross sections for photon energies (50.0, 59.54, 145.4, 316.5, 411.8, 468.1, 661.6, 778.9, 964.0, 1004.8, 1112.1, 1274.5, 1408.0 and 1500.0). The angle integrated total cross sections for each element and energies are presented. ''total'' represents total cross sections from this work, ''rel ff'' represents total cross sections calculated from the relativistic form factor and ''nrl ff'' represents total cross sections calculated from the nonrelativistic form factor—Continued[a]

θ (deg)	Photon energy (keV)						
	778.9	964.0	1004.8	1112.1	1274.5	1408.0	1500.0
Lead ($Z=82$)							
0.00	5.21E+02	5.21E+02	5.21E+02	5.21E+02	5.21E+02	5.20E+02	5.20E+02
0.01	5.21E+02	5.20E+02	5.20E+02	5.20E+02	5.20E+02	5.19E+02	5.19E+02
0.02	5.20E+02	5.20E+02	5.19E+02	5.19E+02	5.18E+02	5.17E+02	5.16E+02
0.04	5.18E+02	5.15E+02	5.15E+02	5.13E+02	5.11E+02	5.08E+02	5.06E+02
0.06	5.13E+02	5.09E+02	5.07E+02	5.04E+02	4.99E+02	4.95E+02	4.92E+02
0.10	5.00E+02	4.90E+02	4.87E+02	4.81E+02	4.71E+02	4.63E+02	4.57E+02
0.20	4.54E+02	4.30E+02	4.25E+02	4.11E+02	3.90E+02	3.74E+02	3.64E+02
0.30	4.04E+02	3.70E+02	3.62E+02	3.43E+02	3.15E+02	2.94E+02	2.80E+02
0.40	3.56E+02	3.14E+02	3.05E+02	2.83E+02	2.53E+02	2.32E+02	2.18E+02
0.50	3.12E+02	2.66E+02	2.57E+02	2.34E+02	2.05E+02	1.85E+02	1.73E+02
0.60	2.73E+02	2.26E+02	2.17E+02	1.95E+02	1.67E+02	1.49E+02	1.39E+02
0.70	2.39E+02	1.93E+02	1.84E+02	1.64E+02	1.39E+02	1.22E+02	1.13E+02
0.80	2.11E+02	1.66E+02	1.58E+02	1.39E+02	1.16E+02	1.01E+02	9.23E+01
1.00	1.65E+02	1.26E+02	1.18E+02	1.02E+02	8.22E+01	6.91E+01	6.15E+01
1.20	1.31E+02	9.66E+01	9.05E+01	7.63E+01	5.91E+01	4.78E+01	4.11E+01
1.50	9.51E+01	6.61E+01	6.12E+01	5.01E+01	3.72E+01	2.91E+01	2.45E+01
1.70	7.73E+01	5.17E+01	4.75E+01	3.84E+01	2.83E+01	2.25E+01	1.93E+01
2.00	5.71E+01	3.64E+01	3.33E+01	2.67E+01	2.01E+01	1.70E+01	1.57E+01
2.50	3.59E+01	2.23E+01	2.04E+01	1.66E+01	1.33E+01	1.21E+01	1.20E+01
3.00	2.45E+01	1.59E+01	1.47E+01	1.21E+01	9.44E+00	7.86E+00	6.96E+00
3.50	1.81E+01	1.24E+01	1.15E+01	9.45E+00	6.70E+00	4.61E+00	3.31E+00
4.00	1.42E+01	9.75E+00	9.01E+00	7.20E+00	4.65E+00	2.78E+00	1.74E+00
5.00	9.10E+00	5.48E+00	4.91E+00	3.69E+00	2.33E+00	1.53E+00	1.10E+00
6.00	5.76E+00	2.97E+00	2.60E+00	1.92E+00	1.39E+00	1.26E+00	1.32E+00
7.00	3.68E+00	1.83E+00	1.61E+00	1.21E+00	9.61E−01	1.00E+00	1.20E+00
8.00	2.49E+00	1.35E+00	1.21E+00	9.37E−01	7.18E−01	6.45E−01	6.37E−01
9.00	1.81E+00	1.10E+00	1.01E+00	7.94E−01	5.42E−01	3.66E−01	2.60E−01
10.00	1.40E+00	9.17E−01	8.43E−01	6.62E−01	3.99E−01	2.10E−01	1.14E−01
12.50	8.39E−01	4.95E−01	4.41E−01	3.18E−01	1.70E−01	8.38E−02	4.47E−02
15.00	5.06E−01	2.36E−01	2.01E−01	1.36E−01	8.18E−02	5.91E−02	5.02E−02
17.50	2.96E−01	1.23E−01	1.03E−01	7.00E−02	4.88E−02	4.80E−02	5.67E−02
20.00	1.78E−01	7.61E−02	6.50E−02	4.60E−02	3.43E−02	3.50E−02	4.19E−02
22.50	1.15E−01	5.49E−02	4.81E−02	3.57E−02	2.60E−02	2.26E−02	2.18E−02
25.00	7.96E−02	4.32E−02	3.87E−02	2.97E−02	2.00E−02	1.37E−02	9.97E−03
27.50	5.91E−02	3.51E−02	3.18E−02	2.46E−02	1.51E−02	8.31E−03	4.69E−03
30.00	4.60E−02	2.84E−02	2.58E−02	1.97E−02	1.11E−02	5.20E−03	2.49E−03
35.00	3.00E−02	1.76E−02	1.56E−02	1.11E−02	5.43E−03	2.23E−03	9.69E−04
40.00	2.03E−02	1.03E−02	8.89E−03	5.77E−03	2.57E−03	1.06E−03	4.93E−04
45.00	1.37E−02	6.03E−03	5.01E−03	3.00E−03	1.26E−03	5.51E−04	2.86E−04
50.00	9.23E−03	3.55E−03	2.87E−03	1.62E−03	6.64E−04	3.09E−04	1.79E−04
55.00	6.26E−03	2.19E−03	1.74E−03	9.52E−04	3.94E−04	1.98E−04	1.27E−04
60.00	4.33E−03	1.43E−03	1.13E−03	6.14E−04	2.67E−04	1.50E−04	1.09E−04
65.00	3.11E−03	9.98E−04	7.86E−04	4.34E−04	2.01E−04	1.24E−04	9.89E−05
70.00	2.34E−03	7.49E−04	5.93E−04	3.36E−04	1.66E−04	1.12E−04	9.54E−05
75.00	1.86E−03	6.02E−04	4.80E−04	2.79E−04	1.46E−04	1.04E−04	9.35E−05
80.00	1.54E−03	5.12E−04	4.12E−04	2.45E−04	1.34E−04	9.85E−05	8.95E−05
85.00	1.33E−03	4.53E−04	3.67E−04	2.24E−04	1.26E−04	9.47E−05	8.69E−05
90.00	1.19E−03	4.15E−04	3.39E−04	2.10E−04	1.21E−04	9.17E−05	8.37E−05
95.00	1.09E−03	3.87E−04	3.18E−04	2.00E−04	1.17E−04	8.95E−05	8.14E−05
105.00	9.60E−04	3.52E−04	2.92E−04	1.88E−04	1.13E−04	8.71E−05	7.88E−05
120.00	8.52E−04	3.22E−04	2.69E−04	1.78E−04	1.11E−04	8.69E−05	7.87E−05
135.00	7.94E−04	3.08E−04	2.59E−04	1.75E−04	1.12E−04	8.87E−05	8.02E−05
150.00	7.60E−04	3.00E−04	2.54E−04	1.74E−04	1.14E−04	9.10E−05	8.23E−05
165.00	7.41E−04	2.97E−04	2.52E−04	1.74E−04	1.16E−04	9.34E−05	8.47E−05
180.00	7.36E−04	2.96E−04	2.52E−04	1.75E−04	1.17E−04	9.45E−05	8.58E−05
total	1.39E+00	9.13E−01	8.42E−01	6.88E−01	5.19E−01	4.23E−01	3.77E−01
rel ff	1.48E+00	9.78E−01	9.02E−01	7.38E−01	5.63E−01	4.63E−01	4.10E−01
nrl ff	1.67E+00	1.10E+00	1.02E+00	8.34E−01	6.36E−01	5.24E−01	4.64E−01

TABLE 1. Predicted *S*-matrix differential elastic scattering cross sections for photon energies (50.0, 59.54, 145.4, 316.5, 411.8, 468.1, 661.6, 778.9, 964.0, 1004.8, 1112.1, 1274.5, 1408.0 and 1500.0). The angle integrated total cross sections for each element and energies are presented. ''total'' represents total cross sections from this work, ''rel ff'' represents total cross sections calculated from the relativistic form factor and ''nrl ff'' represents total cross sections calculated from the nonrelativistic form factor—Continued[a]

θ (deg)	Photon energy (keV)						
	50.0	59.5	145.4	316.5	411.8	468.1	661.6
Bismuth ($Z=83$)							
0.00	5.27E+02	5.28E+02	5.37E+02	5.36E+02	5.35E+02	5.35E+02	5.34E+02
0.01	5.27E+02	5.28E+02	5.37E+02	5.36E+02	5.35E+02	5.35E+02	5.34E+02
0.02	5.27E+02	5.28E+02	5.37E+02	5.36E+02	5.35E+02	5.34E+02	5.33E+02
0.04	5.27E+02	5.28E+02	5.37E+02	5.35E+02	5.34E+02	5.33E+02	5.31E+02
0.06	5.26E+02	5.28E+02	5.36E+02	5.35E+02	5.33E+02	5.32E+02	5.28E+02
0.10	5.26E+02	5.28E+02	5.36E+02	5.32E+02	5.28E+02	5.26E+02	5.17E+02
0.20	5.26E+02	5.28E+02	5.33E+02	5.20E+02	5.10E+02	5.03E+02	4.79E+02
0.30	5.26E+02	5.27E+02	5.29E+02	5.03E+02	4.85E+02	4.74E+02	4.35E+02
0.40	5.25E+02	5.26E+02	5.23E+02	4.84E+02	4.59E+02	4.44E+02	3.92E+02
0.50	5.24E+02	5.24E+02	5.16E+02	4.64E+02	4.31E+02	4.12E+02	3.52E+02
0.60	5.23E+02	5.23E+02	5.08E+02	4.43E+02	4.04E+02	3.83E+02	3.14E+02
0.70	5.22E+02	5.21E+02	5.00E+02	4.22E+02	3.78E+02	3.54E+02	2.81E+02
0.80	5.20E+02	5.19E+02	4.91E+02	4.01E+02	3.53E+02	3.27E+02	2.51E+02
1.00	5.17E+02	5.14E+02	4.72E+02	3.62E+02	3.07E+02	2.79E+02	2.03E+02
1.20	5.13E+02	5.08E+02	4.53E+02	3.25E+02	2.67E+02	2.39E+02	1.66E+02
1.50	5.06E+02	4.99E+02	4.24E+02	2.77E+02	2.18E+02	1.91E+02	1.25E+02
1.70	5.00E+02	4.92E+02	4.05E+02	2.49E+02	1.92E+02	1.66E+02	1.04E+02
2.00	4.92E+02	4.81E+02	3.77E+02	2.13E+02	1.59E+02	1.35E+02	8.04E+01
2.50	4.78E+02	4.62E+02	3.34E+02	1.67E+02	1.19E+02	9.81E+01	5.28E+01
3.00	4.62E+02	4.42E+02	2.95E+02	1.33E+02	9.05E+01	7.23E+01	3.58E+01
3.50	4.46E+02	4.22E+02	2.61E+02	1.07E+02	6.93E+01	5.41E+01	2.56E+01
4.00	4.30E+02	4.03E+02	2.31E+02	8.67E+01	5.35E+01	4.12E+01	1.96E+01
5.00	3.96E+02	3.65E+02	1.84E+02	5.80E+01	3.32E+01	2.56E+01	1.32E+01
6.00	3.62E+02	3.29E+02	1.48E+02	4.01E+01	2.26E+01	1.75E+01	9.25E+00
7.00	3.30E+02	2.97E+02	1.21E+02	2.89E+01	1.69E+01	1.30E+01	6.27E+00
8.00	3.00E+02	2.67E+02	9.90E+01	2.18E+01	1.34E+01	1.00E+01	4.18E+00
9.00	2.75E+02	2.41E+02	8.17E+01	1.72E+01	1.07E+01	7.86E+00	2.89E+00
10.00	2.52E+02	2.18E+02	6.76E+01	1.40E+01	8.55E+00	6.13E+00	2.12E+00
12.50	2.08E+02	1.71E+02	4.30E+01	8.94E+00	4.59E+00	3.25E+00	1.28E+00
15.00	1.71E+02	1.36E+02	2.88E+01	5.82E+00	2.60E+00	1.86E+00	8.65E−01
17.50	1.39E+02	1.09E+02	2.08E+01	3.80E+00	1.71E+00	1.23E+00	5.60E−01
20.00	1.12E+02	8.80E+01	1.60E+01	2.55E+00	1.28E+00	9.09E−01	3.48E−01
22.50	8.95E+01	7.13E+01	1.29E+01	1.81E+00	1.00E+00	6.94E−01	2.18E−01
25.00	7.21E+01	5.79E+01	1.06E+01	1.36E+00	7.76E−01	5.24E−01	1.43E−01
27.50	5.87E+01	4.71E+01	8.59E+00	1.06E+00	5.88E−01	3.88E−01	1.01E−01
30.00	4.83E+01	3.85E+01	6.90E+00	8.60E−01	4.38E−01	2.84E−01	7.50E−02
35.00	3.38E+01	2.63E+01	4.36E+00	5.74E−01	2.40E−01	1.54E−01	4.78E−02
40.00	2.48E+01	1.87E+01	2.80E+00	3.80E−01	1.39E−01	8.97E−02	3.34E−02
45.00	1.88E+01	1.40E+01	1.92E+00	2.49E−01	8.78E−02	5.78E−02	2.39E−02
50.00	1.47E+01	1.09E+01	1.41E+00	1.66E−01	6.10E−02	4.09E−02	1.72E−02
55.00	1.16E+01	8.68E+00	1.10E+00	1.14E−01	4.57E−02	3.10E−02	1.25E−02
60.00	9.31E+00	7.04E+00	8.98E−01	8.21E−02	3.61E−02	2.47E−02	9.14E−03
65.00	7.52E+00	5.76E+00	7.46E−01	6.21E−02	2.96E−02	2.02E−02	6.85E−03
70.00	6.12E+00	4.74E+00	6.28E−01	4.95E−02	2.50E−02	1.71E−02	5.30E−03
75.00	5.03E+00	3.92E+00	5.34E−01	4.14E−02	2.17E−02	1.47E−02	4.26E−03
80.00	4.19E+00	3.28E+00	4.60E−01	3.61E−02	1.93E−02	1.30E−02	3.55E−03
85.00	3.55E+00	2.79E+00	4.02E−01	3.27E−02	1.75E−02	1.17E−02	3.07E−03
90.00	3.06E+00	2.41E+00	3.58E−01	3.06E−02	1.63E−02	1.08E−02	2.74E−03
95.00	2.70E+00	2.13E+00	3.26E−01	2.93E−02	1.54E−02	1.01E−02	2.50E−03
105.00	2.24E+00	1.77E+00	2.86E−01	2.82E−02	1.43E−02	9.21E−03	2.20E−03
120.00	1.94E+00	1.54E+00	2.63E−01	2.86E−02	1.36E−02	8.56E−03	1.95E−03
135.00	1.87E+00	1.49E+00	2.61E−01	2.95E−02	1.33E−02	8.22E−03	1.82E−03
150.00	1.88E+00	1.50E+00	2.65E−01	3.04E−02	1.31E−02	8.01E−03	1.73E−03
165.00	1.91E+00	1.52E+00	2.70E−01	3.09E−02	1.30E−02	7.89E−03	1.69E−03
180.00	1.92E+00	1.53E+00	2.72E−01	3.11E−02	1.30E−02	7.85E−03	1.67E−03
total	1.91E+02	1.54E+02	3.68E+01	8.54E+00	5.13E+00	3.97E+00	2.00E+00
rel ff	2.20E+02	1.66E+02	3.58E+01	8.59E+00	5.24E+00	4.10E+00	2.11E+00
nrl ff	2.32E+02	1.76E+02	3.94E+01	9.60E+00	5.89E+00	4.62E+00	2.38E+00

TABLE 1. Predicted *S*-matrix differential elastic scattering cross sections for photon energies (50.0, 59.54, 145.4, 316.5, 411.8, 468.1, 661.6, 778.9, 964.0, 1004.8, 1112.1, 1274.5, 1408.0 and 1500.0). The angle integrated total cross sections for each element and energies are presented. ''total'' represents total cross sections from this work, ''rel ff'' represents total cross sections calculated from the relativistic form factor and ''nrl ff'' represents total cross sections calculated from the nonrelativistic form factor—Continued[a]

θ (deg)	Photon energy (keV)						
	778.9	964.0	1004.8	1112.1	1274.5	1408.0	1500.0
Bismuth ($Z=83$)							
0.00	5.34E+02	5.34E+02	5.34E+02	5.33E+02	5.33E+02	5.33E+02	5.32E+02
0.01	5.33E+02	5.33E+02	5.33E+02	5.33E+02	5.32E+02	5.32E+02	5.31E+02
0.02	5.33E+02	5.32E+02	5.32E+02	5.31E+02	5.30E+02	5.29E+02	5.28E+02
0.04	5.30E+02	5.27E+02	5.27E+02	5.25E+02	5.23E+02	5.20E+02	5.18E+02
0.06	5.25E+02	5.20E+02	5.19E+02	5.16E+02	5.11E+02	5.06E+02	5.03E+02
0.10	5.11E+02	5.00E+02	4.98E+02	4.91E+02	4.81E+02	4.72E+02	4.66E+02
0.20	4.63E+02	4.38E+02	4.33E+02	4.18E+02	3.97E+02	3.81E+02	3.70E+02
0.30	4.12E+02	3.76E+02	3.69E+02	3.49E+02	3.21E+02	2.99E+02	2.85E+02
0.40	3.63E+02	3.20E+02	3.11E+02	2.89E+02	2.58E+02	2.37E+02	2.23E+02
0.50	3.18E+02	2.71E+02	2.62E+02	2.39E+02	2.09E+02	1.89E+02	1.78E+02
0.60	2.78E+02	2.31E+02	2.22E+02	2.00E+02	1.72E+02	1.54E+02	1.43E+02
0.70	2.45E+02	1.98E+02	1.89E+02	1.68E+02	1.43E+02	1.26E+02	1.16E+02
0.80	2.15E+02	1.71E+02	1.63E+02	1.43E+02	1.19E+02	1.04E+02	9.48E+01
1.00	1.69E+02	1.29E+02	1.22E+02	1.05E+02	8.50E+01	7.15E+01	6.35E+01
1.20	1.35E+02	9.97E+01	9.34E+01	7.89E+01	6.13E+01	4.98E+01	4.30E+01
1.50	9.81E+01	6.85E+01	6.34E+01	5.20E+01	3.87E+01	3.04E+01	2.57E+01
1.70	7.99E+01	5.37E+01	4.94E+01	3.99E+01	2.94E+01	2.33E+01	2.00E+01
2.00	5.93E+01	3.80E+01	3.47E+01	2.78E+01	2.08E+01	1.73E+01	1.58E+01
2.50	3.74E+01	2.32E+01	2.12E+01	1.71E+01	1.36E+01	1.23E+01	1.21E+01
3.00	2.54E+01	1.63E+01	1.50E+01	1.23E+01	9.65E+00	8.20E+00	7.43E+00
3.50	1.86E+01	1.26E+01	1.17E+01	9.57E+00	6.90E+00	4.93E+00	3.70E+00
4.00	1.45E+01	9.95E+00	9.20E+00	7.38E+00	4.85E+00	2.98E+00	1.92E+00
5.00	9.35E+00	5.75E+00	5.17E+00	3.91E+00	2.45E+00	1.55E+00	1.08E+00
6.00	6.00E+00	3.15E+00	2.77E+00	2.04E+00	1.44E+00	1.25E+00	1.23E+00
7.00	3.85E+00	1.92E+00	1.68E+00	1.26E+00	9.88E−01	1.02E+00	1.20E+00
8.00	2.60E+00	1.38E+00	1.23E+00	9.50E−01	7.35E−01	6.85E−01	7.07E−01
9.00	1.88E+00	1.12E+00	1.01E+00	7.98E−01	5.57E−01	3.99E−01	3.03E−01
10.00	1.44E+00	9.32E−01	8.54E−01	6.71E−01	4.15E−01	2.29E−01	1.31E−01
12.50	8.63E−01	5.20E−01	4.66E−01	3.39E−01	1.81E−01	8.70E−02	4.48E−02
15.00	5.27E−01	2.52E−01	2.16E−01	1.47E−01	8.62E−02	5.90E−02	4.70E−02
17.50	3.12E−01	1.30E−01	1.10E−01	7.39E−02	5.05E−02	4.79E−02	5.46E−02
20.00	1.88E−01	7.93E−02	6.75E−02	4.73E−02	3.50E−02	3.58E−02	4.33E−02
22.50	1.21E−01	5.62E−02	4.90E−02	3.60E−02	2.64E−02	2.37E−02	2.39E−02
25.00	8.30E−02	4.38E−02	3.90E−02	2.97E−02	2.04E−02	1.46E−02	1.13E−02
27.50	6.11E−02	3.55E−02	3.21E−02	2.48E−02	1.55E−02	8.91E−03	5.30E−03
30.00	4.72E−02	2.88E−02	2.62E−02	2.01E−02	1.15E−02	5.57E−03	2.77E−03
35.00	3.07E−02	1.81E−02	1.62E−02	1.16E−02	5.76E−03	2.37E−03	1.03E−03
40.00	2.09E−02	1.08E−02	9.37E−03	6.16E−03	2.77E−03	1.13E−03	5.17E−04
45.00	1.42E−02	6.39E−03	5.33E−03	3.24E−03	1.38E−03	5.93E−04	3.02E−04
50.00	9.62E−03	3.79E−03	3.08E−03	1.76E−03	7.26E−04	3.35E−04	1.91E−04
55.00	6.57E−03	2.35E−03	1.88E−03	1.04E−03	4.32E−04	2.17E−04	1.38E−04
60.00	4.58E−03	1.54E−03	1.22E−03	6.70E−04	2.93E−04	1.64E−04	1.18E−04
65.00	3.32E−03	1.08E−03	8.53E−04	4.74E−04	2.20E−04	1.36E−04	1.07E−04
70.00	2.51E−03	8.13E−04	6.45E−04	3.66E−04	1.81E−04	1.22E−04	1.04E−04
75.00	1.99E−03	6.54E−04	5.23E−04	3.05E−04	1.59E−04	1.13E−04	1.01E−04
80.00	1.66E−03	5.57E−04	4.48E−04	2.68E−04	1.46E−04	1.07E−04	9.69E−05
85.00	1.44E−03	4.93E−04	4.00E−04	2.44E−04	1.37E−04	1.03E−04	9.39E−05
90.00	1.28E−03	4.51E−04	3.69E−04	2.29E−04	1.32E−04	9.92E−05	9.03E−05
95.00	1.18E−03	4.21E−04	3.46E−04	2.18E−04	1.27E−04	9.66E−05	8.76E−05
105.00	1.04E−03	3.83E−04	3.17E−04	2.04E−04	1.23E−04	9.37E−05	8.45E−05
120.00	9.25E−04	3.50E−04	2.92E−04	1.92E−04	1.19E−04	9.28E−05	8.38E−05
135.00	8.62E−04	3.34E−04	2.81E−04	1.89E−04	1.20E−04	9.44E−05	8.50E−05
150.00	8.25E−04	3.25E−04	2.75E−04	1.87E−04	1.22E−04	9.65E−05	8.71E−05
165.00	8.05E−04	3.21E−04	2.72E−04	1.87E−04	1.24E−04	9.89E−05	8.95E−05
180.00	7.99E−04	3.20E−04	2.72E−04	1.88E−04	1.25E−04	1.00E−04	9.06E−05
total	1.44E+00	9.43E−01	8.69E−01	7.10E−01	5.36E−01	4.36E−01	3.89E−01
rel ff	1.53E+00	1.01E+00	9.32E−01	7.62E−01	5.82E−01	4.79E−01	4.24E−01
nrl ff	1.74E+00	1.15E+00	1.06E+00	8.64E−01	6.60E−01	5.44E−01	4.81E−01

TABLE 1. Predicted *S*-matrix differential elastic scattering cross sections for photon energies (50.0, 59.54, 145.4, 316.5, 411.8, 468.1, 661.6, 778.9, 964.0, 1004.8, 1112.1, 1274.5, 1408.0 and 1500.0). The angle integrated total cross sections for each element and energies are presented. ''total'' represents total cross sections from this work, ''rel ff'' represents total cross sections calculated from the relativistic form factor and ''nrl ff'' represents total cross sections calculated from the nonrelativistic form factor—Continued[a]

θ (deg)	Photon energy (keV)						
	50.0	59.5	145.4	316.5	411.8	468.1	661.6
Polonium ($Z=84$)							
0.00	5.40E+02	5.42E+02	5.49E+02	5.49E+02	5.48E+02	5.48E+02	5.47E+02
0.01	5.40E+02	5.42E+02	5.49E+02	5.49E+02	5.48E+02	5.47E+02	5.46E+02
0.02	5.40E+02	5.42E+02	5.49E+02	5.49E+02	5.47E+02	5.47E+02	5.46E+02
0.04	5.40E+02	5.42E+02	5.49E+02	5.48E+02	5.47E+02	5.46E+02	5.44E+02
0.06	5.40E+02	5.41E+02	5.49E+02	5.47E+02	5.45E+02	5.44E+02	5.40E+02
0.10	5.40E+02	5.41E+02	5.49E+02	5.44E+02	5.41E+02	5.38E+02	5.29E+02
0.20	5.40E+02	5.41E+02	5.46E+02	5.32E+02	5.21E+02	5.14E+02	4.89E+02
0.30	5.39E+02	5.40E+02	5.41E+02	5.14E+02	4.95E+02	4.84E+02	4.43E+02
0.40	5.38E+02	5.39E+02	5.35E+02	4.94E+02	4.68E+02	4.52E+02	4.00E+02
0.50	5.37E+02	5.38E+02	5.27E+02	4.73E+02	4.39E+02	4.20E+02	3.58E+02
0.60	5.37E+02	5.36E+02	5.19E+02	4.51E+02	4.12E+02	3.90E+02	3.20E+02
0.70	5.35E+02	5.34E+02	5.10E+02	4.30E+02	3.85E+02	3.61E+02	2.86E+02
0.80	5.34E+02	5.32E+02	5.01E+02	4.08E+02	3.60E+02	3.33E+02	2.56E+02
1.00	5.30E+02	5.27E+02	4.82E+02	3.68E+02	3.13E+02	2.85E+02	2.08E+02
1.20	5.26E+02	5.20E+02	4.62E+02	3.31E+02	2.72E+02	2.44E+02	1.70E+02
1.50	5.18E+02	5.10E+02	4.32E+02	2.82E+02	2.23E+02	1.96E+02	1.29E+02
1.70	5.12E+02	5.03E+02	4.12E+02	2.54E+02	1.96E+02	1.70E+02	1.08E+02
2.00	5.03E+02	4.92E+02	3.84E+02	2.18E+02	1.64E+02	1.39E+02	8.31E+01
2.50	4.88E+02	4.72E+02	3.40E+02	1.72E+02	1.23E+02	1.01E+02	5.48E+01
3.00	4.72E+02	4.52E+02	3.00E+02	1.37E+02	9.34E+01	7.48E+01	3.73E+01
3.50	4.56E+02	4.31E+02	2.66E+02	1.10E+02	7.18E+01	5.61E+01	2.66E+01
4.00	4.39E+02	4.11E+02	2.36E+02	8.95E+01	5.56E+01	4.28E+01	2.02E+01
5.00	4.04E+02	3.72E+02	1.88E+02	6.01E+01	3.45E+01	2.66E+01	1.34E+01
6.00	3.69E+02	3.36E+02	1.52E+02	4.16E+01	2.33E+01	1.81E+01	9.51E+00
7.00	3.37E+02	3.03E+02	1.24E+02	3.00E+01	1.73E+01	1.33E+01	6.53E+00
8.00	3.07E+02	2.73E+02	1.02E+02	2.26E+01	1.36E+01	1.03E+01	4.39E+00
9.00	2.81E+02	2.47E+02	8.43E+01	1.77E+01	1.10E+01	8.08E+00	3.03E+00
10.00	2.58E+02	2.23E+02	6.99E+01	1.44E+01	8.81E+00	6.34E+00	2.21E+00
12.50	2.13E+02	1.76E+02	4.47E+01	9.18E+00	4.82E+00	3.41E+00	1.30E+00
15.00	1.76E+02	1.40E+02	2.99E+01	6.03E+00	2.72E+00	1.94E+00	8.89E−01
17.50	1.44E+02	1.13E+02	2.14E+01	3.96E+00	1.77E+00	1.27E+00	5.85E−01
20.00	1.16E+02	9.11E+01	1.64E+01	2.67E+00	1.31E+00	9.32E−01	3.68E−01
22.50	9.34E+01	7.39E+01	1.32E+01	1.88E+00	1.02E+00	7.13E−01	2.31E−01
25.00	7.54E+01	6.02E+01	1.08E+01	1.40E+00	8.00E−01	5.43E−01	1.51E−01
27.50	6.13E+01	4.91E+01	8.81E+00	1.10E+00	6.12E−01	4.05E−01	1.05E−01
30.00	5.05E+01	4.02E+01	7.13E+00	8.84E−01	4.59E−01	2.98E−01	7.78E−02
35.00	3.54E+01	2.75E+01	4.56E+00	5.93E−01	2.54E−01	1.63E−01	4.89E−02
40.00	2.58E+01	1.95E+01	2.94E+00	3.95E−01	1.46E−01	9.44E−02	3.41E−02
45.00	1.95E+01	1.45E+01	2.00E+00	2.62E−01	9.19E−02	6.03E−02	2.45E−02
50.00	1.51E+01	1.12E+01	1.46E+00	1.75E−01	6.33E−02	4.22E−02	1.78E−02
55.00	1.20E+01	8.93E+00	1.13E+00	1.20E−01	4.70E−02	3.18E−02	1.29E−02
60.00	9.61E+00	7.25E+00	9.21E−01	8.63E−02	3.69E−02	2.52E−02	9.54E−03
65.00	7.79E+00	5.94E+00	7.66E−01	6.50E−02	3.03E−02	2.07E−02	7.19E−03
70.00	6.37E+00	4.91E+00	6.47E−01	5.15E−02	2.56E−02	1.75E−02	5.59E−03
75.00	5.26E+00	4.09E+00	5.53E−01	4.29E−02	2.23E−02	1.51E−02	4.51E−03
80.00	4.41E+00	3.45E+00	4.78E−01	3.73E−02	1.98E−02	1.34E−02	3.78E−03
85.00	3.75E+00	2.95E+00	4.21E−01	3.38E−02	1.81E−02	1.21E−02	3.27E−03
90.00	3.25E+00	2.56E+00	3.76E−01	3.15E−02	1.68E−02	1.12E−02	2.93E−03
95.00	2.88E+00	2.27E+00	3.43E−01	3.01E−02	1.60E−02	1.05E−02	2.68E−03
105.00	2.40E+00	1.90E+00	3.03E−01	2.90E−02	1.49E−02	9.68E−03	2.36E−03
120.00	2.08E+00	1.65E+00	2.81E−01	2.94E−02	1.42E−02	9.05E−03	2.11E−03
135.00	2.00E+00	1.59E+00	2.80E−01	3.04E−02	1.40E−02	8.72E−03	1.96E−03
150.00	2.00E+00	1.60E+00	2.86E−01	3.14E−02	1.39E−02	8.52E−03	1.88E−03
165.00	2.03E+00	1.62E+00	2.91E−01	3.20E−02	1.38E−02	8.40E−03	1.83E−03
180.00	2.04E+00	1.63E+00	2.94E−01	3.21E−02	1.38E−02	8.36E−03	1.81E−03
total	1.98E+02	1.60E+02	3.80E+01	8.81E+00	5.30E+00	4.10E+00	2.07E+00
rel ff	2.27E+02	1.71E+02	3.69E+01	8.86E+00	5.41E+00	4.24E+00	2.17E+00
nrl ff	2.40E+02	1.82E+02	4.08E+01	9.93E+00	6.10E+00	4.79E+00	2.47E+00

TABLE 1. Predicted *S*-matrix differential elastic scattering cross sections for photon energies (50.0, 59.54, 145.4, 316.5, 411.8, 468.1, 661.6, 778.9, 964.0, 1004.8, 1112.1, 1274.5, 1408.0 and 1500.0). The angle integrated total cross sections for each element and energies are presented. ''total'' represents total cross sections from this work, ''rel ff'' represents total cross sections calculated from the relativistic form factor and ''nrl ff'' represents total cross sections calculated from the nonrelativistic form factor—Continued[a]

θ (deg)	Photon energy (keV)						
	778.9	964.0	1004.8	1112.1	1274.5	1408.0	1500.0
Polonium ($Z=84$)							
0.00	5.47E+02	5.46E+02	5.46E+02	5.46E+02	5.46E+02	5.45E+02	5.45E+02
0.01	5.46E+02	5.46E+02	5.45E+02	5.45E+02	5.45E+02	5.44E+02	5.44E+02
0.02	5.45E+02	5.45E+02	5.45E+02	5.44E+02	5.43E+02	5.42E+02	5.40E+02
0.04	5.42E+02	5.40E+02	5.39E+02	5.37E+02	5.35E+02	5.32E+02	5.30E+02
0.06	5.37E+02	5.32E+02	5.31E+02	5.27E+02	5.22E+02	5.17E+02	5.14E+02
0.10	5.22E+02	5.11E+02	5.08E+02	5.01E+02	4.90E+02	4.82E+02	4.76E+02
0.20	4.72E+02	4.46E+02	4.41E+02	4.26E+02	4.04E+02	3.88E+02	3.77E+02
0.30	4.20E+02	3.83E+02	3.75E+02	3.55E+02	3.27E+02	3.05E+02	2.91E+02
0.40	3.69E+02	3.25E+02	3.16E+02	2.94E+02	2.64E+02	2.42E+02	2.28E+02
0.50	3.24E+02	2.76E+02	2.67E+02	2.44E+02	2.14E+02	1.94E+02	1.82E+02
0.60	2.84E+02	2.36E+02	2.27E+02	2.05E+02	1.77E+02	1.58E+02	1.47E+02
0.70	2.50E+02	2.03E+02	1.94E+02	1.73E+02	1.47E+02	1.30E+02	1.20E+02
0.80	2.20E+02	1.75E+02	1.67E+02	1.47E+02	1.23E+02	1.07E+02	9.74E+01
1.00	1.74E+02	1.33E+02	1.26E+02	1.09E+02	8.78E+01	7.39E+01	6.57E+01
1.20	1.39E+02	1.03E+02	9.63E+01	8.15E+01	6.35E+01	5.18E+01	4.49E+01
1.50	1.01E+02	7.08E+01	6.56E+01	5.39E+01	4.02E+01	3.17E+01	2.69E+01
1.70	8.26E+01	5.57E+01	5.13E+01	4.15E+01	3.06E+01	2.42E+01	2.07E+01
2.00	6.15E+01	3.96E+01	3.62E+01	2.89E+01	2.15E+01	1.77E+01	1.59E+01
2.50	3.89E+01	2.41E+01	2.20E+01	1.77E+01	1.39E+01	1.24E+01	1.21E+01
3.00	2.63E+01	1.67E+01	1.53E+01	1.26E+01	9.87E+00	8.52E+00	7.89E+00
3.50	1.92E+01	1.28E+01	1.18E+01	9.71E+00	7.11E+00	5.26E+00	4.10E+00
4.00	1.49E+01	1.01E+01	9.38E+00	7.56E+00	5.04E+00	3.18E+00	2.10E+00
5.00	9.61E+00	6.01E+00	5.43E+00	4.13E+00	2.57E+00	1.59E+00	1.06E+00
6.00	6.23E+00	3.33E+00	2.94E+00	2.16E+00	1.50E+00	1.24E+00	1.16E+00
7.00	4.03E+00	2.01E+00	1.76E+00	1.31E+00	1.02E+00	1.03E+00	1.21E+00
8.00	2.71E+00	1.42E+00	1.26E+00	9.65E−01	7.53E−01	7.23E−01	7.77E−01
9.00	1.95E+00	1.13E+00	1.02E+00	8.03E−01	5.73E−01	4.33E−01	3.51E−01
10.00	1.49E+00	9.47E−01	8.66E−01	6.81E−01	4.30E−01	2.50E−01	1.51E−01
12.50	8.88E−01	5.45E−01	4.90E−01	3.60E−01	1.92E−01	9.05E−02	4.54E−02
15.00	5.49E−01	2.69E−01	2.31E−01	1.58E−01	9.08E−02	5.91E−02	4.44E−02
17.50	3.29E−01	1.38E−01	1.16E−01	7.82E−02	5.23E−02	4.78E−02	5.26E−02
20.00	1.99E−01	8.28E−02	7.02E−02	4.87E−02	3.57E−02	3.66E−02	4.45E−02
22.50	1.27E−01	5.77E−02	5.00E−02	3.64E−02	2.68E−02	2.48E−02	2.61E−02
25.00	8.66E−02	4.45E−02	3.94E−02	2.98E−02	2.07E−02	1.56E−02	1.26E−02
27.50	6.32E−02	3.60E−02	3.25E−02	2.50E−02	1.59E−02	9.54E−03	5.96E−03
30.00	4.86E−02	2.93E−02	2.67E−02	2.05E−02	1.19E−02	5.97E−03	3.06E−03
35.00	3.14E−02	1.87E−02	1.68E−02	1.22E−02	6.09E−03	2.53E−03	1.10E−03
40.00	2.14E−02	1.13E−02	9.85E−03	6.56E−03	2.97E−03	1.21E−03	5.43E−04
45.00	1.47E−02	6.75E−03	5.67E−03	3.49E−03	1.49E−03	6.38E−04	3.19E−04
50.00	1.00E−02	4.04E−03	3.30E−03	1.91E−03	7.93E−04	3.64E−04	2.04E−04
55.00	6.90E−03	2.52E−03	2.02E−03	1.13E−03	4.73E−04	2.36E−04	1.49E−04
60.00	4.85E−03	1.66E−03	1.32E−03	7.30E−04	3.21E−04	1.79E−04	1.28E−04
65.00	3.53E−03	1.17E−03	9.25E−04	5.17E−04	2.41E−04	1.48E−04	1.16E−04
70.00	2.68E−03	8.81E−04	7.00E−04	4.00E−04	1.98E−04	1.32E−04	1.12E−04
75.00	2.14E−03	7.10E−04	5.68E−04	3.32E−04	1.74E−04	1.23E−04	1.09E−04
80.00	1.78E−03	6.05E−04	4.88E−04	2.92E−04	1.59E−04	1.16E−04	1.05E−04
85.00	1.55E−03	5.35E−04	4.35E−04	2.65E−04	1.49E−04	1.11E−04	1.01E−04
90.00	1.39E−03	4.91E−04	4.01E−04	2.49E−04	1.43E−04	1.07E−04	9.74E−05
95.00	1.27E−03	4.58E−04	3.76E−04	2.37E−04	1.38E−04	1.04E−04	9.43E−05
105.00	1.13E−03	4.16E−04	3.44E−04	2.21E−04	1.32E−04	1.01E−04	9.06E−05
120.00	1.00E−03	3.80E−04	3.17E−04	2.08E−04	1.28E−04	9.93E−05	8.94E−05
135.00	9.35E−04	3.62E−04	3.04E−04	2.03E−04	1.29E−04	1.01E−04	9.03E−05
150.00	8.95E−04	3.52E−04	2.97E−04	2.01E−04	1.30E−04	1.03E−04	9.23E−05
165.00	8.73E−04	3.47E−04	2.94E−04	2.01E−04	1.32E−04	1.05E−04	9.46E−05
180.00	8.66E−04	3.46E−04	2.93E−04	2.02E−04	1.33E−04	1.06E−04	9.58E−05
total	1.49E+00	9.74E−01	8.97E−01	7.33E−01	5.53E−01	4.50E−01	4.01E−01
rel ff	1.58E+00	1.04E+00	9.63E−01	7.88E−01	6.01E−01	4.95E−01	4.38E−01
nrl ff	1.80E+00	1.19E+00	1.10E+00	8.97E−01	6.85E−01	5.64E−01	4.99E−01

TABLE 1. Predicted *S*-matrix differential elastic scattering cross sections for photon energies (50.0, 59.54, 145.4, 316.5, 411.8, 468.1, 661.6, 778.9, 964.0, 1004.8, 1112.1, 1274.5, 1408.0 and 1500.0). The angle integrated total cross sections for each element and energies are presented. ''total'' represents total cross sections from this work, ''rel ff'' represents total cross sections calculated from the relativistic form factor and ''nrl ff'' represents total cross sections calculated from the nonrelativistic form factor—Continued[a]

θ (deg)	Photon energy (keV)						
	50.0	59.5	145.4	316.5	411.8	468.1	661.6
Astatine ($Z=85$)							
0.00	5.54E+02	5.55E+02	5.62E+02	5.62E+02	5.61E+02	5.61E+02	5.60E+02
0.01	5.54E+02	5.55E+02	5.62E+02	5.62E+02	5.61E+02	5.60E+02	5.59E+02
0.02	5.54E+02	5.55E+02	5.62E+02	5.61E+02	5.60E+02	5.60E+02	5.59E+02
0.04	5.54E+02	5.55E+02	5.62E+02	5.61E+02	5.60E+02	5.59E+02	5.56E+02
0.06	5.54E+02	5.55E+02	5.61E+02	5.60E+02	5.58E+02	5.57E+02	5.53E+02
0.10	5.53E+02	5.55E+02	5.61E+02	5.57E+02	5.53E+02	5.51E+02	5.41E+02
0.20	5.53E+02	5.54E+02	5.58E+02	5.44E+02	5.32E+02	5.25E+02	4.99E+02
0.30	5.53E+02	5.54E+02	5.53E+02	5.25E+02	5.05E+02	4.93E+02	4.52E+02
0.40	5.52E+02	5.52E+02	5.47E+02	5.04E+02	4.77E+02	4.61E+02	4.07E+02
0.50	5.51E+02	5.51E+02	5.39E+02	4.82E+02	4.48E+02	4.28E+02	3.65E+02
0.60	5.50E+02	5.49E+02	5.30E+02	4.60E+02	4.20E+02	3.97E+02	3.26E+02
0.70	5.48E+02	5.47E+02	5.21E+02	4.38E+02	3.93E+02	3.68E+02	2.92E+02
0.80	5.47E+02	5.44E+02	5.11E+02	4.16E+02	3.66E+02	3.40E+02	2.62E+02
1.00	5.43E+02	5.39E+02	4.91E+02	3.75E+02	3.19E+02	2.90E+02	2.13E+02
1.20	5.38E+02	5.33E+02	4.70E+02	3.37E+02	2.78E+02	2.49E+02	1.75E+02
1.50	5.30E+02	5.22E+02	4.40E+02	2.88E+02	2.28E+02	2.01E+02	1.32E+02
1.70	5.24E+02	5.14E+02	4.20E+02	2.60E+02	2.01E+02	1.75E+02	1.11E+02
2.00	5.15E+02	5.03E+02	3.91E+02	2.23E+02	1.68E+02	1.43E+02	8.58E+01
2.50	4.99E+02	4.82E+02	3.46E+02	1.76E+02	1.26E+02	1.04E+02	5.69E+01
3.00	4.83E+02	4.61E+02	3.06E+02	1.41E+02	9.63E+01	7.73E+01	3.88E+01
3.50	4.65E+02	4.40E+02	2.71E+02	1.14E+02	7.42E+01	5.81E+01	2.76E+01
4.00	4.48E+02	4.20E+02	2.41E+02	9.24E+01	5.76E+01	4.44E+01	2.08E+01
5.00	4.12E+02	3.80E+02	1.93E+02	6.23E+01	3.59E+01	2.76E+01	1.37E+01
6.00	3.77E+02	3.43E+02	1.56E+02	4.32E+01	2.41E+01	1.86E+01	9.77E+00
7.00	3.44E+02	3.09E+02	1.27E+02	3.11E+01	1.77E+01	1.36E+01	6.79E+00
8.00	3.13E+02	2.79E+02	1.05E+02	2.34E+01	1.39E+01	1.05E+01	4.61E+00
9.00	2.87E+02	2.53E+02	8.68E+01	1.83E+01	1.12E+01	8.29E+00	3.18E+00
10.00	2.64E+02	2.29E+02	7.22E+01	1.48E+01	9.08E+00	6.55E+00	2.30E+00
12.50	2.18E+02	1.81E+02	4.63E+01	9.42E+00	5.05E+00	3.57E+00	1.33E+00
15.00	1.81E+02	1.44E+02	3.10E+01	6.23E+00	2.85E+00	2.03E+00	9.14E−01
17.50	1.49E+02	1.16E+02	2.20E+01	4.13E+00	1.83E+00	1.31E+00	6.09E−01
20.00	1.21E+02	9.41E+01	1.68E+01	2.79E+00	1.34E+00	9.55E−01	3.87E−01
22.50	9.73E+01	7.66E+01	1.34E+01	1.96E+00	1.05E+00	7.32E−01	2.44E−01
25.00	7.86E+01	6.25E+01	1.10E+01	1.45E+00	8.24E−01	5.61E−01	1.60E−01
27.50	6.41E+01	5.11E+01	9.01E+00	1.13E+00	6.36E−01	4.23E−01	1.10E−01
30.00	5.28E+01	4.20E+01	7.35E+00	9.09E−01	4.81E−01	3.13E−01	8.09E−02
35.00	3.70E+01	2.88E+01	4.75E+00	6.12E−01	2.68E−01	1.72E−01	5.02E−02
40.00	2.69E+01	2.04E+01	3.07E+00	4.11E−01	1.54E−01	9.93E−02	3.48E−02
45.00	2.03E+01	1.51E+01	2.08E+00	2.74E−01	9.63E−02	6.29E−02	2.51E−02
50.00	1.57E+01	1.16E+01	1.51E+00	1.84E−01	6.56E−02	4.36E−02	1.83E−02
55.00	1.24E+01	9.19E+00	1.16E+00	1.27E−01	4.84E−02	3.26E−02	1.34E−02
60.00	9.93E+00	7.46E+00	9.41E−01	9.06E−02	3.79E−02	2.58E−02	9.94E−03
65.00	8.07E+00	6.13E+00	7.83E−01	6.80E−02	3.10E−02	2.11E−02	7.54E−03
70.00	6.62E+00	5.09E+00	6.64E−01	5.37E−02	2.62E−02	1.79E−02	5.89E−03
75.00	5.50E+00	4.27E+00	5.70E−01	4.45E−02	2.28E−02	1.55E−02	4.78E−03
80.00	4.63E+00	3.61E+00	4.95E−01	3.86E−02	2.04E−02	1.38E−02	4.01E−03
85.00	3.96E+00	3.10E+00	4.37E−01	3.48E−02	1.87E−02	1.26E−02	3.49E−03
90.00	3.45E+00	2.71E+00	3.93E−01	3.25E−02	1.74E−02	1.16E−02	3.12E−03
95.00	3.06E+00	2.41E+00	3.60E−01	3.10E−02	1.65E−02	1.10E−02	2.87E−03
105.00	2.56E+00	2.03E+00	3.19E−01	2.99E−02	1.55E−02	1.02E−02	2.54E−03
120.00	2.22E+00	1.77E+00	2.97E−01	3.03E−02	1.49E−02	9.54E−03	2.27E−03
135.00	2.13E+00	1.70E+00	2.98E−01	3.14E−02	1.47E−02	9.23E−03	2.12E−03
150.00	2.13E+00	1.70E+00	3.05E−01	3.24E−02	1.46E−02	9.04E−03	2.02E−03
165.00	2.15E+00	1.72E+00	3.12E−01	3.30E−02	1.45E−02	8.93E−03	1.97E−03
180.00	2.16E+00	1.73E+00	3.14E−01	3.32E−02	1.45E−02	8.89E−03	1.96E−03
total	2.05E+02	1.65E+02	3.91E+01	9.09E+00	5.46E+00	4.23E+00	2.13E+00
rel ff	2.33E+02	1.76E+02	3.80E+01	9.13E+00	5.58E+00	4.37E+00	2.24E+00
nrl ff	2.47E+02	1.88E+02	4.21E+01	1.03E+01	6.32E+00	4.96E+00	2.56E+00

TABLE 1. Predicted *S*-matrix differential elastic scattering cross sections for photon energies (50.0, 59.54, 145.4, 316.5, 411.8, 468.1, 661.6, 778.9, 964.0, 1004.8, 1112.1, 1274.5, 1408.0 and 1500.0). The angle integrated total cross sections for each element and energies are presented. ''total'' represents total cross sections from this work, ''rel ff'' represents total cross sections calculated from the relativistic form factor and ''nrl ff'' represents total cross sections calculated from the nonrelativistic form factor—Continued[a]

θ (deg)	Photon energy (keV)						
	778.9	964.0	1004.8	1112.1	1274.5	1408.0	1500.0
Astatine ($Z=85$)							
0.00	5.60E+02	5.59E+02	5.59E+02	5.59E+02	5.59E+02	5.58E+02	5.58E+02
0.01	5.59E+02	5.58E+02	5.58E+02	5.58E+02	5.57E+02	5.57E+02	5.56E+02
0.02	5.58E+02	5.57E+02	5.57E+02	5.57E+02	5.56E+02	5.54E+02	5.53E+02
0.04	5.55E+02	5.52E+02	5.52E+02	5.50E+02	5.47E+02	5.44E+02	5.41E+02
0.06	5.50E+02	5.44E+02	5.43E+02	5.39E+02	5.33E+02	5.28E+02	5.25E+02
0.10	5.34E+02	5.22E+02	5.19E+02	5.12E+02	5.01E+02	4.91E+02	4.85E+02
0.20	4.82E+02	4.55E+02	4.49E+02	4.34E+02	4.12E+02	3.95E+02	3.84E+02
0.30	4.28E+02	3.90E+02	3.83E+02	3.62E+02	3.33E+02	3.11E+02	2.96E+02
0.40	3.76E+02	3.32E+02	3.23E+02	3.00E+02	2.69E+02	2.47E+02	2.34E+02
0.50	3.30E+02	2.82E+02	2.73E+02	2.49E+02	2.19E+02	1.99E+02	1.87E+02
0.60	2.90E+02	2.41E+02	2.32E+02	2.10E+02	1.81E+02	1.62E+02	1.51E+02
0.70	2.55E+02	2.08E+02	1.99E+02	1.77E+02	1.51E+02	1.33E+02	1.23E+02
0.80	2.26E+02	1.80E+02	1.72E+02	1.52E+02	1.27E+02	1.10E+02	1.00E+02
1.00	1.78E+02	1.37E+02	1.30E+02	1.12E+02	9.06E+01	7.63E+01	6.78E+01
1.20	1.43E+02	1.06E+02	9.93E+01	8.41E+01	6.58E+01	5.38E+01	4.68E+01
1.50	1.04E+02	7.32E+01	6.78E+01	5.58E+01	4.18E+01	3.31E+01	2.82E+01
1.70	8.53E+01	5.78E+01	5.32E+01	4.31E+01	3.18E+01	2.50E+01	2.14E+01
2.00	6.37E+01	4.12E+01	3.76E+01	3.01E+01	2.23E+01	1.81E+01	1.60E+01
2.50	4.04E+01	2.50E+01	2.28E+01	1.83E+01	1.42E+01	1.26E+01	1.22E+01
3.00	2.72E+01	1.71E+01	1.57E+01	1.28E+01	1.01E+01	8.84E+00	8.33E+00
3.50	1.97E+01	1.30E+01	1.20E+01	9.85E+00	7.32E+00	5.59E+00	4.51E+00
4.00	1.52E+01	1.04E+01	9.57E+00	7.74E+00	5.24E+00	3.39E+00	2.30E+00
5.00	9.86E+00	6.27E+00	5.69E+00	4.35E+00	2.69E+00	1.63E+00	1.06E+00
6.00	6.46E+00	3.52E+00	3.11E+00	2.29E+00	1.56E+00	1.23E+00	1.10E+00
7.00	4.21E+00	2.10E+00	1.84E+00	1.36E+00	1.05E+00	1.05E+00	1.21E+00
8.00	2.83E+00	1.46E+00	1.29E+00	9.83E−01	7.72E−01	7.61E−01	8.44E−01
9.00	2.02E+00	1.15E+00	1.04E+00	8.09E−01	5.89E−01	4.68E−01	4.01E−01
10.00	1.54E+00	9.63E−01	8.79E−01	6.91E−01	4.46E−01	2.71E−01	1.72E−01
12.50	9.13E−01	5.70E−01	5.14E−01	3.80E−01	2.03E−01	9.44E−02	4.63E−02
15.00	5.70E−01	2.86E−01	2.47E−01	1.69E−01	9.57E−02	5.94E−02	4.23E−02
17.50	3.45E−01	1.46E−01	1.23E−01	8.27E−02	5.42E−02	4.79E−02	5.08E−02
20.00	2.09E−01	8.65E−02	7.31E−02	5.03E−02	3.65E−02	3.73E−02	4.55E−02
22.50	1.33E−01	5.93E−02	5.12E−02	3.69E−02	2.72E−02	2.59E−02	2.82E−02
25.00	9.04E−02	4.53E−02	4.00E−02	3.00E−02	2.11E−02	1.65E−02	1.41E−02
27.50	6.55E−02	3.65E−02	3.28E−02	2.52E−02	1.63E−02	1.02E−02	6.68E−03
30.00	5.00E−02	2.99E−02	2.71E−02	2.08E−02	1.23E−02	6.38E−03	3.39E−03
35.00	3.22E−02	1.93E−02	1.73E−02	1.27E−02	6.43E−03	2.70E−03	1.18E−03
40.00	2.19E−02	1.19E−02	1.03E−02	6.96E−03	3.19E−03	1.29E−03	5.72E−04
45.00	1.51E−02	7.12E−03	6.01E−03	3.74E−03	1.62E−03	6.86E−04	3.37E−04
50.00	1.04E−02	4.30E−03	3.52E−03	2.06E−03	8.65E−04	3.94E−04	2.18E−04
55.00	7.23E−03	2.70E−03	2.17E−03	1.22E−03	5.17E−04	2.57E−04	1.60E−04
60.00	5.11E−03	1.78E−03	1.42E−03	7.94E−04	3.51E−04	1.95E−04	1.38E−04
65.00	3.74E−03	1.26E−03	1.00E−03	5.63E−04	2.63E−04	1.61E−04	1.26E−04
70.00	2.86E−03	9.53E−04	7.60E−04	4.35E−04	2.16E−04	1.44E−04	1.21E−04
75.00	2.29E−03	7.70E−04	6.17E−04	3.62E−04	1.90E−04	1.34E−04	1.18E−04
80.00	1.91E−03	6.56E−04	5.30E−04	3.18E−04	1.73E−04	1.26E−04	1.13E−04
85.00	1.66E−03	5.81E−04	4.73E−04	2.89E−04	1.62E−04	1.20E−04	1.09E−04
90.00	1.49E−03	5.33E−04	4.36E−04	2.71E−04	1.55E−04	1.16E−04	1.05E−04
95.00	1.37E−03	4.97E−04	4.09E−04	2.57E−04	1.49E−04	1.12E−04	1.01E−04
105.00	1.22E−03	4.52E−04	3.74E−04	2.40E−04	1.43E−04	1.08E−04	9.71E−05
120.00	1.09E−03	4.12E−04	3.44E−04	2.25E−04	1.38E−04	1.06E−04	9.54E−05
135.00	1.01E−03	3.92E−04	3.29E−04	2.20E−04	1.38E−04	1.07E−04	9.59E−05
150.00	9.69E−04	3.81E−04	3.21E−04	2.17E−04	1.39E−04	1.09E−04	9.78E−05
165.00	9.46E−04	3.75E−04	3.17E−04	2.16E−04	1.41E−04	1.11E−04	1.00E−04
180.00	9.38E−04	3.74E−04	3.17E−04	2.17E−04	1.42E−04	1.12E−04	1.01E−04
total	1.54E+00	1.00E+00	9.26E−01	7.56E−01	5.71E−01	4.65E−01	4.13E−01
rel ff	1.64E+00	1.08E+00	9.94E−01	8.13E−01	6.21E−01	5.11E−01	4.52E−01
nrl ff	1.87E+00	1.23E+00	1.14E+00	9.30E−01	7.10E−01	5.85E−01	5.18E−01

TABLE 1. Predicted *S*-matrix differential elastic scattering cross sections for photon energies (50.0, 59.54, 145.4, 316.5, 411.8, 468.1, 661.6, 778.9, 964.0, 1004.8, 1112.1, 1274.5, 1408.0 and 1500.0). The angle integrated total cross sections for each element and energies are presented. ''total'' represents total cross sections from this work, ''rel ff'' represents total cross sections calculated from the relativistic form factor and ''nrl ff'' represents total cross sections calculated from the nonrelativistic form factor—Continued[a]

θ (deg)	Photon energy (keV)						
	50.0	59.5	145.4	316.5	411.8	468.1	661.6
Radon ($Z=86$)							
0.00	5.68E+02	5.69E+02	5.75E+02	5.75E+02	5.74E+02	5.74E+02	5.73E+02
0.01	5.68E+02	5.69E+02	5.74E+02	5.75E+02	5.74E+02	5.73E+02	5.72E+02
0.02	5.67E+02	5.69E+02	5.74E+02	5.75E+02	5.73E+02	5.73E+02	5.72E+02
0.04	5.67E+02	5.68E+02	5.74E+02	5.74E+02	5.73E+02	5.72E+02	5.69E+02
0.06	5.67E+02	5.68E+02	5.74E+02	5.73E+02	5.71E+02	5.70E+02	5.65E+02
0.10	5.67E+02	5.68E+02	5.74E+02	5.70E+02	5.66E+02	5.63E+02	5.53E+02
0.20	5.67E+02	5.68E+02	5.70E+02	5.56E+02	5.44E+02	5.36E+02	5.09E+02
0.30	5.66E+02	5.67E+02	5.65E+02	5.37E+02	5.16E+02	5.04E+02	4.61E+02
0.40	5.65E+02	5.66E+02	5.58E+02	5.15E+02	4.87E+02	4.70E+02	4.15E+02
0.50	5.65E+02	5.64E+02	5.50E+02	4.92E+02	4.57E+02	4.37E+02	3.72E+02
0.60	5.64E+02	5.62E+02	5.41E+02	4.69E+02	4.28E+02	4.05E+02	3.33E+02
0.70	5.62E+02	5.60E+02	5.31E+02	4.47E+02	4.00E+02	3.75E+02	2.98E+02
0.80	5.60E+02	5.57E+02	5.21E+02	4.25E+02	3.74E+02	3.46E+02	2.67E+02
1.00	5.57E+02	5.52E+02	5.00E+02	3.83E+02	3.25E+02	2.96E+02	2.18E+02
1.20	5.52E+02	5.45E+02	4.80E+02	3.44E+02	2.84E+02	2.55E+02	1.79E+02
1.50	5.43E+02	5.34E+02	4.48E+02	2.94E+02	2.34E+02	2.05E+02	1.36E+02
1.70	5.37E+02	5.26E+02	4.28E+02	2.65E+02	2.06E+02	1.79E+02	1.14E+02
2.00	5.27E+02	5.14E+02	3.98E+02	2.29E+02	1.72E+02	1.47E+02	8.84E+01
2.50	5.10E+02	4.92E+02	3.52E+02	1.81E+02	1.30E+02	1.08E+02	5.90E+01
3.00	4.93E+02	4.71E+02	3.11E+02	1.45E+02	9.92E+01	7.99E+01	4.03E+01
3.50	4.76E+02	4.50E+02	2.76E+02	1.17E+02	7.66E+01	6.02E+01	2.86E+01
4.00	4.58E+02	4.28E+02	2.46E+02	9.53E+01	5.97E+01	4.61E+01	2.15E+01
5.00	4.21E+02	3.88E+02	1.97E+02	6.44E+01	3.74E+01	2.86E+01	1.40E+01
6.00	3.85E+02	3.50E+02	1.60E+02	4.48E+01	2.50E+01	1.92E+01	1.00E+01
7.00	3.51E+02	3.16E+02	1.31E+02	3.23E+01	1.82E+01	1.40E+01	7.06E+00
8.00	3.20E+02	2.85E+02	1.08E+02	2.42E+01	1.42E+01	1.08E+01	4.83E+00
9.00	2.93E+02	2.59E+02	8.93E+01	1.88E+01	1.15E+01	8.51E+00	3.33E+00
10.00	2.70E+02	2.35E+02	7.44E+01	1.52E+01	9.34E+00	6.76E+00	2.40E+00
12.50	2.23E+02	1.86E+02	4.80E+01	9.67E+00	5.28E+00	3.73E+00	1.37E+00
15.00	1.86E+02	1.49E+02	3.21E+01	6.44E+00	2.98E+00	2.12E+00	9.39E−01
17.50	1.54E+02	1.20E+02	2.27E+01	4.30E+00	1.89E+00	1.36E+00	6.33E−01
20.00	1.25E+02	9.72E+01	1.71E+01	2.91E+00	1.37E+00	9.80E−01	4.07E−01
22.50	1.01E+02	7.92E+01	1.36E+01	2.04E+00	1.07E+00	7.51E−01	2.58E−01
25.00	8.20E+01	6.48E+01	1.12E+01	1.51E+00	8.48E−01	5.80E−01	1.68E−01
27.50	6.69E+01	5.32E+01	9.21E+00	1.17E+00	6.60E−01	4.40E−01	1.16E−01
30.00	5.52E+01	4.38E+01	7.55E+00	9.35E−01	5.03E−01	3.28E−01	8.42E−02
35.00	3.86E+01	3.01E+01	4.93E+00	6.31E−01	2.83E−01	1.81E−01	5.16E−02
40.00	2.81E+01	2.13E+01	3.19E+00	4.28E−01	1.63E−01	1.04E−01	3.56E−02
45.00	2.11E+01	1.56E+01	2.15E+00	2.87E−01	1.01E−01	6.56E−02	2.57E−02
50.00	1.62E+01	1.20E+01	1.55E+00	1.93E−01	6.82E−02	4.51E−02	1.88E−02
55.00	1.28E+01	9.47E+00	1.19E+00	1.33E−01	4.99E−02	3.35E−02	1.39E−02
60.00	1.03E+01	7.68E+00	9.59E−01	9.51E−02	3.88E−02	2.64E−02	1.04E−02
65.00	8.36E+00	6.33E+00	7.98E−01	7.12E−02	3.17E−02	2.16E−02	7.89E−03
70.00	6.89E+00	5.27E+00	6.78E−01	5.60E−02	2.68E−02	1.83E−02	6.20E−03
75.00	5.75E+00	4.44E+00	5.84E−01	4.63E−02	2.34E−02	1.60E−02	5.04E−03
80.00	4.86E+00	3.78E+00	5.10E−01	4.00E−02	2.10E−02	1.43E−02	4.25E−03
85.00	4.17E+00	3.26E+00	4.52E−01	3.60E−02	1.92E−02	1.30E−02	3.71E−03
90.00	3.65E+00	2.86E+00	4.08E−01	3.35E−02	1.80E−02	1.21E−02	3.33E−03
95.00	3.25E+00	2.56E+00	3.74E−01	3.20E−02	1.71E−02	1.14E−02	3.06E−03
105.00	2.73E+00	2.16E+00	3.34E−01	3.08E−02	1.61E−02	1.06E−02	2.72E−03
120.00	2.38E+00	1.89E+00	3.13E−01	3.12E−02	1.56E−02	1.01E−02	2.44E−03
135.00	2.27E+00	1.81E+00	3.14E−01	3.24E−02	1.54E−02	9.76E−03	2.28E−03
150.00	2.26E+00	1.81E+00	3.23E−01	3.35E−02	1.54E−02	9.58E−03	2.18E−03
165.00	2.28E+00	1.83E+00	3.30E−01	3.42E−02	1.53E−02	9.47E−03	2.13E−03
180.00	2.29E+00	1.84E+00	3.33E−01	3.44E−02	1.53E−02	9.44E−03	2.11E−03
total	2.13E+02	1.71E+02	4.02E+01	9.38E+00	5.64E+00	4.37E+00	2.20E+00
rel ff	2.40E+02	1.82E+02	3.92E+01	9.41E+00	5.75E+00	4.51E+00	2.31E+00
nrl ff	2.55E+02	1.94E+02	4.35E+01	1.06E+01	6.54E+00	5.13E+00	2.65E+00

TABLE 1. Predicted *S*-matrix differential elastic scattering cross sections for photon energies (50.0, 59.54, 145.4, 316.5, 411.8, 468.1, 661.6, 778.9, 964.0, 1004.8, 1112.1, 1274.5, 1408.0 and 1500.0). The angle integrated total cross sections for each element and energies are presented. ''total'' represents total cross sections from this work, ''rel ff'' represents total cross sections calculated from the relativistic form factor and ''nrl ff'' represents total cross sections calculated from the nonrelativistic form factor—Continued[a]

θ (deg)	Photon energy (keV)						
	778.9	964.0	1004.8	1112.1	1274.5	1408.0	1500.0
Radon ($Z=86$)							
0.00	5.73E+02	5.72E+02	5.72E+02	5.72E+02	5.72E+02	5.71E+02	5.71E+02
0.01	5.72E+02	5.71E+02	5.71E+02	5.71E+02	5.70E+02	5.70E+02	5.69E+02
0.02	5.71E+02	5.70E+02	5.70E+02	5.70E+02	5.68E+02	5.67E+02	5.65E+02
0.04	5.68E+02	5.65E+02	5.64E+02	5.62E+02	5.59E+02	5.56E+02	5.54E+02
0.06	5.62E+02	5.56E+02	5.55E+02	5.51E+02	5.45E+02	5.40E+02	5.36E+02
0.10	5.45E+02	5.33E+02	5.30E+02	5.23E+02	5.11E+02	5.02E+02	4.95E+02
0.20	4.92E+02	4.64E+02	4.58E+02	4.43E+02	4.20E+02	4.03E+02	3.92E+02
0.30	4.36E+02	3.98E+02	3.90E+02	3.69E+02	3.40E+02	3.17E+02	3.02E+02
0.40	3.84E+02	3.38E+02	3.29E+02	3.06E+02	2.75E+02	2.53E+02	2.39E+02
0.50	3.37E+02	2.88E+02	2.78E+02	2.55E+02	2.25E+02	2.04E+02	1.92E+02
0.60	2.96E+02	2.47E+02	2.37E+02	2.15E+02	1.86E+02	1.66E+02	1.55E+02
0.70	2.61E+02	2.13E+02	2.04E+02	1.82E+02	1.55E+02	1.37E+02	1.26E+02
0.80	2.31E+02	1.85E+02	1.76E+02	1.56E+02	1.30E+02	1.13E+02	1.03E+02
1.00	1.83E+02	1.41E+02	1.33E+02	1.15E+02	9.34E+01	7.87E+01	7.00E+01
1.20	1.47E+02	1.09E+02	1.02E+02	8.67E+01	6.80E+01	5.59E+01	4.88E+01
1.50	1.07E+02	7.56E+01	7.01E+01	5.78E+01	4.34E+01	3.45E+01	2.94E+01
1.70	8.80E+01	5.98E+01	5.52E+01	4.47E+01	3.30E+01	2.60E+01	2.21E+01
2.00	6.59E+01	4.28E+01	3.92E+01	3.13E+01	2.30E+01	1.85E+01	1.62E+01
2.50	4.19E+01	2.60E+01	2.36E+01	1.89E+01	1.46E+01	1.28E+01	1.22E+01
3.00	2.82E+01	1.76E+01	1.61E+01	1.31E+01	1.03E+01	9.15E+00	8.75E+00
3.50	2.03E+01	1.32E+01	1.22E+01	1.00E+01	7.53E+00	5.92E+00	4.93E+00
4.00	1.56E+01	1.06E+01	9.76E+00	7.91E+00	5.44E+00	3.61E+00	2.51E+00
5.00	1.01E+01	6.54E+00	5.95E+00	4.57E+00	2.82E+00	1.67E+00	1.06E+00
6.00	6.70E+00	3.71E+00	3.28E+00	2.43E+00	1.62E+00	1.23E+00	1.05E+00
7.00	4.39E+00	2.20E+00	1.92E+00	1.42E+00	1.08E+00	1.06E+00	1.20E+00
8.00	2.96E+00	1.50E+00	1.32E+00	1.00E+00	7.91E−01	7.97E−01	9.08E−01
9.00	2.10E+00	1.17E+00	1.05E+00	8.18E−01	6.05E−01	5.03E−01	4.54E−01
10.00	1.59E+00	9.79E−01	8.93E−01	7.01E−01	4.63E−01	2.94E−01	1.96E−01
12.50	9.39E−01	5.94E−01	5.38E−01	4.01E−01	2.15E−01	9.88E−02	4.77E−02
15.00	5.92E−01	3.03E−01	2.63E−01	1.81E−01	1.01E−01	6.00E−02	4.06E−02
17.50	3.62E−01	1.55E−01	1.31E−01	8.76E−02	5.63E−02	4.80E−02	4.91E−02
20.00	2.20E−01	9.05E−02	7.63E−02	5.22E−02	3.74E−02	3.80E−02	4.63E−02
22.50	1.40E−01	6.11E−02	5.25E−02	3.75E−02	2.77E−02	2.70E−02	3.02E−02
25.00	9.44E−02	4.62E−02	4.06E−02	3.02E−02	2.14E−02	1.74E−02	1.56E−02
27.50	6.79E−02	3.71E−02	3.33E−02	2.54E−02	1.67E−02	1.09E−02	7.45E−03
30.00	5.16E−02	3.04E−02	2.76E−02	2.12E−02	1.27E−02	6.81E−03	3.75E−03
35.00	3.30E−02	1.99E−02	1.79E−02	1.32E−02	6.78E−03	2.87E−03	1.26E−03
40.00	2.25E−02	1.24E−02	1.08E−02	7.37E−03	3.41E−03	1.38E−03	6.04E−04
45.00	1.56E−02	7.50E−03	6.36E−03	4.01E−03	1.75E−03	7.37E−04	3.57E−04
50.00	1.08E−02	4.56E−03	3.76E−03	2.22E−03	9.41E−04	4.26E−04	2.32E−04
55.00	7.56E−03	2.88E−03	2.33E−03	1.33E−03	5.64E−04	2.79E−04	1.72E−04
60.00	5.39E−03	1.92E−03	1.53E−03	8.63E−04	3.84E−04	2.12E−04	1.48E−04
65.00	3.96E−03	1.36E−03	1.08E−03	6.13E−04	2.88E−04	1.75E−04	1.36E−04
70.00	3.04E−03	1.03E−03	8.23E−04	4.74E−04	2.36E−04	1.56E−04	1.31E−04
75.00	2.44E−03	8.33E−04	6.70E−04	3.94E−04	2.07E−04	1.45E−04	1.27E−04
80.00	2.05E−03	7.11E−04	5.75E−04	3.46E−04	1.88E−04	1.36E−04	1.22E−04
85.00	1.79E−03	6.30E−04	5.13E−04	3.14E−04	1.76E−04	1.30E−04	1.18E−04
90.00	1.61E−03	5.78E−04	4.73E−04	2.94E−04	1.68E−04	1.25E−04	1.13E−04
95.00	1.48E−03	5.40E−04	4.44E−04	2.79E−04	1.62E−04	1.21E−04	1.09E−04
105.00	1.31E−03	4.90E−04	4.06E−04	2.60E−04	1.55E−04	1.17E−04	1.04E−04
120.00	1.17E−03	4.47E−04	3.72E−04	2.44E−04	1.49E−04	1.14E−04	1.02E−04
135.00	1.10E−03	4.25E−04	3.56E−04	2.37E−04	1.48E−04	1.14E−04	1.02E−04
150.00	1.05E−03	4.12E−04	3.47E−04	2.34E−04	1.49E−04	1.16E−04	1.04E−04
165.00	1.02E−03	4.06E−04	3.43E−04	2.33E−04	1.50E−04	1.18E−04	1.06E−04
180.00	1.02E−03	4.04E−04	3.42E−04	2.33E−04	1.51E−04	1.19E−04	1.07E−04
total	1.58E+00	1.04E+00	9.55E−01	7.80E−01	5.89E−01	4.80E−01	4.27E−01
rel ff	1.69E+00	1.11E+00	1.03E+00	8.40E−01	6.41E−01	5.28E−01	4.67E−01
nrl ff	1.93E+00	1.28E+00	1.18E+00	9.65E−01	7.37E−01	6.07E−01	5.37E−01

TABLE 1. Predicted *S*-matrix differential elastic scattering cross sections for photon energies (50.0, 59.54, 145.4, 316.5, 411.8, 468.1, 661.6, 778.9, 964.0, 1004.8, 1112.1, 1274.5, 1408.0 and 1500.0). The angle integrated total cross sections for each element and energies are presented. ''total'' represents total cross sections from this work, ''rel ff'' represents total cross sections calculated from the relativistic form factor and ''nrl ff'' represents total cross sections calculated from the nonrelativistic form factor—Continued[a]

θ (deg)	Photon energy (keV)						
	50.0	59.5	145.4	316.5	411.8	468.1	661.6
Francium ($Z=87$)							
0.00	5.81E+02	5.82E+02	5.87E+02	5.88E+02	5.87E+02	5.87E+02	5.86E+02
0.01	5.81E+02	5.82E+02	5.87E+02	5.88E+02	5.87E+02	5.86E+02	5.85E+02
0.02	5.81E+02	5.82E+02	5.87E+02	5.88E+02	5.87E+02	5.86E+02	5.85E+02
0.04	5.81E+02	5.82E+02	5.87E+02	5.87E+02	5.86E+02	5.85E+02	5.82E+02
0.06	5.81E+02	5.82E+02	5.87E+02	5.86E+02	5.84E+02	5.83E+02	5.78E+02
0.10	5.81E+02	5.82E+02	5.86E+02	5.83E+02	5.78E+02	5.76E+02	5.65E+02
0.20	5.81E+02	5.82E+02	5.83E+02	5.69E+02	5.56E+02	5.48E+02	5.20E+02
0.30	5.80E+02	5.81E+02	5.77E+02	5.48E+02	5.27E+02	5.14E+02	4.70E+02
0.40	5.79E+02	5.79E+02	5.70E+02	5.26E+02	4.97E+02	4.80E+02	4.24E+02
0.50	5.78E+02	5.78E+02	5.62E+02	5.02E+02	4.66E+02	4.46E+02	3.79E+02
0.60	5.77E+02	5.76E+02	5.52E+02	4.79E+02	4.37E+02	4.13E+02	3.39E+02
0.70	5.76E+02	5.73E+02	5.42E+02	4.56E+02	4.08E+02	3.82E+02	3.04E+02
0.80	5.74E+02	5.71E+02	5.32E+02	4.33E+02	3.81E+02	3.53E+02	2.73E+02
1.00	5.70E+02	5.65E+02	5.10E+02	3.90E+02	3.32E+02	3.03E+02	2.23E+02
1.20	5.65E+02	5.58E+02	4.89E+02	3.51E+02	2.90E+02	2.60E+02	1.84E+02
1.50	5.55E+02	5.46E+02	4.57E+02	3.00E+02	2.39E+02	2.10E+02	1.40E+02
1.70	5.49E+02	5.38E+02	4.36E+02	2.71E+02	2.11E+02	1.84E+02	1.17E+02
2.00	5.39E+02	5.25E+02	4.06E+02	2.34E+02	1.77E+02	1.51E+02	9.11E+01
2.50	5.22E+02	5.03E+02	3.59E+02	1.85E+02	1.33E+02	1.11E+02	6.11E+01
3.00	5.05E+02	4.81E+02	3.18E+02	1.49E+02	1.02E+02	8.24E+01	4.19E+01
3.50	4.86E+02	4.59E+02	2.82E+02	1.20E+02	7.91E+01	6.22E+01	2.97E+01
4.00	4.68E+02	4.38E+02	2.51E+02	9.82E+01	6.18E+01	4.77E+01	2.21E+01
5.00	4.30E+02	3.96E+02	2.02E+02	6.66E+01	3.88E+01	2.96E+01	1.43E+01
6.00	3.93E+02	3.58E+02	1.64E+02	4.64E+01	2.58E+01	1.99E+01	1.03E+01
7.00	3.59E+02	3.23E+02	1.34E+02	3.35E+01	1.87E+01	1.44E+01	7.32E+00
8.00	3.28E+02	2.92E+02	1.11E+02	2.50E+01	1.45E+01	1.10E+01	5.04E+00
9.00	3.00E+02	2.65E+02	9.18E+01	1.94E+01	1.18E+01	8.73E+00	3.48E+00
10.00	2.76E+02	2.40E+02	7.66E+01	1.56E+01	9.61E+00	6.97E+00	2.50E+00
12.50	2.29E+02	1.91E+02	4.97E+01	9.92E+00	5.51E+00	3.89E+00	1.40E+00
15.00	1.91E+02	1.53E+02	3.32E+01	6.65E+00	3.11E+00	2.21E+00	9.64E−01
17.50	1.58E+02	1.23E+02	2.33E+01	4.47E+00	1.96E+00	1.40E+00	6.58E−01
20.00	1.30E+02	1.00E+02	1.75E+01	3.03E+00	1.41E+00	1.01E+00	4.27E−01
22.50	1.05E+02	8.19E+01	1.39E+01	2.12E+00	1.10E+00	7.71E−01	2.72E−01
25.00	8.54E+01	6.71E+01	1.14E+01	1.56E+00	8.72E−01	5.99E−01	1.77E−01
27.50	6.98E+01	5.52E+01	9.39E+00	1.20E+00	6.84E−01	4.57E−01	1.21E−01
30.00	5.76E+01	4.56E+01	7.74E+00	9.62E−01	5.25E−01	3.44E−01	8.77E−02
35.00	4.04E+01	3.14E+01	5.10E+00	6.50E−01	2.98E−01	1.91E−01	5.31E−02
40.00	2.93E+01	2.22E+01	3.31E+00	4.44E−01	1.72E−01	1.10E−01	3.65E−02
45.00	2.19E+01	1.62E+01	2.23E+00	3.00E−01	1.06E−01	6.85E−02	2.64E−02
50.00	1.68E+01	1.24E+01	1.59E+00	2.03E−01	7.09E−02	4.67E−02	1.94E−02
55.00	1.32E+01	9.75E+00	1.21E+00	1.40E−01	5.15E−02	3.45E−02	1.43E−02
60.00	1.06E+01	7.90E+00	9.75E−01	9.98E−02	3.99E−02	2.70E−02	1.08E−02
65.00	8.67E+00	6.52E+00	8.11E−01	7.45E−02	3.25E−02	2.22E−02	8.25E−03
70.00	7.17E+00	5.45E+00	6.90E−01	5.84E−02	2.75E−02	1.88E−02	6.51E−03
75.00	6.00E+00	4.61E+00	5.96E−01	4.81E−02	2.40E−02	1.64E−02	5.32E−03
80.00	5.10E+00	3.94E+00	5.22E−01	4.15E−02	2.16E−02	1.47E−02	4.50E−03
85.00	4.39E+00	3.42E+00	4.64E−01	3.73E−02	1.98E−02	1.34E−02	3.94E−03
90.00	3.86E+00	3.01E+00	4.20E−01	3.46E−02	1.86E−02	1.25E−02	3.54E−03
95.00	3.45E+00	2.70E+00	3.87E−01	3.30E−02	1.77E−02	1.19E−02	3.27E−03
105.00	2.91E+00	2.29E+00	3.47E−01	3.18E−02	1.68E−02	1.11E−02	2.91E−03
120.00	2.54E+00	2.01E+00	3.27E−01	3.22E−02	1.63E−02	1.06E−02	2.62E−03
135.00	2.42E+00	1.93E+00	3.29E−01	3.35E−02	1.62E−02	1.03E−02	2.45E−03
150.00	2.41E+00	1.93E+00	3.39E−01	3.46E−02	1.61E−02	1.01E−02	2.35E−03
165.00	2.43E+00	1.95E+00	3.47E−01	3.53E−02	1.61E−02	1.00E−02	2.29E−03
180.00	2.43E+00	1.96E+00	3.50E−01	3.56E−02	1.61E−02	1.00E−02	2.27E−03
total	2.20E+02	1.77E+02	4.13E+01	9.67E+00	5.81E+00	4.51E+00	2.27E+00
rel ff	2.47E+02	1.87E+02	4.03E+01	9.70E+00	5.93E+00	4.65E+00	2.39E+00
nrl ff	2.63E+02	2.00E+02	4.50E+01	1.10E+01	6.76E+00	5.31E+00	2.74E+00

TABLE 1. Predicted *S*-matrix differential elastic scattering cross sections for photon energies (50.0, 59.54, 145.4, 316.5, 411.8, 468.1, 661.6, 778.9, 964.0, 1004.8, 1112.1, 1274.5, 1408.0 and 1500.0). The angle integrated total cross sections for each element and energies are presented. ''total'' represents total cross sections from this work, ''rel ff'' represents total cross sections calculated from the relativistic form factor and ''nrl ff'' represents total cross sections calculated from the nonrelativistic form factor—Continued[a]

θ (deg)	Photon energy (keV)						
	778.9	964.0	1004.8	1112.1	1274.5	1408.0	1500.0
Francium ($Z=87$)							
0.00	5.86E+02	5.85E+02	5.85E+02	5.85E+02	5.85E+02	5.84E+02	5.84E+02
0.01	5.85E+02	5.84E+02	5.84E+02	5.84E+02	5.83E+02	5.83E+02	5.82E+02
0.02	5.84E+02	5.83E+02	5.83E+02	5.83E+02	5.81E+02	5.80E+02	5.78E+02
0.04	5.80E+02	5.78E+02	5.77E+02	5.75E+02	5.72E+02	5.68E+02	5.66E+02
0.06	5.75E+02	5.69E+02	5.67E+02	5.63E+02	5.57E+02	5.52E+02	5.48E+02
0.10	5.57E+02	5.44E+02	5.42E+02	5.34E+02	5.22E+02	5.12E+02	5.06E+02
0.20	5.02E+02	4.74E+02	4.68E+02	4.52E+02	4.29E+02	4.11E+02	4.00E+02
0.30	4.45E+02	4.06E+02	3.98E+02	3.77E+02	3.47E+02	3.24E+02	3.08E+02
0.40	3.92E+02	3.45E+02	3.36E+02	3.12E+02	2.81E+02	2.58E+02	2.44E+02
0.50	3.43E+02	2.94E+02	2.84E+02	2.61E+02	2.30E+02	2.09E+02	1.97E+02
0.60	3.02E+02	2.52E+02	2.43E+02	2.20E+02	1.90E+02	1.71E+02	1.59E+02
0.70	2.66E+02	2.18E+02	2.09E+02	1.87E+02	1.59E+02	1.40E+02	1.29E+02
0.80	2.36E+02	1.89E+02	1.81E+02	1.60E+02	1.34E+02	1.16E+02	1.05E+02
1.00	1.88E+02	1.45E+02	1.37E+02	1.19E+02	9.63E+01	8.12E+01	7.23E+01
1.20	1.51E+02	1.12E+02	1.05E+02	8.94E+01	7.03E+01	5.79E+01	5.07E+01
1.50	1.11E+02	7.80E+01	7.24E+01	5.97E+01	4.50E+01	3.59E+01	3.07E+01
1.70	9.07E+01	6.19E+01	5.71E+01	4.64E+01	3.43E+01	2.69E+01	2.29E+01
2.00	6.82E+01	4.45E+01	4.07E+01	3.25E+01	2.38E+01	1.89E+01	1.64E+01
2.50	4.35E+01	2.69E+01	2.45E+01	1.96E+01	1.50E+01	1.30E+01	1.23E+01
3.00	2.92E+01	1.80E+01	1.65E+01	1.34E+01	1.06E+01	9.45E+00	9.16E+00
3.50	2.10E+01	1.35E+01	1.24E+01	1.02E+01	7.74E+00	6.25E+00	5.36E+00
4.00	1.60E+01	1.08E+01	9.96E+00	8.09E+00	5.64E+00	3.83E+00	2.73E+00
5.00	1.04E+01	6.79E+00	6.19E+00	4.79E+00	2.95E+00	1.72E+00	1.07E+00
6.00	6.93E+00	3.90E+00	3.46E+00	2.56E+00	1.69E+00	1.23E+00	1.01E+00
7.00	4.57E+00	2.30E+00	2.01E+00	1.48E+00	1.11E+00	1.07E+00	1.19E+00
8.00	3.08E+00	1.55E+00	1.36E+00	1.03E+00	8.12E−01	8.31E−01	9.68E−01
9.00	2.18E+00	1.19E+00	1.07E+00	8.28E−01	6.22E−01	5.38E−01	5.10E−01
10.00	1.64E+00	9.97E−01	9.07E−01	7.12E−01	4.79E−01	3.17E−01	2.21E−01
12.50	9.66E−01	6.18E−01	5.61E−01	4.21E−01	2.27E−01	1.04E−01	4.95E−02
15.00	6.14E−01	3.21E−01	2.79E−01	1.93E−01	1.06E−01	6.08E−02	3.92E−02
17.50	3.79E−01	1.64E−01	1.39E−01	9.27E−02	5.86E−02	4.82E−02	4.75E−02
20.00	2.32E−01	9.47E−02	7.97E−02	5.42E−02	3.84E−02	3.87E−02	4.68E−02
22.50	1.47E−01	6.31E−02	5.40E−02	3.83E−02	2.83E−02	2.80E−02	3.22E−02
25.00	9.86E−02	4.72E−02	4.13E−02	3.05E−02	2.19E−02	1.84E−02	1.71E−02
27.50	7.05E−02	3.78E−02	3.37E−02	2.57E−02	1.71E−02	1.15E−02	8.27E−03
30.00	5.33E−02	3.10E−02	2.80E−02	2.15E−02	1.31E−02	7.25E−03	4.14E−03
35.00	3.38E−02	2.05E−02	1.85E−02	1.37E−02	7.12E−03	3.06E−03	1.36E−03
40.00	2.31E−02	1.29E−02	1.13E−02	7.78E−03	3.64E−03	1.47E−03	6.40E−04
45.00	1.61E−02	7.89E−03	6.72E−03	4.29E−03	1.89E−03	7.91E−04	3.78E−04
50.00	1.12E−02	4.84E−03	4.00E−03	2.40E−03	1.02E−03	4.60E−04	2.48E−04
55.00	7.90E−03	3.07E−03	2.49E−03	1.43E−03	6.15E−04	3.03E−04	1.85E−04
60.00	5.66E−03	2.05E−03	1.65E−03	9.37E−04	4.19E−04	2.31E−04	1.60E−04
65.00	4.19E−03	1.46E−03	1.17E−03	6.66E−04	3.14E−04	1.91E−04	1.46E−04
70.00	3.23E−03	1.11E−03	8.90E−04	5.16E−04	2.57E−04	1.70E−04	1.41E−04
75.00	2.61E−03	9.01E−04	7.26E−04	4.29E−04	2.25E−04	1.57E−04	1.37E−04
80.00	2.19E−03	7.69E−04	6.23E−04	3.76E−04	2.04E−04	1.48E−04	1.32E−04
85.00	1.92E−03	6.83E−04	5.57E−04	3.41E−04	1.91E−04	1.41E−04	1.27E−04
90.00	1.73E−03	6.26E−04	5.13E−04	3.20E−04	1.82E−04	1.35E−04	1.22E−04
95.00	1.59E−03	5.85E−04	4.82E−04	3.03E−04	1.76E−04	1.31E−04	1.17E−04
105.00	1.42E−03	5.32E−04	4.40E−04	2.82E−04	1.67E−04	1.25E−04	1.12E−04
120.00	1.27E−03	4.84E−04	4.04E−04	2.64E−04	1.60E−04	1.22E−04	1.09E−04
135.00	1.19E−03	4.60E−04	3.86E−04	2.56E−04	1.59E−04	1.22E−04	1.09E−04
150.00	1.13E−03	4.45E−04	3.75E−04	2.52E−04	1.59E−04	1.24E−04	1.10E−04
165.00	1.11E−03	4.39E−04	3.70E−04	2.51E−04	1.61E−04	1.26E−04	1.13E−04
180.00	1.10E−03	4.37E−04	3.69E−04	2.51E−04	1.62E−04	1.27E−04	1.14E−04
total	1.63E+00	1.07E+00	9.86E−01	8.05E−01	6.08E−01	4.95E−01	4.40E−01
rel ff	1.74E+00	1.15E+00	1.06E+00	8.66E−01	6.61E−01	5.45E−01	4.82E−01
nrl ff	2.00E+00	1.32E+00	1.22E+00	9.99E−01	7.63E−01	6.29E−01	5.57E−01

TABLE 1. Predicted *S*-matrix differential elastic scattering cross sections for photon energies (50.0, 59.54, 145.4, 316.5, 411.8, 468.1, 661.6, 778.9, 964.0, 1004.8, 1112.1, 1274.5, 1408.0 and 1500.0). The angle integrated total cross sections for each element and energies are presented. ''total'' represents total cross sections from this work, ''rel ff'' represents total cross sections calculated from the relativistic form factor and ''nrl ff'' represents total cross sections calculated from the nonrelativistic form factor—Continued[a]

θ (deg)	Photon energy (keV)						
	50.0	59.5	145.4	316.5	411.8	468.1	661.6
Radium ($Z=88$)							
0.00	5.95E+02	5.96E+02	6.00E+02	6.02E+02	6.01E+02	6.00E+02	5.99E+02
0.01	5.96E+02	5.96E+02	6.00E+02	6.01E+02	6.00E+02	6.00E+02	5.99E+02
0.02	5.95E+02	5.96E+02	6.00E+02	6.01E+02	6.00E+02	5.99E+02	5.98E+02
0.04	5.95E+02	5.96E+02	5.99E+02	6.01E+02	5.99E+02	5.98E+02	5.95E+02
0.06	5.95E+02	5.96E+02	5.99E+02	6.00E+02	5.97E+02	5.96E+02	5.91E+02
0.10	5.95E+02	5.96E+02	5.99E+02	5.96E+02	5.91E+02	5.88E+02	5.77E+02
0.20	5.95E+02	5.95E+02	5.95E+02	5.81E+02	5.68E+02	5.60E+02	5.31E+02
0.30	5.94E+02	5.94E+02	5.89E+02	5.60E+02	5.38E+02	5.25E+02	4.80E+02
0.40	5.93E+02	5.93E+02	5.82E+02	5.37E+02	5.07E+02	4.90E+02	4.32E+02
0.50	5.92E+02	5.91E+02	5.74E+02	5.13E+02	4.76E+02	4.55E+02	3.87E+02
0.60	5.91E+02	5.89E+02	5.64E+02	4.89E+02	4.46E+02	4.22E+02	3.46E+02
0.70	5.89E+02	5.87E+02	5.53E+02	4.65E+02	4.17E+02	3.90E+02	3.11E+02
0.80	5.88E+02	5.84E+02	5.42E+02	4.42E+02	3.89E+02	3.61E+02	2.79E+02
1.00	5.84E+02	5.78E+02	5.20E+02	3.98E+02	3.39E+02	3.09E+02	2.28E+02
1.20	5.78E+02	5.71E+02	4.98E+02	3.58E+02	2.96E+02	2.66E+02	1.89E+02
1.50	5.69E+02	5.58E+02	4.66E+02	3.07E+02	2.44E+02	2.15E+02	1.43E+02
1.70	5.62E+02	5.50E+02	4.44E+02	2.77E+02	2.16E+02	1.88E+02	1.20E+02
2.00	5.51E+02	5.37E+02	4.14E+02	2.39E+02	1.81E+02	1.55E+02	9.39E+01
2.50	5.34E+02	5.14E+02	3.66E+02	1.90E+02	1.37E+02	1.14E+02	6.32E+01
3.00	5.16E+02	4.92E+02	3.24E+02	1.53E+02	1.05E+02	8.50E+01	4.35E+01
3.50	4.97E+02	4.69E+02	2.88E+02	1.24E+02	8.16E+01	6.43E+01	3.08E+01
4.00	4.78E+02	4.47E+02	2.57E+02	1.01E+02	6.40E+01	4.94E+01	2.28E+01
5.00	4.40E+02	4.05E+02	2.06E+02	6.88E+01	4.03E+01	3.07E+01	1.46E+01
6.00	4.02E+02	3.66E+02	1.68E+02	4.81E+01	2.67E+01	2.05E+01	1.05E+01
7.00	3.67E+02	3.30E+02	1.37E+02	3.47E+01	1.92E+01	1.48E+01	7.57E+00
8.00	3.35E+02	2.99E+02	1.13E+02	2.59E+01	1.48E+01	1.13E+01	5.26E+00
9.00	3.07E+02	2.71E+02	9.43E+01	2.00E+01	1.20E+01	8.95E+00	3.64E+00
10.00	2.83E+02	2.46E+02	7.88E+01	1.60E+01	9.87E+00	7.18E+00	2.60E+00
12.50	2.34E+02	1.96E+02	5.13E+01	1.02E+01	5.74E+00	4.05E+00	1.44E+00
15.00	1.96E+02	1.57E+02	3.43E+01	6.86E+00	3.25E+00	2.31E+00	9.89E−01
17.50	1.63E+02	1.27E+02	2.40E+01	4.63E+00	2.03E+00	1.45E+00	6.82E−01
20.00	1.34E+02	1.03E+02	1.79E+01	3.15E+00	1.45E+00	1.03E+00	4.47E−01
22.50	1.09E+02	8.46E+01	1.41E+01	2.21E+00	1.12E+00	7.92E−01	2.87E−01
25.00	8.88E+01	6.95E+01	1.15E+01	1.62E+00	8.97E−01	6.17E−01	1.87E−01
27.50	7.27E+01	5.73E+01	9.56E+00	1.24E+00	7.07E−01	4.75E−01	1.27E−01
30.00	6.01E+01	4.74E+01	7.91E+00	9.90E−01	5.46E−01	3.59E−01	9.14E−02
35.00	4.21E+01	3.27E+01	5.26E+00	6.70E−01	3.13E−01	2.00E−01	5.47E−02
40.00	3.05E+01	2.31E+01	3.43E+00	4.60E−01	1.81E−01	1.15E−01	3.74E−02
45.00	2.28E+01	1.69E+01	2.30E+00	3.13E−01	1.11E−01	7.16E−02	2.70E−02
50.00	1.74E+01	1.28E+01	1.63E+00	2.12E−01	7.38E−02	4.85E−02	1.99E−02
55.00	1.37E+01	1.01E+01	1.24E+00	1.47E−01	5.32E−02	3.55E−02	1.48E−02
60.00	1.10E+01	8.14E+00	9.89E−01	1.05E−01	4.11E−02	2.77E−02	1.12E−02
65.00	8.99E+00	6.72E+00	8.21E−01	7.80E−02	3.34E−02	2.27E−02	8.61E−03
70.00	7.45E+00	5.64E+00	6.99E−01	6.10E−02	2.82E−02	1.93E−02	6.82E−03
75.00	6.27E+00	4.78E+00	6.05E−01	5.01E−02	2.46E−02	1.69E−02	5.60E−03
80.00	5.34E+00	4.11E+00	5.32E−01	4.31E−02	2.22E−02	1.51E−02	4.75E−03
85.00	4.62E+00	3.58E+00	4.75E−01	3.86E−02	2.04E−02	1.39E−02	4.17E−03
90.00	4.07E+00	3.16E+00	4.31E−01	3.58E−02	1.92E−02	1.30E−02	3.77E−03
95.00	3.65E+00	2.85E+00	3.98E−01	3.41E−02	1.83E−02	1.24E−02	3.48E−03
105.00	3.10E+00	2.43E+00	3.59E−01	3.28E−02	1.74E−02	1.16E−02	3.11E−03
120.00	2.71E+00	2.14E+00	3.39E−01	3.32E−02	1.70E−02	1.11E−02	2.80E−03
135.00	2.58E+00	2.05E+00	3.43E−01	3.46E−02	1.69E−02	1.09E−02	2.63E−03
150.00	2.57E+00	2.05E+00	3.53E−01	3.58E−02	1.69E−02	1.07E−02	2.52E−03
165.00	2.58E+00	2.07E+00	3.61E−01	3.65E−02	1.69E−02	1.06E−02	2.46E−03
180.00	2.59E+00	2.07E+00	3.65E−01	3.68E−02	1.69E−02	1.06E−02	2.44E−03
total	2.28E+02	1.83E+02	4.24E+01	9.96E+00	5.99E+00	4.65E+00	2.34E+00
rel ff	2.54E+02	1.92E+02	4.15E+01	9.99E+00	6.11E+00	4.79E+00	2.46E+00
nrl ff	2.71E+02	2.06E+02	4.64E+01	1.14E+01	6.99E+00	5.49E+00	2.84E+00

TABLE 1. Predicted *S*-matrix differential elastic scattering cross sections for photon energies (50.0, 59.54, 145.4, 316.5, 411.8, 468.1, 661.6, 778.9, 964.0, 1004.8, 1112.1, 1274.5, 1408.0 and 1500.0). The angle integrated total cross sections for each element and energies are presented. ''total'' represents total cross sections from this work, ''rel ff'' represents total cross sections calculated from the relativistic form factor and ''nrl ff'' represents total cross sections calculated from the nonrelativistic form factor—Continued[a]

θ (deg)	Photon energy (keV)						
	778.9	964.0	1004.8	1112.1	1274.5	1408.0	1500.0
Radium ($Z=88$)							
0.00	5.99E+02	5.99E+02	5.99E+02	5.98E+02	5.98E+02	5.97E+02	5.97E+02
0.01	5.98E+02	5.98E+02	5.98E+02	5.97E+02	5.97E+02	5.96E+02	5.95E+02
0.02	5.97E+02	5.97E+02	5.96E+02	5.96E+02	5.94E+02	5.93E+02	5.91E+02
0.04	5.93E+02	5.90E+02	5.90E+02	5.88E+02	5.84E+02	5.81E+02	5.78E+02
0.06	5.87E+02	5.81E+02	5.80E+02	5.76E+02	5.69E+02	5.64E+02	5.60E+02
0.10	5.70E+02	5.56E+02	5.53E+02	5.45E+02	5.33E+02	5.23E+02	5.16E+02
0.20	5.12E+02	4.84E+02	4.77E+02	4.61E+02	4.38E+02	4.20E+02	4.08E+02
0.30	4.54E+02	4.15E+02	4.06E+02	3.85E+02	3.54E+02	3.30E+02	3.15E+02
0.40	4.00E+02	3.52E+02	3.43E+02	3.19E+02	2.87E+02	2.64E+02	2.50E+02
0.50	3.51E+02	3.00E+02	2.90E+02	2.66E+02	2.35E+02	2.14E+02	2.02E+02
0.60	3.08E+02	2.58E+02	2.48E+02	2.25E+02	1.95E+02	1.75E+02	1.63E+02
0.70	2.72E+02	2.23E+02	2.14E+02	1.91E+02	1.63E+02	1.44E+02	1.33E+02
0.80	2.42E+02	1.94E+02	1.85E+02	1.64E+02	1.38E+02	1.19E+02	1.08E+02
1.00	1.92E+02	1.49E+02	1.41E+02	1.22E+02	9.91E+01	8.37E+01	7.45E+01
1.20	1.55E+02	1.15E+02	1.08E+02	9.20E+01	7.26E+01	6.00E+01	5.27E+01
1.50	1.14E+02	8.04E+01	7.47E+01	6.17E+01	4.67E+01	3.73E+01	3.20E+01
1.70	9.34E+01	6.40E+01	5.91E+01	4.81E+01	3.55E+01	2.79E+01	2.37E+01
2.00	7.05E+01	4.62E+01	4.23E+01	3.38E+01	2.47E+01	1.94E+01	1.67E+01
2.50	4.51E+01	2.80E+01	2.54E+01	2.03E+01	1.54E+01	1.32E+01	1.23E+01
3.00	3.02E+01	1.86E+01	1.69E+01	1.37E+01	1.08E+01	9.74E+00	9.53E+00
3.50	2.16E+01	1.38E+01	1.27E+01	1.03E+01	7.95E+00	6.57E+00	5.79E+00
4.00	1.64E+01	1.10E+01	1.02E+01	8.26E+00	5.84E+00	4.06E+00	2.96E+00
5.00	1.07E+01	7.04E+00	6.44E+00	5.00E+00	3.08E+00	1.78E+00	1.09E+00
6.00	7.16E+00	4.09E+00	3.64E+00	2.70E+00	1.75E+00	1.24E+00	9.78E−01
7.00	4.76E+00	2.40E+00	2.10E+00	1.55E+00	1.15E+00	1.08E+00	1.18E+00
8.00	3.21E+00	1.60E+00	1.40E+00	1.05E+00	8.34E−01	8.63E−01	1.02E+00
9.00	2.27E+00	1.22E+00	1.09E+00	8.40E−01	6.39E−01	5.73E−01	5.66E−01
10.00	1.70E+00	1.02E+00	9.22E−01	7.23E−01	4.95E−01	3.41E−01	2.49E−01
12.50	9.93E−01	6.42E−01	5.84E−01	4.41E−01	2.39E−01	1.09E−01	5.17E−02
15.00	6.36E−01	3.39E−01	2.96E−01	2.06E−01	1.12E−01	6.18E−02	3.82E−02
17.50	3.96E−01	1.74E−01	1.47E−01	9.83E−02	6.10E−02	4.85E−02	4.60E−02
20.00	2.44E−01	9.93E−02	8.34E−02	5.64E−02	3.95E−02	3.93E−02	4.71E−02
22.50	1.54E−01	6.53E−02	5.57E−02	3.91E−02	2.88E−02	2.89E−02	3.40E−02
25.00	1.03E−01	4.83E−02	4.21E−02	3.09E−02	2.23E−02	1.93E−02	1.87E−02
27.50	7.33E−02	3.85E−02	3.43E−02	2.59E−02	1.75E−02	1.22E−02	9.14E−03
30.00	5.50E−02	3.16E−02	2.85E−02	2.18E−02	1.35E−02	7.72E−03	4.57E−03
35.00	3.47E−02	2.10E−02	1.90E−02	1.41E−02	7.47E−03	3.26E−03	1.46E−03
40.00	2.37E−02	1.34E−02	1.18E−02	8.20E−03	3.88E−03	1.57E−03	6.79E−04
45.00	1.66E−02	8.28E−03	7.09E−03	4.57E−03	2.03E−03	8.48E−04	4.00E−04
50.00	1.16E−02	5.12E−03	4.26E−03	2.58E−03	1.11E−03	4.96E−04	2.64E−04
55.00	8.24E−03	3.27E−03	2.67E−03	1.55E−03	6.70E−04	3.29E−04	1.98E−04
60.00	5.94E−03	2.20E−03	1.77E−03	1.02E−03	4.57E−04	2.50E−04	1.72E−04
65.00	4.42E−03	1.57E−03	1.26E−03	7.23E−04	3.42E−04	2.07E−04	1.57E−04
70.00	3.42E−03	1.20E−03	9.62E−04	5.61E−04	2.81E−04	1.84E−04	1.52E−04
75.00	2.77E−03	9.73E−04	7.86E−04	4.67E−04	2.45E−04	1.70E−04	1.47E−04
80.00	2.34E−03	8.32E−04	6.75E−04	4.09E−04	2.22E−04	1.60E−04	1.42E−04
85.00	2.05E−03	7.39E−04	6.03E−04	3.71E−04	2.08E−04	1.52E−04	1.36E−04
90.00	1.85E−03	6.78E−04	5.56E−04	3.47E−04	1.98E−04	1.46E−04	1.31E−04
95.00	1.71E−03	6.34E−04	5.22E−04	3.29E−04	1.90E−04	1.41E−04	1.26E−04
105.00	1.53E−03	5.76E−04	4.77E−04	3.06E−04	1.81E−04	1.35E−04	1.20E−04
120.00	1.37E−03	5.24E−04	4.37E−04	2.85E−04	1.73E−04	1.31E−04	1.16E−04
135.00	1.28E−03	4.98E−04	4.17E−04	2.76E−04	1.71E−04	1.31E−04	1.16E−04
150.00	1.22E−03	4.82E−04	4.05E−04	2.72E−04	1.71E−04	1.32E−04	1.17E−04
165.00	1.20E−03	4.74E−04	4.00E−04	2.70E−04	1.72E−04	1.34E−04	1.19E−04
180.00	1.19E−03	4.72E−04	3.98E−04	2.70E−04	1.73E−04	1.35E−04	1.21E−04
total	1.69E+00	1.10E+00	1.02E+00	8.30E−01	6.27E−01	5.11E−01	4.54E−01
rel ff	1.79E+00	1.18E+00	1.09E+00	8.94E−01	6.82E−01	5.62E−01	4.97E−01
nrl ff	2.07E+00	1.37E+00	1.26E+00	1.04E+00	7.91E−01	6.52E−01	5.77E−01

TABLE 1. Predicted *S*-matrix differential elastic scattering cross sections for photon energies (50.0, 59.54, 145.4, 316.5, 411.8, 468.1, 661.6, 778.9, 964.0, 1004.8, 1112.1, 1274.5, 1408.0 and 1500.0). The angle integrated total cross sections for each element and energies are presented. ''total'' represents total cross sections from this work, ''rel ff'' represents total cross sections calculated from the relativistic form factor and ''nrl ff'' represents total cross sections calculated from the nonrelativistic form factor—Continued[a]

θ (deg)	Photon energy (keV)						
	50.0	59.5	145.4	316.5	411.8	468.1	661.6
Actinium ($Z=89$)							
0.00	6.10E+02	6.10E+02	6.12E+02	6.15E+02	6.14E+02	6.14E+02	6.13E+02
0.01	6.10E+02	6.10E+02	6.12E+02	6.15E+02	6.14E+02	6.13E+02	6.12E+02
0.02	6.10E+02	6.10E+02	6.12E+02	6.15E+02	6.13E+02	6.13E+02	6.11E+02
0.04	6.10E+02	6.10E+02	6.12E+02	6.14E+02	6.13E+02	6.12E+02	6.09E+02
0.06	6.10E+02	6.10E+02	6.12E+02	6.13E+02	6.10E+02	6.09E+02	6.04E+02
0.10	6.09E+02	6.10E+02	6.11E+02	6.09E+02	6.04E+02	6.01E+02	5.90E+02
0.20	6.09E+02	6.09E+02	6.08E+02	5.94E+02	5.80E+02	5.72E+02	5.42E+02
0.30	6.09E+02	6.08E+02	6.02E+02	5.72E+02	5.49E+02	5.36E+02	4.90E+02
0.40	6.07E+02	6.07E+02	5.94E+02	5.48E+02	5.18E+02	5.00E+02	4.41E+02
0.50	6.06E+02	6.05E+02	5.86E+02	5.24E+02	4.86E+02	4.65E+02	3.95E+02
0.60	6.05E+02	6.03E+02	5.75E+02	4.99E+02	4.55E+02	4.31E+02	3.54E+02
0.70	6.03E+02	6.00E+02	5.64E+02	4.75E+02	4.26E+02	3.98E+02	3.17E+02
0.80	6.02E+02	5.97E+02	5.53E+02	4.51E+02	3.97E+02	3.68E+02	2.86E+02
1.00	5.97E+02	5.91E+02	5.31E+02	4.07E+02	3.46E+02	3.16E+02	2.34E+02
1.20	5.92E+02	5.84E+02	5.08E+02	3.66E+02	3.03E+02	2.72E+02	1.93E+02
1.50	5.82E+02	5.71E+02	4.75E+02	3.13E+02	2.50E+02	2.20E+02	1.47E+02
1.70	5.75E+02	5.62E+02	4.53E+02	2.83E+02	2.21E+02	1.93E+02	1.24E+02
2.00	5.64E+02	5.49E+02	4.22E+02	2.45E+02	1.86E+02	1.59E+02	9.66E+01
2.50	5.46E+02	5.26E+02	3.73E+02	1.95E+02	1.41E+02	1.17E+02	6.53E+01
3.00	5.28E+02	5.03E+02	3.30E+02	1.57E+02	1.08E+02	8.75E+01	4.51E+01
3.50	5.09E+02	4.80E+02	2.94E+02	1.27E+02	8.40E+01	6.64E+01	3.19E+01
4.00	4.89E+02	4.57E+02	2.62E+02	1.04E+02	6.61E+01	5.11E+01	2.36E+01
5.00	4.50E+02	4.14E+02	2.11E+02	7.10E+01	4.18E+01	3.18E+01	1.50E+01
6.00	4.11E+02	3.74E+02	1.72E+02	4.97E+01	2.77E+01	2.12E+01	1.08E+01
7.00	3.76E+02	3.38E+02	1.41E+02	3.59E+01	1.97E+01	1.52E+01	7.83E+00
8.00	3.43E+02	3.06E+02	1.16E+02	2.68E+01	1.52E+01	1.16E+01	5.48E+00
9.00	3.15E+02	2.77E+02	9.67E+01	2.07E+01	1.23E+01	9.18E+00	3.80E+00
10.00	2.90E+02	2.52E+02	8.10E+01	1.65E+01	1.01E+01	7.39E+00	2.71E+00
12.50	2.40E+02	2.01E+02	5.29E+01	1.04E+01	5.97E+00	4.22E+00	1.48E+00
15.00	2.01E+02	1.61E+02	3.54E+01	7.07E+00	3.39E+00	2.41E+00	1.01E+00
17.50	1.68E+02	1.31E+02	2.47E+01	4.80E+00	2.10E+00	1.50E+00	7.06E−01
20.00	1.38E+02	1.06E+02	1.83E+01	3.28E+00	1.49E+00	1.06E+00	4.68E−01
22.50	1.13E+02	8.72E+01	1.43E+01	2.29E+00	1.15E+00	8.13E−01	3.02E−01
25.00	9.23E+01	7.18E+01	1.17E+01	1.67E+00	9.21E−01	6.36E−01	1.97E−01
27.50	7.57E+01	5.94E+01	9.72E+00	1.28E+00	7.30E−01	4.92E−01	1.33E−01
30.00	6.26E+01	4.92E+01	8.07E+00	1.02E+00	5.68E−01	3.74E−01	9.54E−02
35.00	4.40E+01	3.41E+01	5.40E+00	6.90E−01	3.29E−01	2.11E−01	5.65E−02
40.00	3.18E+01	2.41E+01	3.54E+00	4.77E−01	1.90E−01	1.21E−01	3.83E−02
45.00	2.37E+01	1.75E+01	2.36E+00	3.26E−01	1.16E−01	7.48E−02	2.77E−02
50.00	1.81E+01	1.32E+01	1.67E+00	2.22E−01	7.69E−02	5.03E−02	2.04E−02
55.00	1.42E+01	1.04E+01	1.26E+00	1.54E−01	5.51E−02	3.66E−02	1.53E−02
60.00	1.14E+01	8.38E+00	1.00E+00	1.10E−01	4.23E−02	2.85E−02	1.16E−02
65.00	9.33E+00	6.93E+00	8.28E−01	8.17E−02	3.43E−02	2.33E−02	8.97E−03
70.00	7.75E+00	5.82E+00	7.05E−01	6.37E−02	2.89E−02	1.98E−02	7.14E−03
75.00	6.54E+00	4.95E+00	6.12E−01	5.22E−02	2.53E−02	1.73E−02	5.89E−03
80.00	5.59E+00	4.27E+00	5.39E−01	4.48E−02	2.28E−02	1.56E−02	5.02E−03
85.00	4.86E+00	3.73E+00	4.83E−01	4.00E−02	2.10E−02	1.43E−02	4.41E−03
90.00	4.29E+00	3.31E+00	4.40E−01	3.70E−02	1.98E−02	1.35E−02	4.00E−03
95.00	3.86E+00	2.99E+00	4.08E−01	3.53E−02	1.90E−02	1.29E−02	3.70E−03
105.00	3.29E+00	2.57E+00	3.69E−01	3.38E−02	1.81E−02	1.21E−02	3.31E−03
120.00	2.89E+00	2.27E+00	3.50E−01	3.43E−02	1.77E−02	1.16E−02	3.00E−03
135.00	2.75E+00	2.18E+00	3.54E−01	3.57E−02	1.77E−02	1.14E−02	2.82E−03
150.00	2.73E+00	2.17E+00	3.65E−01	3.70E−02	1.77E−02	1.13E−02	2.71E−03
165.00	2.75E+00	2.19E+00	3.74E−01	3.78E−02	1.77E−02	1.12E−02	2.65E−03
180.00	2.75E+00	2.20E+00	3.77E−01	3.81E−02	1.77E−02	1.12E−02	2.63E−03
total	2.37E+02	1.89E+02	4.34E+01	1.03E+01	6.18E+00	4.79E+00	2.42E+00
rel ff	2.61E+02	1.98E+02	4.27E+01	1.03E+01	6.29E+00	4.93E+00	2.54E+00
nrl ff	2.79E+02	2.12E+02	4.79E+01	1.17E+01	7.23E+00	5.68E+00	2.94E+00

TABLE 1. Predicted *S*-matrix differential elastic scattering cross sections for photon energies (50.0, 59.54, 145.4, 316.5, 411.8, 468.1, 661.6, 778.9, 964.0, 1004.8, 1112.1, 1274.5, 1408.0 and 1500.0). The angle integrated total cross sections for each element and energies are presented. ''total'' represents total cross sections from this work, ''rel ff'' represents total cross sections calculated from the relativistic form factor and ''nrl ff'' represents total cross sections calculated from the nonrelativistic form factor—Continued[a]

θ (deg)	Photon energy (keV)						
	778.9	964.0	1004.8	1112.1	1274.5	1408.0	1500.0
Actinium ($Z=89$)							
0.00	6.12E+02	6.12E+02	6.12E+02	6.12E+02	6.11E+02	6.11E+02	6.10E+02
0.01	6.12E+02	6.11E+02	6.11E+02	6.11E+02	6.10E+02	6.09E+02	6.08E+02
0.02	6.11E+02	6.10E+02	6.10E+02	6.09E+02	6.08E+02	6.06E+02	6.04E+02
0.04	6.07E+02	6.04E+02	6.03E+02	6.01E+02	5.97E+02	5.94E+02	5.91E+02
0.06	6.00E+02	5.94E+02	5.93E+02	5.88E+02	5.82E+02	5.76E+02	5.72E+02
0.10	5.82E+02	5.68E+02	5.65E+02	5.57E+02	5.44E+02	5.34E+02	5.27E+02
0.20	5.23E+02	4.94E+02	4.87E+02	4.71E+02	4.47E+02	4.28E+02	4.17E+02
0.30	4.64E+02	4.23E+02	4.15E+02	3.93E+02	3.61E+02	3.37E+02	3.22E+02
0.40	4.08E+02	3.60E+02	3.50E+02	3.26E+02	2.93E+02	2.70E+02	2.56E+02
0.50	3.58E+02	3.07E+02	2.97E+02	2.72E+02	2.41E+02	2.19E+02	2.07E+02
0.60	3.15E+02	2.64E+02	2.54E+02	2.30E+02	2.00E+02	1.79E+02	1.67E+02
0.70	2.78E+02	2.28E+02	2.19E+02	1.96E+02	1.67E+02	1.48E+02	1.36E+02
0.80	2.47E+02	1.99E+02	1.90E+02	1.68E+02	1.41E+02	1.22E+02	1.11E+02
1.00	1.97E+02	1.52E+02	1.44E+02	1.25E+02	1.02E+02	8.62E+01	7.68E+01
1.20	1.59E+02	1.18E+02	1.11E+02	9.47E+01	7.48E+01	6.21E+01	5.47E+01
1.50	1.17E+02	8.28E+01	7.70E+01	6.38E+01	4.84E+01	3.88E+01	3.33E+01
1.70	9.62E+01	6.61E+01	6.11E+01	4.98E+01	3.69E+01	2.89E+01	2.45E+01
2.00	7.27E+01	4.79E+01	4.39E+01	3.51E+01	2.55E+01	1.99E+01	1.70E+01
2.50	4.67E+01	2.90E+01	2.64E+01	2.10E+01	1.58E+01	1.34E+01	1.24E+01
3.00	3.13E+01	1.91E+01	1.74E+01	1.40E+01	1.11E+01	1.00E+01	9.88E+00
3.50	2.23E+01	1.41E+01	1.29E+01	1.05E+01	8.16E+00	6.89E+00	6.22E+00
4.00	1.69E+01	1.12E+01	1.04E+01	8.44E+00	6.03E+00	4.29E+00	3.21E+00
5.00	1.09E+01	7.29E+00	6.68E+00	5.21E+00	3.21E+00	1.84E+00	1.11E+00
6.00	7.40E+00	4.29E+00	3.82E+00	2.84E+00	1.82E+00	1.25E+00	9.50E−01
7.00	4.95E+00	2.51E+00	2.20E+00	1.62E+00	1.18E+00	1.10E+00	1.16E+00
8.00	3.34E+00	1.65E+00	1.45E+00	1.08E+00	8.57E−01	8.94E−01	1.07E+00
9.00	2.35E+00	1.25E+00	1.11E+00	8.53E−01	6.57E−01	6.07E−01	6.23E−01
10.00	1.75E+00	1.03E+00	9.37E−01	7.34E−01	5.11E−01	3.66E−01	2.79E−01
12.50	1.02E+00	6.65E−01	6.06E−01	4.60E−01	2.51E−01	1.15E−01	5.45E−02
15.00	6.58E−01	3.58E−01	3.14E−01	2.19E−01	1.18E−01	6.30E−02	3.75E−02
17.50	4.14E−01	1.84E−01	1.56E−01	1.04E−01	6.36E−02	4.88E−02	4.46E−02
20.00	2.56E−01	1.04E−01	8.75E−02	5.88E−02	4.07E−02	3.99E−02	4.73E−02
22.50	1.62E−01	6.77E−02	5.75E−02	4.01E−02	2.95E−02	2.99E−02	3.56E−02
25.00	1.08E−01	4.96E−02	4.31E−02	3.14E−02	2.27E−02	2.02E−02	2.03E−02
27.50	7.62E−02	3.93E−02	3.48E−02	2.62E−02	1.79E−02	1.29E−02	1.01E−02
30.00	5.69E−02	3.22E−02	2.90E−02	2.22E−02	1.39E−02	8.20E−03	5.04E−03
35.00	3.57E−02	2.16E−02	1.95E−02	1.46E−02	7.82E−03	3.47E−03	1.58E−03
40.00	2.43E−02	1.39E−02	1.23E−02	8.61E−03	4.12E−03	1.67E−03	7.23E−04
45.00	1.71E−02	8.67E−03	7.46E−03	4.86E−03	2.19E−03	9.09E−04	4.24E−04
50.00	1.20E−02	5.41E−03	4.52E−03	2.77E−03	1.20E−03	5.35E−04	2.81E−04
55.00	8.58E−03	3.48E−03	2.85E−03	1.67E−03	7.29E−04	3.56E−04	2.12E−04
60.00	6.23E−03	2.35E−03	1.90E−03	1.10E−03	4.98E−04	2.71E−04	1.84E−04
65.00	4.66E−03	1.68E−03	1.36E−03	7.85E−04	3.73E−04	2.24E−04	1.69E−04
70.00	3.63E−03	1.29E−03	1.04E−03	6.09E−04	3.06E−04	2.00E−04	1.63E−04
75.00	2.95E−03	1.05E−03	8.50E−04	5.07E−04	2.67E−04	1.84E−04	1.58E−04
80.00	2.50E−03	8.98E−04	7.31E−04	4.44E−04	2.42E−04	1.73E−04	1.52E−04
85.00	2.19E−03	7.99E−04	6.54E−04	4.03E−04	2.25E−04	1.65E−04	1.46E−04
90.00	1.98E−03	7.34E−04	6.03E−04	3.77E−04	2.15E−04	1.58E−04	1.41E−04
95.00	1.83E−03	6.86E−04	5.66E−04	3.57E−04	2.06E−04	1.53E−04	1.35E−04
105.00	1.64E−03	6.24E−04	5.17E−04	3.32E−04	1.95E−04	1.45E−04	1.29E−04
120.00	1.47E−03	5.68E−04	4.73E−04	3.09E−04	1.86E−04	1.40E−04	1.24E−04
135.00	1.38E−03	5.39E−04	4.52E−04	2.99E−04	1.84E−04	1.40E−04	1.23E−04
150.00	1.32E−03	5.21E−04	4.38E−04	2.93E−04	1.83E−04	1.41E−04	1.25E−04
165.00	1.29E−03	5.12E−04	4.32E−04	2.91E−04	1.84E−04	1.43E−04	1.27E−04
180.00	1.28E−03	5.10E−04	4.30E−04	2.91E−04	1.85E−04	1.44E−04	1.28E−04
total	1.74E+00	1.14E+00	1.05E+00	8.56E−01	6.46E−01	5.27E−01	4.69E−01
rel ff	1.85E+00	1.22E+00	1.13E+00	9.21E−01	7.03E−01	5.80E−01	5.13E−01
nrl ff	2.15E+00	1.42E+00	1.31E+00	1.07E+00	8.19E−01	6.75E−01	5.98E−01

TABLE 1. Predicted *S*-matrix differential elastic scattering cross sections for photon energies (50.0, 59.54, 145.4, 316.5, 411.8, 468.1, 661.6, 778.9, 964.0, 1004.8, 1112.1, 1274.5, 1408.0 and 1500.0). The angle integrated total cross sections for each element and energies are presented. ''total'' represents total cross sections from this work, ''rel ff'' represents total cross sections calculated from the relativistic form factor and ''nrl ff'' represents total cross sections calculated from the nonrelativistic form factor—Continued[a]

θ (deg)	Photon energy (keV)						
	50.0	59.5	145.4	316.5	411.8	468.1	661.6
Thorium ($Z=90$)							
0.00	6.24E+02	6.24E+02	6.25E+02	6.29E+02	6.28E+02	6.27E+02	6.26E+02
0.01	6.24E+02	6.24E+02	6.25E+02	6.28E+02	6.27E+02	6.27E+02	6.26E+02
0.02	6.24E+02	6.24E+02	6.25E+02	6.28E+02	6.27E+02	6.26E+02	6.25E+02
0.04	6.24E+02	6.24E+02	6.25E+02	6.28E+02	6.26E+02	6.25E+02	6.22E+02
0.06	6.24E+02	6.24E+02	6.24E+02	6.27E+02	6.24E+02	6.23E+02	6.17E+02
0.10	6.24E+02	6.24E+02	6.24E+02	6.23E+02	6.18E+02	6.15E+02	6.03E+02
0.20	6.23E+02	6.23E+02	6.20E+02	6.07E+02	5.93E+02	5.84E+02	5.54E+02
0.30	6.23E+02	6.22E+02	6.14E+02	5.85E+02	5.61E+02	5.48E+02	5.01E+02
0.40	6.22E+02	6.21E+02	6.06E+02	5.60E+02	5.29E+02	5.11E+02	4.51E+02
0.50	6.21E+02	6.19E+02	5.97E+02	5.35E+02	4.96E+02	4.75E+02	4.04E+02
0.60	6.19E+02	6.17E+02	5.87E+02	5.10E+02	4.65E+02	4.40E+02	3.62E+02
0.70	6.17E+02	6.14E+02	5.76E+02	4.85E+02	4.35E+02	4.07E+02	3.24E+02
0.80	6.16E+02	6.11E+02	5.64E+02	4.61E+02	4.06E+02	3.76E+02	2.92E+02
1.00	6.11E+02	6.05E+02	5.41E+02	4.16E+02	3.54E+02	3.23E+02	2.39E+02
1.20	6.06E+02	5.97E+02	5.18E+02	3.74E+02	3.09E+02	2.78E+02	1.98E+02
1.50	5.95E+02	5.84E+02	4.84E+02	3.20E+02	2.56E+02	2.26E+02	1.51E+02
1.70	5.88E+02	5.75E+02	4.62E+02	2.90E+02	2.27E+02	1.98E+02	1.27E+02
2.00	5.77E+02	5.61E+02	4.30E+02	2.50E+02	1.90E+02	1.63E+02	9.93E+01
2.50	5.59E+02	5.37E+02	3.80E+02	1.99E+02	1.44E+02	1.20E+02	6.74E+01
3.00	5.40E+02	5.14E+02	3.37E+02	1.60E+02	1.11E+02	9.01E+01	4.67E+01
3.50	5.20E+02	4.90E+02	2.99E+02	1.30E+02	8.65E+01	6.85E+01	3.31E+01
4.00	5.00E+02	4.68E+02	2.67E+02	1.07E+02	6.83E+01	5.28E+01	2.43E+01
5.00	4.60E+02	4.23E+02	2.15E+02	7.32E+01	4.34E+01	3.29E+01	1.53E+01
6.00	4.21E+02	3.82E+02	1.75E+02	5.14E+01	2.86E+01	2.19E+01	1.11E+01
7.00	3.85E+02	3.46E+02	1.44E+02	3.71E+01	2.03E+01	1.56E+01	8.08E+00
8.00	3.52E+02	3.13E+02	1.19E+02	2.77E+01	1.56E+01	1.19E+01	5.70E+00
9.00	3.23E+02	2.84E+02	9.91E+01	2.13E+01	1.26E+01	9.41E+00	3.96E+00
10.00	2.97E+02	2.58E+02	8.31E+01	1.69E+01	1.04E+01	7.59E+00	2.82E+00
12.50	2.45E+02	2.06E+02	5.45E+01	1.07E+01	6.19E+00	4.38E+00	1.52E+00
15.00	2.06E+02	1.66E+02	3.65E+01	7.27E+00	3.54E+00	2.51E+00	1.04E+00
17.50	1.73E+02	1.34E+02	2.54E+01	4.97E+00	2.18E+00	1.56E+00	7.30E−01
20.00	1.43E+02	1.09E+02	1.87E+01	3.41E+00	1.53E+00	1.09E+00	4.88E−01
22.50	1.17E+02	8.99E+01	1.46E+01	2.38E+00	1.18E+00	8.35E−01	3.17E−01
25.00	9.58E+01	7.42E+01	1.19E+01	1.73E+00	9.45E−01	6.55E−01	2.07E−01
27.50	7.88E+01	6.15E+01	9.86E+00	1.32E+00	7.53E−01	5.10E−01	1.40E−01
30.00	6.53E+01	5.11E+01	8.21E+00	1.05E+00	5.89E−01	3.90E−01	9.96E−02
35.00	4.59E+01	3.55E+01	5.54E+00	7.11E−01	3.45E−01	2.21E−01	5.83E−02
40.00	3.32E+01	2.51E+01	3.64E+00	4.93E−01	2.00E−01	1.27E−01	3.93E−02
45.00	2.47E+01	1.82E+01	2.43E+00	3.39E−01	1.22E−01	7.83E−02	2.84E−02
50.00	1.88E+01	1.37E+01	1.70E+00	2.32E−01	8.02E−02	5.23E−02	2.10E−02
55.00	1.47E+01	1.07E+01	1.27E+00	1.61E−01	5.71E−02	3.79E−02	1.58E−02
60.00	1.18E+01	8.63E+00	1.01E+00	1.15E−01	4.36E−02	2.93E−02	1.20E−02
65.00	9.68E+00	7.13E+00	8.33E−01	8.56E−02	3.52E−02	2.39E−02	9.33E−03
70.00	8.06E+00	6.00E+00	7.09E−01	6.66E−02	2.97E−02	2.03E−02	7.47E−03
75.00	6.81E+00	5.12E+00	6.16E−01	5.44E−02	2.60E−02	1.78E−02	6.18E−03
80.00	5.85E+00	4.43E+00	5.44E−01	4.66E−02	2.34E−02	1.61E−02	5.28E−03
85.00	5.10E+00	3.89E+00	4.89E−01	4.15E−02	2.16E−02	1.48E−02	4.66E−03
90.00	4.52E+00	3.46E+00	4.46E−01	3.84E−02	2.04E−02	1.39E−02	4.23E−03
95.00	4.08E+00	3.14E+00	4.15E−01	3.65E−02	1.96E−02	1.33E−02	3.92E−03
105.00	3.49E+00	2.70E+00	3.76E−01	3.50E−02	1.87E−02	1.26E−02	3.53E−03
120.00	3.07E+00	2.40E+00	3.59E−01	3.55E−02	1.84E−02	1.22E−02	3.21E−03
135.00	2.94E+00	2.31E+00	3.63E−01	3.69E−02	1.85E−02	1.20E−02	3.02E−03
150.00	2.91E+00	2.30E+00	3.74E−01	3.83E−02	1.85E−02	1.19E−02	2.90E−03
165.00	2.93E+00	2.32E+00	3.83E−01	3.91E−02	1.86E−02	1.18E−02	2.84E−03
180.00	2.93E+00	2.33E+00	3.87E−01	3.94E−02	1.86E−02	1.18E−02	2.82E−03
total	2.45E+02	1.95E+02	4.44E+01	1.06E+01	6.36E+00	4.93E+00	2.49E+00
rel ff	2.68E+02	2.03E+02	4.39E+01	1.06E+01	6.48E+00	5.08E+00	2.61E+00
nrl ff	2.87E+02	2.18E+02	4.94E+01	1.21E+01	7.47E+00	5.87E+00	3.04E+00

TABLE 1. Predicted *S*-matrix differential elastic scattering cross sections for photon energies (50.0, 59.54, 145.4, 316.5, 411.8, 468.1, 661.6, 778.9, 964.0, 1004.8, 1112.1, 1274.5, 1408.0 and 1500.0). The angle integrated total cross sections for each element and energies are presented. ''total'' represents total cross sections from this work, ''rel ff'' represents total cross sections calculated from the relativistic form factor and ''nrl ff'' represents total cross sections calculated from the nonrelativistic form factor—Continued[a]

θ (deg)	Photon energy (keV)						
	778.9	964.0	1004.8	1112.1	1274.5	1408.0	1500.0
Thorium ($Z=90$)							
0.00	6.26E+02	6.26E+02	6.25E+02	6.25E+02	6.25E+02	6.24E+02	6.24E+02
0.01	6.25E+02	6.25E+02	6.24E+02	6.24E+02	6.23E+02	6.23E+02	6.22E+02
0.02	6.24E+02	6.23E+02	6.23E+02	6.22E+02	6.21E+02	6.19E+02	6.18E+02
0.04	6.20E+02	6.17E+02	6.16E+02	6.14E+02	6.10E+02	6.07E+02	6.04E+02
0.06	6.14E+02	6.07E+02	6.05E+02	6.01E+02	5.95E+02	5.89E+02	5.85E+02
0.10	5.95E+02	5.81E+02	5.77E+02	5.69E+02	5.56E+02	5.45E+02	5.38E+02
0.20	5.34E+02	5.04E+02	4.98E+02	4.81E+02	4.57E+02	4.38E+02	4.25E+02
0.30	4.74E+02	4.33E+02	4.24E+02	4.01E+02	3.69E+02	3.45E+02	3.29E+02
0.40	4.17E+02	3.68E+02	3.58E+02	3.33E+02	3.00E+02	2.76E+02	2.62E+02
0.50	3.66E+02	3.14E+02	3.03E+02	2.79E+02	2.46E+02	2.24E+02	2.12E+02
0.60	3.22E+02	2.70E+02	2.60E+02	2.35E+02	2.05E+02	1.84E+02	1.72E+02
0.70	2.85E+02	2.34E+02	2.24E+02	2.01E+02	1.71E+02	1.51E+02	1.39E+02
0.80	2.53E+02	2.04E+02	1.94E+02	1.73E+02	1.45E+02	1.26E+02	1.14E+02
1.00	2.02E+02	1.56E+02	1.48E+02	1.29E+02	1.05E+02	8.87E+01	7.92E+01
1.20	1.63E+02	1.21E+02	1.14E+02	9.73E+01	7.71E+01	6.42E+01	5.67E+01
1.50	1.20E+02	8.52E+01	7.93E+01	6.58E+01	5.01E+01	4.03E+01	3.47E+01
1.70	9.89E+01	6.83E+01	6.31E+01	5.15E+01	3.82E+01	3.00E+01	2.54E+01
2.00	7.50E+01	4.96E+01	4.55E+01	3.64E+01	2.64E+01	2.05E+01	1.73E+01
2.50	4.84E+01	3.01E+01	2.73E+01	2.17E+01	1.62E+01	1.36E+01	1.25E+01
3.00	3.24E+01	1.97E+01	1.79E+01	1.44E+01	1.13E+01	1.03E+01	1.02E+01
3.50	2.30E+01	1.44E+01	1.32E+01	1.07E+01	8.38E+00	7.20E+00	6.64E+00
4.00	1.74E+01	1.14E+01	1.06E+01	8.61E+00	6.22E+00	4.53E+00	3.47E+00
5.00	1.12E+01	7.53E+00	6.91E+00	5.41E+00	3.35E+00	1.91E+00	1.15E+00
6.00	7.63E+00	4.48E+00	4.01E+00	2.99E+00	1.90E+00	1.26E+00	9.28E−01
7.00	5.13E+00	2.63E+00	2.30E+00	1.69E+00	1.22E+00	1.11E+00	1.15E+00
8.00	3.47E+00	1.71E+00	1.50E+00	1.12E+00	8.80E−01	9.21E−01	1.11E+00
9.00	2.44E+00	1.28E+00	1.13E+00	8.69E−01	6.75E−01	6.41E−01	6.79E−01
10.00	1.81E+00	1.06E+00	9.54E−01	7.46E−01	5.28E−01	3.92E−01	3.12E−01
12.50	1.05E+00	6.87E−01	6.28E−01	4.79E−01	2.64E−01	1.21E−01	5.77E−02
15.00	6.80E−01	3.77E−01	3.31E−01	2.33E−01	1.24E−01	6.45E−02	3.70E−02
17.50	4.32E−01	1.95E−01	1.65E−01	1.10E−01	6.64E−02	4.93E−02	4.33E−02
20.00	2.68E−01	1.09E−01	9.18E−02	6.15E−02	4.21E−02	4.05E−02	4.72E−02
22.50	1.70E−01	7.03E−02	5.95E−02	4.13E−02	3.02E−02	3.07E−02	3.71E−02
25.00	1.13E−01	5.10E−02	4.41E−02	3.19E−02	2.32E−02	2.11E−02	2.18E−02
27.50	7.93E−02	4.01E−02	3.55E−02	2.66E−02	1.83E−02	1.37E−02	1.11E−02
30.00	5.90E−02	3.28E−02	2.95E−02	2.25E−02	1.43E−02	8.71E−03	5.55E−03
35.00	3.67E−02	2.21E−02	2.00E−02	1.50E−02	8.17E−03	3.69E−03	1.72E−03
40.00	2.49E−02	1.44E−02	1.28E−02	9.02E−03	4.37E−03	1.78E−03	7.72E−04
45.00	1.75E−02	9.07E−03	7.83E−03	5.16E−03	2.34E−03	9.73E−04	4.51E−04
50.00	1.25E−02	5.70E−03	4.79E−03	2.96E−03	1.30E−03	5.76E−04	2.99E−04
55.00	8.93E−03	3.69E−03	3.04E−03	1.80E−03	7.93E−04	3.85E−04	2.27E−04
60.00	6.52E−03	2.51E−03	2.04E−03	1.19E−03	5.42E−04	2.94E−04	1.97E−04
65.00	4.90E−03	1.80E−03	1.46E−03	8.51E−04	4.07E−04	2.43E−04	1.81E−04
70.00	3.83E−03	1.38E−03	1.12E−03	6.61E−04	3.33E−04	2.16E−04	1.75E−04
75.00	3.13E−03	1.13E−03	9.18E−04	5.51E−04	2.90E−04	1.99E−04	1.70E−04
80.00	2.66E−03	9.69E−04	7.90E−04	4.82E−04	2.63E−04	1.87E−04	1.64E−04
85.00	2.34E−03	8.63E−04	7.07E−04	4.38E−04	2.45E−04	1.78E−04	1.57E−04
90.00	2.12E−03	7.93E−04	6.53E−04	4.09E−04	2.33E−04	1.71E−04	1.51E−04
95.00	1.96E−03	7.42E−04	6.13E−04	3.88E−04	2.24E−04	1.65E−04	1.45E−04
105.00	1.76E−03	6.75E−04	5.60E−04	3.60E−04	2.11E−04	1.57E−04	1.38E−04
120.00	1.59E−03	6.14E−04	5.12E−04	3.34E−04	2.01E−04	1.51E−04	1.33E−04
135.00	1.49E−03	5.83E−04	4.88E−04	3.23E−04	1.98E−04	1.49E−04	1.31E−04
150.00	1.42E−03	5.63E−04	4.73E−04	3.16E−04	1.97E−04	1.50E−04	1.33E−04
165.00	1.39E−03	5.53E−04	4.66E−04	3.14E−04	1.98E−04	1.52E−04	1.35E−04
180.00	1.38E−03	5.50E−04	4.64E−04	3.13E−04	1.99E−04	1.54E−04	1.36E−04
total	1.79E+00	1.17E+00	1.08E+00	8.82E−01	6.66E−01	5.43E−01	4.84E−01
rel ff	1.91E+00	1.26E+00	1.16E+00	9.50E−01	7.25E−01	5.98E−01	5.29E−01
nrl ff	2.22E+00	1.47E+00	1.35E+00	1.11E+00	8.48E−01	6.99E−01	6.19E−01

TABLE 1. Predicted *S*-matrix differential elastic scattering cross sections for photon energies (50.0, 59.54, 145.4, 316.5, 411.8, 468.1, 661.6, 778.9, 964.0, 1004.8, 1112.1, 1274.5, 1408.0 and 1500.0). The angle integrated total cross sections for each element and energies are presented. ''total'' represents total cross sections from this work, ''rel ff'' represents total cross sections calculated from the relativistic form factor and ''nrl ff'' represents total cross sections calculated from the nonrelativistic form factor—Continued[a]

θ (deg)	Photon energy (keV)						
	50.0	59.5	145.4	316.5	411.8	468.1	661.6
Protactinium ($Z=91$)							
0.00	6.39E+02	6.38E+02	6.38E+02	6.42E+02	6.41E+02	6.41E+02	6.40E+02
0.01	6.39E+02	6.38E+02	6.38E+02	6.42E+02	6.41E+02	6.41E+02	6.39E+02
0.02	6.39E+02	6.38E+02	6.38E+02	6.42E+02	6.41E+02	6.40E+02	6.38E+02
0.04	6.38E+02	6.38E+02	6.37E+02	6.41E+02	6.40E+02	6.39E+02	6.36E+02
0.06	6.38E+02	6.38E+02	6.37E+02	6.40E+02	6.38E+02	6.36E+02	6.31E+02
0.10	6.38E+02	6.38E+02	6.37E+02	6.36E+02	6.31E+02	6.28E+02	6.16E+02
0.20	6.38E+02	6.37E+02	6.33E+02	6.20E+02	6.06E+02	5.97E+02	5.65E+02
0.30	6.37E+02	6.36E+02	6.26E+02	5.97E+02	5.73E+02	5.59E+02	5.12E+02
0.40	6.36E+02	6.35E+02	6.19E+02	5.72E+02	5.40E+02	5.22E+02	4.61E+02
0.50	6.35E+02	6.33E+02	6.10E+02	5.46E+02	5.07E+02	4.85E+02	4.13E+02
0.60	6.34E+02	6.31E+02	5.98E+02	5.21E+02	4.75E+02	4.50E+02	3.70E+02
0.70	6.32E+02	6.28E+02	5.87E+02	4.96E+02	4.44E+02	4.16E+02	3.32E+02
0.80	6.30E+02	6.25E+02	5.76E+02	4.71E+02	4.15E+02	3.85E+02	2.99E+02
1.00	6.25E+02	6.18E+02	5.52E+02	4.25E+02	3.62E+02	3.30E+02	2.45E+02
1.20	6.20E+02	6.11E+02	5.29E+02	3.82E+02	3.16E+02	2.85E+02	2.03E+02
1.50	6.09E+02	5.97E+02	4.94E+02	3.27E+02	2.62E+02	2.31E+02	1.55E+02
1.70	6.02E+02	5.88E+02	4.72E+02	2.96E+02	2.32E+02	2.02E+02	1.30E+02
2.00	5.90E+02	5.74E+02	4.39E+02	2.56E+02	1.95E+02	1.67E+02	1.02E+02
2.50	5.72E+02	5.49E+02	3.88E+02	2.04E+02	1.48E+02	1.23E+02	6.96E+01
3.00	5.52E+02	5.26E+02	3.44E+02	1.64E+02	1.14E+02	9.26E+01	4.84E+01
3.50	5.32E+02	5.02E+02	3.06E+02	1.34E+02	8.90E+01	7.06E+01	3.43E+01
4.00	5.12E+02	4.78E+02	2.73E+02	1.10E+02	7.04E+01	5.46E+01	2.51E+01
5.00	4.71E+02	4.33E+02	2.20E+02	7.54E+01	4.49E+01	3.41E+01	1.57E+01
6.00	4.31E+02	3.91E+02	1.79E+02	5.31E+01	2.96E+01	2.26E+01	1.13E+01
7.00	3.95E+02	3.54E+02	1.47E+02	3.84E+01	2.09E+01	1.60E+01	8.32E+00
8.00	3.61E+02	3.20E+02	1.22E+02	2.86E+01	1.59E+01	1.22E+01	5.92E+00
9.00	3.31E+02	2.91E+02	1.01E+02	2.20E+01	1.29E+01	9.64E+00	4.13E+00
10.00	3.04E+02	2.65E+02	8.51E+01	1.74E+01	1.06E+01	7.80E+00	2.94E+00
12.50	2.51E+02	2.11E+02	5.61E+01	1.10E+01	6.42E+00	4.54E+00	1.56E+00
15.00	2.11E+02	1.70E+02	3.77E+01	7.48E+00	3.68E+00	2.61E+00	1.07E+00
17.50	1.77E+02	1.38E+02	2.61E+01	5.14E+00	2.26E+00	1.61E+00	7.54E−01
20.00	1.47E+02	1.13E+02	1.91E+01	3.53E+00	1.57E+00	1.13E+00	5.09E−01
22.50	1.21E+02	9.25E+01	1.48E+01	2.47E+00	1.21E+00	8.57E−01	3.33E−01
25.00	9.93E+01	7.66E+01	1.20E+01	1.80E+00	9.69E−01	6.74E−01	2.18E−01
27.50	8.19E+01	6.36E+01	9.99E+00	1.36E+00	7.76E−01	5.27E−01	1.47E−01
30.00	6.79E+01	5.30E+01	8.34E+00	1.08E+00	6.11E−01	4.05E−01	1.04E−01
35.00	4.79E+01	3.69E+01	5.66E+00	7.31E−01	3.61E−01	2.32E−01	6.03E−02
40.00	3.46E+01	2.61E+01	3.73E+00	5.10E−01	2.10E−01	1.34E−01	4.04E−02
45.00	2.57E+01	1.89E+01	2.49E+00	3.52E−01	1.28E−01	8.19E−02	2.91E−02
50.00	1.96E+01	1.42E+01	1.73E+00	2.43E−01	8.37E−02	5.44E−02	2.15E−02
55.00	1.53E+01	1.10E+01	1.29E+00	1.69E−01	5.93E−02	3.91E−02	1.62E−02
60.00	1.23E+01	8.89E+00	1.02E+00	1.21E−01	4.50E−02	3.02E−02	1.24E−02
65.00	1.01E+01	7.34E+00	8.36E−01	8.97E−02	3.62E−02	2.46E−02	9.70E−03
70.00	8.38E+00	6.19E+00	7.10E−01	6.96E−02	3.05E−02	2.08E−02	7.80E−03
75.00	7.10E+00	5.29E+00	6.17E−01	5.68E−02	2.67E−02	1.83E−02	6.48E−03
80.00	6.11E+00	4.59E+00	5.46E−01	4.85E−02	2.40E−02	1.65E−02	5.56E−03
85.00	5.34E+00	4.04E+00	4.92E−01	4.31E−02	2.22E−02	1.53E−02	4.92E−03
90.00	4.75E+00	3.61E+00	4.50E−01	3.98E−02	2.10E−02	1.44E−02	4.48E−03
95.00	4.30E+00	3.28E+00	4.20E−01	3.78E−02	2.02E−02	1.38E−02	4.16E−03
105.00	3.70E+00	2.84E+00	3.82E−01	3.62E−02	1.94E−02	1.31E−02	3.75E−03
120.00	3.27E+00	2.54E+00	3.65E−01	3.66E−02	1.91E−02	1.27E−02	3.42E−03
135.00	3.13E+00	2.44E+00	3.70E−01	3.82E−02	1.92E−02	1.26E−02	3.23E−03
150.00	3.11E+00	2.44E+00	3.81E−01	3.96E−02	1.94E−02	1.25E−02	3.11E−03
165.00	3.12E+00	2.45E+00	3.90E−01	4.05E−02	1.94E−02	1.24E−02	3.04E−03
180.00	3.13E+00	2.46E+00	3.93E−01	4.08E−02	1.94E−02	1.24E−02	3.02E−03
total	2.54E+02	2.02E+02	4.53E+01	1.09E+01	6.55E+00	5.08E+00	2.57E+00
rel ff	2.76E+02	2.09E+02	4.52E+01	1.09E+01	6.67E+00	5.23E+00	2.69E+00
nrl ff	2.95E+02	2.25E+02	5.09E+01	1.25E+01	7.72E+00	6.07E+00	3.14E+00

TABLE 1. Predicted *S*-matrix differential elastic scattering cross sections for photon energies (50.0, 59.54, 145.4, 316.5, 411.8, 468.1, 661.6, 778.9, 964.0, 1004.8, 1112.1, 1274.5, 1408.0 and 1500.0). The angle integrated total cross sections for each element and energies are presented. ''total'' represents total cross sections from this work, ''rel ff'' represents total cross sections calculated from the relativistic form factor and ''nrl ff'' represents total cross sections calculated from the nonrelativistic form factor—Continued[a]

θ (deg)	Photon energy (keV)						
	778.9	964.0	1004.8	1112.1	1274.5	1408.0	1500.0
Protactinium ($Z=91$)							
0.00	6.40E+02	6.39E+02	6.39E+02	6.39E+02	6.39E+02	6.38E+02	6.37E+02
0.01	6.39E+02	6.38E+02	6.38E+02	6.38E+02	6.37E+02	6.36E+02	6.35E+02
0.02	6.38E+02	6.37E+02	6.37E+02	6.36E+02	6.35E+02	6.33E+02	6.31E+02
0.04	6.34E+02	6.30E+02	6.29E+02	6.27E+02	6.23E+02	6.20E+02	6.17E+02
0.06	6.27E+02	6.20E+02	6.19E+02	6.14E+02	6.07E+02	6.02E+02	5.97E+02
0.10	6.08E+02	5.93E+02	5.90E+02	5.81E+02	5.68E+02	5.57E+02	5.50E+02
0.20	5.46E+02	5.15E+02	5.09E+02	4.91E+02	4.67E+02	4.47E+02	4.35E+02
0.30	4.84E+02	4.42E+02	4.33E+02	4.10E+02	3.78E+02	3.53E+02	3.36E+02
0.40	4.26E+02	3.76E+02	3.66E+02	3.41E+02	3.06E+02	2.82E+02	2.68E+02
0.50	3.74E+02	3.21E+02	3.10E+02	2.85E+02	2.52E+02	2.30E+02	2.17E+02
0.60	3.29E+02	2.76E+02	2.66E+02	2.41E+02	2.09E+02	1.88E+02	1.76E+02
0.70	2.91E+02	2.39E+02	2.29E+02	2.06E+02	1.76E+02	1.55E+02	1.43E+02
0.80	2.59E+02	2.08E+02	1.99E+02	1.77E+02	1.48E+02	1.29E+02	1.17E+02
1.00	2.06E+02	1.60E+02	1.52E+02	1.32E+02	1.08E+02	9.12E+01	8.15E+01
1.20	1.67E+02	1.25E+02	1.17E+02	9.99E+01	7.94E+01	6.63E+01	5.87E+01
1.50	1.23E+02	8.77E+01	8.16E+01	6.79E+01	5.18E+01	4.18E+01	3.61E+01
1.70	1.02E+02	7.04E+01	6.52E+01	5.33E+01	3.96E+01	3.11E+01	2.63E+01
2.00	7.73E+01	5.14E+01	4.71E+01	3.78E+01	2.73E+01	2.11E+01	1.77E+01
2.50	5.01E+01	3.12E+01	2.83E+01	2.25E+01	1.67E+01	1.38E+01	1.26E+01
3.00	3.36E+01	2.03E+01	1.84E+01	1.48E+01	1.16E+01	1.05E+01	1.05E+01
3.50	2.37E+01	1.47E+01	1.35E+01	1.09E+01	8.59E+00	7.50E+00	7.05E+00
4.00	1.78E+01	1.17E+01	1.08E+01	8.78E+00	6.42E+00	4.77E+00	3.74E+00
5.00	1.15E+01	7.76E+00	7.13E+00	5.61E+00	3.48E+00	1.99E+00	1.19E+00
6.00	7.86E+00	4.68E+00	4.20E+00	3.14E+00	1.97E+00	1.28E+00	9.11E−01
7.00	5.32E+00	2.75E+00	2.41E+00	1.77E+00	1.26E+00	1.11E+00	1.13E+00
8.00	3.61E+00	1.77E+00	1.55E+00	1.15E+00	9.05E−01	9.46E−01	1.14E+00
9.00	2.53E+00	1.31E+00	1.16E+00	8.86E−01	6.93E−01	6.74E−01	7.35E−01
10.00	1.88E+00	1.08E+00	9.71E−01	7.58E−01	5.44E−01	4.19E−01	3.47E−01
12.50	1.08E+00	7.09E−01	6.49E−01	4.98E−01	2.76E−01	1.28E−01	6.16E−02
15.00	7.02E−01	3.96E−01	3.49E−01	2.47E−01	1.31E−01	6.62E−02	3.67E−02
17.50	4.49E−01	2.06E−01	1.75E−01	1.17E−01	6.95E−02	4.97E−02	4.20E−02
20.00	2.81E−01	1.15E−01	9.65E−02	6.44E−02	4.35E−02	4.10E−02	4.69E−02
22.50	1.78E−01	7.31E−02	6.18E−02	4.26E−02	3.09E−02	3.16E−02	3.84E−02
25.00	1.18E−01	5.25E−02	4.52E−02	3.25E−02	2.37E−02	2.20E−02	2.34E−02
27.50	8.27E−02	4.10E−02	3.62E−02	2.69E−02	1.87E−02	1.44E−02	1.21E−02
30.00	6.11E−02	3.35E−02	3.00E−02	2.28E−02	1.47E−02	9.23E−03	6.10E−03
35.00	3.77E−02	2.27E−02	2.05E−02	1.55E−02	8.51E−03	3.93E−03	1.86E−03
40.00	2.56E−02	1.49E−02	1.32E−02	9.43E−03	4.63E−03	1.90E−03	8.26E−04
45.00	1.80E−02	9.47E−03	8.21E−03	5.47E−03	2.51E−03	1.04E−03	4.79E−04
50.00	1.29E−02	6.00E−03	5.07E−03	3.17E−03	1.40E−03	6.20E−04	3.18E−04
55.00	9.27E−03	3.91E−03	3.23E−03	1.94E−03	8.60E−04	4.16E−04	2.42E−04
60.00	6.81E−03	2.67E−03	2.18E−03	1.29E−03	5.90E−04	3.18E−04	2.10E−04
65.00	5.15E−03	1.93E−03	1.57E−03	9.22E−04	4.43E−04	2.63E−04	1.94E−04
70.00	4.05E−03	1.49E−03	1.21E−03	7.17E−04	3.62E−04	2.34E−04	1.87E−04
75.00	3.32E−03	1.22E−03	9.91E−04	5.98E−04	3.15E−04	2.16E−04	1.82E−04
80.00	2.83E−03	1.04E−03	8.54E−04	5.23E−04	2.86E−04	2.02E−04	1.75E−04
85.00	2.49E−03	9.32E−04	7.65E−04	4.75E−04	2.66E−04	1.92E−04	1.69E−04
90.00	2.27E−03	8.56E−04	7.06E−04	4.44E−04	2.53E−04	1.84E−04	1.62E−04
95.00	2.10E−03	8.02E−04	6.63E−04	4.21E−04	2.42E−04	1.78E−04	1.56E−04
105.00	1.89E−03	7.30E−04	6.06E−04	3.90E−04	2.29E−04	1.69E−04	1.48E−04
120.00	1.71E−03	6.65E−04	5.55E−04	3.62E−04	2.17E−04	1.62E−04	1.42E−04
135.00	1.60E−03	6.30E−04	5.28E−04	3.49E−04	2.13E−04	1.60E−04	1.40E−04
150.00	1.53E−03	6.09E−04	5.12E−04	3.41E−04	2.12E−04	1.61E−04	1.41E−04
165.00	1.50E−03	5.98E−04	5.04E−04	3.38E−04	2.12E−04	1.63E−04	1.44E−04
180.00	1.49E−03	5.95E−04	5.01E−04	3.38E−04	2.13E−04	1.64E−04	1.45E−04
total	1.85E+00	1.21E+00	1.11E+00	9.09E−01	6.86E−01	5.59E−01	4.99E−01
rel ff	1.96E+00	1.30E+00	1.20E+00	9.79E−01	7.48E−01	6.16E−01	5.45E−01
nrl ff	2.30E+00	1.52E+00	1.40E+00	1.15E+00	8.78E−01	7.24E−01	6.41E−01

TABLE 1. Predicted *S*-matrix differential elastic scattering cross sections for photon energies (50.0, 59.54, 145.4, 316.5, 411.8, 468.1, 661.6, 778.9, 964.0, 1004.8, 1112.1, 1274.5, 1408.0 and 1500.0). The angle integrated total cross sections for each element and energies are presented. ''total'' represents total cross sections from this work, ''rel ff'' represents total cross sections calculated from the relativistic form factor and ''nrl ff'' represents total cross sections calculated from the nonrelativistic form factor—Continued[a]

θ (deg)	Photon energy (keV)						
	50.0	59.5	145.4	316.5	411.8	468.1	661.6
Uranium ($Z=92$)							
0.00	6.53E+02	6.52E+02	6.51E+02	6.56E+02	6.55E+02	6.55E+02	6.54E+02
0.01	6.53E+02	6.52E+02	6.51E+02	6.56E+02	6.55E+02	6.54E+02	6.53E+02
0.02	6.53E+02	6.52E+02	6.50E+02	6.56E+02	6.54E+02	6.54E+02	6.52E+02
0.04	6.53E+02	6.52E+02	6.50E+02	6.55E+02	6.54E+02	6.53E+02	6.49E+02
0.06	6.53E+02	6.52E+02	6.50E+02	6.54E+02	6.51E+02	6.50E+02	6.44E+02
0.10	6.53E+02	6.52E+02	6.49E+02	6.50E+02	6.45E+02	6.42E+02	6.29E+02
0.20	6.52E+02	6.51E+02	6.46E+02	6.33E+02	6.19E+02	6.10E+02	5.78E+02
0.30	6.52E+02	6.50E+02	6.39E+02	6.10E+02	5.86E+02	5.72E+02	5.23E+02
0.40	6.51E+02	6.49E+02	6.31E+02	5.85E+02	5.52E+02	5.33E+02	4.71E+02
0.50	6.50E+02	6.47E+02	6.22E+02	5.58E+02	5.19E+02	4.96E+02	4.22E+02
0.60	6.48E+02	6.45E+02	6.10E+02	5.33E+02	4.86E+02	4.60E+02	3.78E+02
0.70	6.46E+02	6.42E+02	5.99E+02	5.07E+02	4.54E+02	4.26E+02	3.39E+02
0.80	6.45E+02	6.39E+02	5.87E+02	4.82E+02	4.24E+02	3.94E+02	3.05E+02
1.00	6.40E+02	6.32E+02	5.63E+02	4.35E+02	3.70E+02	3.38E+02	2.50E+02
1.20	6.34E+02	6.24E+02	5.40E+02	3.91E+02	3.24E+02	2.91E+02	2.07E+02
1.50	6.23E+02	6.11E+02	5.04E+02	3.35E+02	2.68E+02	2.36E+02	1.58E+02
1.70	6.16E+02	6.01E+02	4.81E+02	3.03E+02	2.37E+02	2.07E+02	1.33E+02
2.00	6.04E+02	5.87E+02	4.48E+02	2.62E+02	1.99E+02	1.71E+02	1.05E+02
2.50	5.85E+02	5.62E+02	3.96E+02	2.09E+02	1.51E+02	1.26E+02	7.17E+01
3.00	5.65E+02	5.37E+02	3.51E+02	1.68E+02	1.17E+02	9.52E+01	5.01E+01
3.50	5.45E+02	5.13E+02	3.12E+02	1.37E+02	9.15E+01	7.27E+01	3.55E+01
4.00	5.24E+02	4.89E+02	2.78E+02	1.13E+02	7.26E+01	5.64E+01	2.60E+01
5.00	4.83E+02	4.43E+02	2.24E+02	7.77E+01	4.65E+01	3.53E+01	1.61E+01
6.00	4.42E+02	4.01E+02	1.83E+02	5.49E+01	3.07E+01	2.34E+01	1.16E+01
7.00	4.05E+02	3.62E+02	1.50E+02	3.97E+01	2.15E+01	1.65E+01	8.56E+00
8.00	3.70E+02	3.28E+02	1.24E+02	2.96E+01	1.63E+01	1.25E+01	6.13E+00
9.00	3.39E+02	2.98E+02	1.04E+02	2.27E+01	1.32E+01	9.88E+00	4.30E+00
10.00	3.11E+02	2.71E+02	8.72E+01	1.80E+01	1.09E+01	8.00E+00	3.06E+00
12.50	2.57E+02	2.16E+02	5.77E+01	1.13E+01	6.64E+00	4.70E+00	1.61E+00
15.00	2.16E+02	1.74E+02	3.88E+01	7.69E+00	3.84E+00	2.72E+00	1.09E+00
17.50	1.82E+02	1.41E+02	2.68E+01	5.31E+00	2.34E+00	1.67E+00	7.77E−01
20.00	1.51E+02	1.16E+02	1.95E+01	3.66E+00	1.62E+00	1.16E+00	5.30E−01
22.50	1.25E+02	9.52E+01	1.50E+01	2.57E+00	1.24E+00	8.80E−01	3.49E−01
25.00	1.03E+02	7.89E+01	1.22E+01	1.86E+00	9.93E−01	6.93E−01	2.29E−01
27.50	8.51E+01	6.57E+01	1.01E+01	1.41E+00	7.98E−01	5.44E−01	1.54E−01
30.00	7.07E+01	5.48E+01	8.45E+00	1.11E+00	6.32E−01	4.21E−01	1.09E−01
35.00	4.99E+01	3.83E+01	5.77E+00	7.52E−01	3.77E−01	2.43E−01	6.25E−02
40.00	3.61E+01	2.71E+01	3.82E+00	5.26E−01	2.21E−01	1.40E−01	4.15E−02
45.00	2.68E+01	1.96E+01	2.54E+00	3.66E−01	1.34E−01	8.58E−02	2.98E−02
50.00	2.03E+01	1.47E+01	1.76E+00	2.53E−01	8.75E−02	5.67E−02	2.21E−02
55.00	1.59E+01	1.14E+01	1.30E+00	1.77E−01	6.16E−02	4.05E−02	1.67E−02
60.00	1.27E+01	9.15E+00	1.02E+00	1.27E−01	4.65E−02	3.11E−02	1.28E−02
65.00	1.04E+01	7.56E+00	8.36E−01	9.40E−02	3.73E−02	2.52E−02	1.01E−02
70.00	8.71E+00	6.37E+00	7.09E−01	7.29E−02	3.14E−02	2.14E−02	8.13E−03
75.00	7.39E+00	5.46E+00	6.16E−01	5.93E−02	2.74E−02	1.88E−02	6.78E−03
80.00	6.38E+00	4.75E+00	5.46E−01	5.05E−02	2.47E−02	1.70E−02	5.84E−03
85.00	5.59E+00	4.19E+00	4.93E−01	4.48E−02	2.29E−02	1.57E−02	5.18E−03
90.00	4.99E+00	3.76E+00	4.53E−01	4.13E−02	2.16E−02	1.49E−02	4.73E−03
95.00	4.53E+00	3.43E+00	4.23E−01	3.91E−02	2.08E−02	1.43E−02	4.40E−03
105.00	3.91E+00	2.98E+00	3.87E−01	3.74E−02	2.01E−02	1.36E−02	3.99E−03
120.00	3.48E+00	2.68E+00	3.70E−01	3.79E−02	1.99E−02	1.33E−02	3.65E−03
135.00	3.34E+00	2.58E+00	3.75E−01	3.95E−02	2.00E−02	1.32E−02	3.45E−03
150.00	3.31E+00	2.57E+00	3.85E−01	4.10E−02	2.02E−02	1.31E−02	3.33E−03
165.00	3.33E+00	2.59E+00	3.94E−01	4.19E−02	2.03E−02	1.30E−02	3.25E−03
180.00	3.33E+00	2.60E+00	3.97E−01	4.23E−02	2.03E−02	1.30E−02	3.23E−03
total	2.63E+02	2.08E+02	4.62E+01	1.12E+01	6.75E+00	5.23E+00	2.64E+00
rel ff	2.84E+02	2.15E+02	4.65E+01	1.12E+01	6.86E+00	5.38E+00	2.77E+00
nrl ff	3.04E+02	2.31E+02	5.25E+01	1.29E+01	7.98E+00	6.27E+00	3.25E+00

TABLE 1. Predicted *S*-matrix differential elastic scattering cross sections for photon energies (50.0, 59.54, 145.4, 316.5, 411.8, 468.1, 661.6, 778.9, 964.0, 1004.8, 1112.1, 1274.5, 1408.0 and 1500.0). The angle integrated total cross sections for each element and energies are presented. ''total'' represents total cross sections from this work, ''rel ff'' represents total cross sections calculated from the relativistic form factor and ''nrl ff'' represents total cross sections calculated from the nonrelativistic form factor—Continued[a]

θ (deg)	Photon energy (keV)						
	778.9	964.0	1004.8	1112.1	1274.5	1408.0	1500.0
Uranium ($Z=92$)							
0.00	6.53E+02	6.53E+02	6.53E+02	6.53E+02	6.52E+02	6.52E+02	6.51E+02
0.01	6.53E+02	6.52E+02	6.52E+02	6.52E+02	6.51E+02	6.50E+02	6.49E+02
0.02	6.52E+02	6.51E+02	6.50E+02	6.50E+02	6.48E+02	6.46E+02	6.45E+02
0.04	6.47E+02	6.44E+02	6.43E+02	6.41E+02	6.37E+02	6.33E+02	6.30E+02
0.06	6.41E+02	6.34E+02	6.32E+02	6.28E+02	6.21E+02	6.15E+02	6.10E+02
0.10	6.21E+02	6.06E+02	6.03E+02	5.94E+02	5.80E+02	5.69E+02	5.62E+02
0.20	5.58E+02	5.27E+02	5.20E+02	5.02E+02	4.77E+02	4.57E+02	4.45E+02
0.30	4.95E+02	4.52E+02	4.43E+02	4.20E+02	3.86E+02	3.61E+02	3.44E+02
0.40	4.36E+02	3.85E+02	3.74E+02	3.48E+02	3.13E+02	2.89E+02	2.74E+02
0.50	3.83E+02	3.28E+02	3.17E+02	2.91E+02	2.58E+02	2.35E+02	2.22E+02
0.60	3.37E+02	2.82E+02	2.72E+02	2.46E+02	2.14E+02	1.93E+02	1.80E+02
0.70	2.98E+02	2.44E+02	2.34E+02	2.10E+02	1.80E+02	1.59E+02	1.46E+02
0.80	2.65E+02	2.13E+02	2.04E+02	1.81E+02	1.52E+02	1.32E+02	1.20E+02
1.00	2.11E+02	1.64E+02	1.55E+02	1.35E+02	1.10E+02	9.37E+01	8.39E+01
1.20	1.71E+02	1.28E+02	1.20E+02	1.03E+02	8.18E+01	6.84E+01	6.08E+01
1.50	1.26E+02	9.01E+01	8.40E+01	7.00E+01	5.36E+01	4.33E+01	3.75E+01
1.70	1.04E+02	7.26E+01	6.72E+01	5.51E+01	4.10E+01	3.22E+01	2.72E+01
2.00	7.96E+01	5.31E+01	4.88E+01	3.91E+01	2.83E+01	2.17E+01	1.81E+01
2.50	5.18E+01	3.23E+01	2.94E+01	2.32E+01	1.72E+01	1.41E+01	1.27E+01
3.00	3.47E+01	2.09E+01	1.90E+01	1.52E+01	1.19E+01	1.08E+01	1.07E+01
3.50	2.45E+01	1.51E+01	1.38E+01	1.12E+01	8.80E+00	7.79E+00	7.45E+00
4.00	1.84E+01	1.19E+01	1.10E+01	8.95E+00	6.60E+00	5.02E+00	4.03E+00
5.00	1.18E+01	7.99E+00	7.35E+00	5.80E+00	3.62E+00	2.07E+00	1.24E+00
6.00	8.09E+00	4.88E+00	4.38E+00	3.29E+00	2.05E+00	1.30E+00	8.99E−01
7.00	5.51E+00	2.87E+00	2.52E+00	1.85E+00	1.31E+00	1.12E+00	1.10E+00
8.00	3.75E+00	1.84E+00	1.61E+00	1.19E+00	9.31E−01	9.68E−01	1.16E+00
9.00	2.63E+00	1.35E+00	1.19E+00	9.05E−01	7.12E−01	7.06E−01	7.88E−01
10.00	1.94E+00	1.10E+00	9.89E−01	7.70E−01	5.60E−01	4.46E−01	3.84E−01
12.50	1.11E+00	7.31E−01	6.69E−01	5.15E−01	2.89E−01	1.36E−01	6.62E−02
15.00	7.24E−01	4.15E−01	3.68E−01	2.61E−01	1.38E−01	6.81E−02	3.67E−02
17.50	4.68E−01	2.18E−01	1.86E−01	1.24E−01	7.27E−02	5.03E−02	4.08E−02
20.00	2.94E−01	1.21E−01	1.02E−01	6.76E−02	4.50E−02	4.15E−02	4.64E−02
22.50	1.87E−01	7.62E−02	6.42E−02	4.40E−02	3.17E−02	3.23E−02	3.94E−02
25.00	1.24E−01	5.41E−02	4.65E−02	3.32E−02	2.42E−02	2.29E−02	2.49E−02
27.50	8.62E−02	4.20E−02	3.69E−02	2.73E−02	1.91E−02	1.51E−02	1.32E−02
30.00	6.34E−02	3.42E−02	3.05E−02	2.32E−02	1.51E−02	9.78E−03	6.70E−03
35.00	3.88E−02	2.32E−02	2.10E−02	1.59E−02	8.86E−03	4.18E−03	2.03E−03
40.00	2.63E−02	1.53E−02	1.37E−02	9.84E−03	4.89E−03	2.03E−03	8.85E−04
45.00	1.85E−02	9.87E−03	8.59E−03	5.78E−03	2.68E−03	1.11E−03	5.09E−04
50.00	1.33E−02	6.31E−03	5.35E−03	3.39E−03	1.51E−03	6.66E−04	3.37E−04
55.00	9.62E−03	4.14E−03	3.44E−03	2.09E−03	9.33E−04	4.49E−04	2.58E−04
60.00	7.11E−03	2.85E−03	2.33E−03	1.39E−03	6.41E−04	3.43E−04	2.24E−04
65.00	5.40E−03	2.06E−03	1.68E−03	9.98E−04	4.81E−04	2.84E−04	2.07E−04
70.00	4.26E−03	1.59E−03	1.30E−03	7.77E−04	3.94E−04	2.53E−04	2.00E−04
75.00	3.51E−03	1.31E−03	1.07E−03	6.48E−04	3.43E−04	2.33E−04	1.95E−04
80.00	3.00E−03	1.12E−03	9.22E−04	5.67E−04	3.10E−04	2.19E−04	1.88E−04
85.00	2.65E−03	1.00E−03	8.26E−04	5.15E−04	2.89E−04	2.08E−04	1.81E−04
90.00	2.42E−03	9.24E−04	7.63E−04	4.81E−04	2.74E−04	1.99E−04	1.74E−04
95.00	2.25E−03	8.66E−04	7.17E−04	4.56E−04	2.63E−04	1.92E−04	1.68E−04
105.00	2.02E−03	7.89E−04	6.56E−04	4.22E−04	2.48E−04	1.82E−04	1.59E−04
120.00	1.83E−03	7.19E−04	6.00E−04	3.91E−04	2.34E−04	1.74E−04	1.52E−04
135.00	1.72E−03	6.81E−04	5.71E−04	3.77E−04	2.29E−04	1.72E−04	1.50E−04
150.00	1.65E−03	6.58E−04	5.53E−04	3.68E−04	2.27E−04	1.72E−04	1.50E−04
165.00	1.61E−03	6.46E−04	5.44E−04	3.65E−04	2.28E−04	1.74E−04	1.53E−04
180.00	1.60E−03	6.42E−04	5.42E−04	3.64E−04	2.29E−04	1.75E−04	1.54E−04
total	1.90E+00	1.24E+00	1.15E+00	9.36E−01	7.07E−01	5.76E−01	5.14E−01
rel ff	2.02E+00	1.34E+00	1.23E+00	1.01E+00	7.71E−01	6.35E−01	5.62E−01
nrl ff	2.38E+00	1.57E+00	1.45E+00	1.19E+00	9.09E−01	7.50E−01	6.64E−01

TABLE 1. Predicted *S*-matrix differential elastic scattering cross sections for photon energies (50.0, 59.54, 145.4, 316.5, 411.8, 468.1, 661.6, 778.9, 964.0, 1004.8, 1112.1, 1274.5, 1408.0 and 1500.0). The angle integrated total cross sections for each element and energies are presented. ''total'' represents total cross sections from this work, ''rel ff'' represents total cross sections calculated from the relativistic form factor and ''nrl ff'' represents total cross sections calculated from the nonrelativistic form factor—Continued[a]

θ (deg)	Photon energy (keV)						
	50.0	59.5	145.4	316.5	411.8	468.1	661.6
Neptunium ($Z=93$)							
0.00	6.68E+02	6.67E+02	6.63E+02	6.70E+02	6.69E+02	6.69E+02	6.68E+02
0.01	6.68E+02	6.67E+02	6.63E+02	6.70E+02	6.69E+02	6.68E+02	6.67E+02
0.02	6.68E+02	6.67E+02	6.63E+02	6.70E+02	6.68E+02	6.68E+02	6.66E+02
0.04	6.68E+02	6.67E+02	6.63E+02	6.69E+02	6.68E+02	6.67E+02	6.63E+02
0.06	6.68E+02	6.67E+02	6.63E+02	6.68E+02	6.65E+02	6.64E+02	6.58E+02
0.10	6.67E+02	6.66E+02	6.62E+02	6.64E+02	6.58E+02	6.55E+02	6.43E+02
0.20	6.67E+02	6.66E+02	6.58E+02	6.47E+02	6.32E+02	6.23E+02	5.90E+02
0.30	6.67E+02	6.65E+02	6.51E+02	6.23E+02	5.99E+02	5.84E+02	5.35E+02
0.40	6.65E+02	6.63E+02	6.43E+02	5.97E+02	5.64E+02	5.45E+02	4.82E+02
0.50	6.64E+02	6.61E+02	6.34E+02	5.71E+02	5.30E+02	5.07E+02	4.32E+02
0.60	6.63E+02	6.59E+02	6.23E+02	5.44E+02	4.97E+02	4.70E+02	3.87E+02
0.70	6.61E+02	6.56E+02	6.11E+02	5.18E+02	4.65E+02	4.35E+02	3.47E+02
0.80	6.59E+02	6.53E+02	5.99E+02	4.93E+02	4.34E+02	4.03E+02	3.13E+02
1.00	6.54E+02	6.46E+02	5.75E+02	4.45E+02	3.79E+02	3.46E+02	2.56E+02
1.20	6.48E+02	6.38E+02	5.50E+02	4.00E+02	3.31E+02	2.98E+02	2.12E+02
1.50	6.37E+02	6.24E+02	5.15E+02	3.43E+02	2.74E+02	2.42E+02	1.62E+02
1.70	6.30E+02	6.15E+02	4.91E+02	3.10E+02	2.43E+02	2.12E+02	1.37E+02
2.00	6.18E+02	6.00E+02	4.57E+02	2.68E+02	2.04E+02	1.75E+02	1.07E+02
2.50	5.98E+02	5.75E+02	4.05E+02	2.13E+02	1.55E+02	1.30E+02	7.39E+01
3.00	5.79E+02	5.50E+02	3.58E+02	1.72E+02	1.20E+02	9.78E+01	5.18E+01
3.50	5.58E+02	5.25E+02	3.18E+02	1.40E+02	9.40E+01	7.49E+01	3.68E+01
4.00	5.37E+02	5.01E+02	2.84E+02	1.15E+02	7.48E+01	5.82E+01	2.69E+01
5.00	4.95E+02	4.54E+02	2.29E+02	7.99E+01	4.81E+01	3.65E+01	1.65E+01
6.00	4.54E+02	4.10E+02	1.86E+02	5.66E+01	3.18E+01	2.41E+01	1.19E+01
7.00	4.15E+02	3.71E+02	1.53E+02	4.11E+01	2.22E+01	1.70E+01	8.80E+00
8.00	3.80E+02	3.36E+02	1.27E+02	3.06E+01	1.68E+01	1.28E+01	6.35E+00
9.00	3.48E+02	3.05E+02	1.06E+02	2.34E+01	1.35E+01	1.01E+01	4.48E+00
10.00	3.19E+02	2.77E+02	8.91E+01	1.85E+01	1.11E+01	8.20E+00	3.18E+00
12.50	2.63E+02	2.22E+02	5.92E+01	1.15E+01	6.86E+00	4.86E+00	1.66E+00
15.00	2.21E+02	1.78E+02	3.99E+01	7.89E+00	3.99E+00	2.82E+00	1.12E+00
17.50	1.86E+02	1.45E+02	2.75E+01	5.47E+00	2.43E+00	1.73E+00	8.00E−01
20.00	1.56E+02	1.19E+02	1.99E+01	3.79E+00	1.67E+00	1.19E+00	5.51E−01
22.50	1.29E+02	9.79E+01	1.53E+01	2.66E+00	1.27E+00	9.03E−01	3.65E−01
25.00	1.07E+02	8.13E+01	1.23E+01	1.93E+00	1.02E+00	7.11E−01	2.41E−01
27.50	8.83E+01	6.78E+01	1.02E+01	1.46E+00	8.20E−01	5.61E−01	1.62E−01
30.00	7.35E+01	5.67E+01	8.54E+00	1.15E+00	6.53E−01	4.36E−01	1.14E−01
35.00	5.20E+01	3.98E+01	5.86E+00	7.73E−01	3.94E−01	2.54E−01	6.47E−02
40.00	3.76E+01	2.82E+01	3.90E+00	5.43E−01	2.32E−01	1.47E−01	4.27E−02
45.00	2.79E+01	2.04E+01	2.59E+00	3.80E−01	1.41E−01	8.99E−02	3.05E−02
50.00	2.12E+01	1.52E+01	1.79E+00	2.64E−01	9.14E−02	5.91E−02	2.27E−02
55.00	1.65E+01	1.18E+01	1.31E+00	1.85E−01	6.40E−02	4.20E−02	1.72E−02
60.00	1.32E+01	9.42E+00	1.02E+00	1.33E−01	4.82E−02	3.21E−02	1.32E−02
65.00	1.08E+01	7.77E+00	8.34E−01	9.85E−02	3.85E−02	2.60E−02	1.04E−02
70.00	9.05E+00	6.55E+00	7.06E−01	7.63E−02	3.23E−02	2.20E−02	8.46E−03
75.00	7.70E+00	5.63E+00	6.13E−01	6.19E−02	2.81E−02	1.93E−02	7.08E−03
80.00	6.66E+00	4.90E+00	5.44E−01	5.26E−02	2.54E−02	1.75E−02	6.12E−03
85.00	5.85E+00	4.34E+00	4.92E−01	4.66E−02	2.35E−02	1.62E−02	5.45E−03
90.00	5.23E+00	3.91E+00	4.52E−01	4.29E−02	2.23E−02	1.53E−02	4.98E−03
95.00	4.76E+00	3.57E+00	4.23E−01	4.06E−02	2.15E−02	1.48E−02	4.65E−03
105.00	4.14E+00	3.12E+00	3.89E−01	3.87E−02	2.07E−02	1.41E−02	4.23E−03
120.00	3.70E+00	2.82E+00	3.73E−01	3.92E−02	2.06E−02	1.38E−02	3.88E−03
135.00	3.56E+00	2.72E+00	3.77E−01	4.08E−02	2.08E−02	1.38E−02	3.68E−03
150.00	3.54E+00	2.72E+00	3.87E−01	4.24E−02	2.10E−02	1.37E−02	3.55E−03
165.00	3.55E+00	2.73E+00	3.96E−01	4.34E−02	2.11E−02	1.37E−02	3.48E−03
180.00	3.56E+00	2.74E+00	3.99E−01	4.38E−02	2.12E−02	1.37E−02	3.45E−03
total	2.72E+02	2.14E+02	4.70E+01	1.15E+01	6.94E+00	5.39E+00	2.72E+00
rel ff	2.91E+02	2.21E+02	4.78E+01	1.15E+01	7.06E+00	5.54E+00	2.85E+00
nrl ff	3.12E+02	2.38E+02	5.41E+01	1.33E+01	8.24E+00	6.48E+00	3.36E+00

TABLE 1. Predicted *S*-matrix differential elastic scattering cross sections for photon energies (50.0, 59.54, 145.4, 316.5, 411.8, 468.1, 661.6, 778.9, 964.0, 1004.8, 1112.1, 1274.5, 1408.0 and 1500.0). The angle integrated total cross sections for each element and energies are presented. ''total'' represents total cross sections from this work, ''rel ff'' represents total cross sections calculated from the relativistic form factor and ''nrl ff'' represents total cross sections calculated from the nonrelativistic form factor—Continued[a]

θ (deg)	Photon energy (keV)						
	778.9	964.0	1004.8	1112.1	1274.5	1408.0	1500.0
Neptunium ($Z=93$)							
0.00	6.67E+02	6.67E+02	6.67E+02	6.67E+02	6.66E+02	6.66E+02	6.65E+02
0.01	6.66E+02	6.66E+02	6.66E+02	6.65E+02	6.65E+02	6.64E+02	6.63E+02
0.02	6.66E+02	6.65E+02	6.64E+02	6.64E+02	6.62E+02	6.60E+02	6.59E+02
0.04	6.61E+02	6.58E+02	6.57E+02	6.55E+02	6.51E+02	6.47E+02	6.44E+02
0.06	6.54E+02	6.47E+02	6.46E+02	6.41E+02	6.34E+02	6.28E+02	6.24E+02
0.10	6.34E+02	6.19E+02	6.16E+02	6.07E+02	5.93E+02	5.82E+02	5.74E+02
0.20	5.70E+02	5.39E+02	5.32E+02	5.14E+02	4.88E+02	4.68E+02	4.55E+02
0.30	5.06E+02	4.62E+02	4.53E+02	4.29E+02	3.95E+02	3.69E+02	3.52E+02
0.40	4.46E+02	3.94E+02	3.83E+02	3.56E+02	3.21E+02	2.95E+02	2.80E+02
0.50	3.92E+02	3.36E+02	3.25E+02	2.98E+02	2.64E+02	2.40E+02	2.27E+02
0.60	3.45E+02	2.89E+02	2.78E+02	2.52E+02	2.19E+02	1.97E+02	1.84E+02
0.70	3.05E+02	2.50E+02	2.40E+02	2.15E+02	1.84E+02	1.63E+02	1.50E+02
0.80	2.71E+02	2.18E+02	2.08E+02	1.85E+02	1.55E+02	1.35E+02	1.23E+02
1.00	2.16E+02	1.68E+02	1.59E+02	1.38E+02	1.13E+02	9.63E+01	8.63E+01
1.20	1.75E+02	1.31E+02	1.23E+02	1.05E+02	8.41E+01	7.06E+01	6.28E+01
1.50	1.29E+02	9.26E+01	8.63E+01	7.21E+01	5.54E+01	4.49E+01	3.89E+01
1.70	1.07E+02	7.48E+01	6.93E+01	5.69E+01	4.25E+01	3.34E+01	2.81E+01
2.00	8.19E+01	5.49E+01	5.05E+01	4.06E+01	2.93E+01	2.24E+01	1.85E+01
2.50	5.35E+01	3.35E+01	3.05E+01	2.41E+01	1.77E+01	1.44E+01	1.28E+01
3.00	3.59E+01	2.16E+01	1.96E+01	1.56E+01	1.22E+01	1.10E+01	1.10E+01
3.50	2.53E+01	1.55E+01	1.41E+01	1.14E+01	9.01E+00	8.07E+00	7.83E+00
4.00	1.89E+01	1.22E+01	1.12E+01	9.11E+00	6.79E+00	5.27E+00	4.33E+00
5.00	1.21E+01	8.20E+00	7.56E+00	5.98E+00	3.76E+00	2.16E+00	1.30E+00
6.00	8.32E+00	5.08E+00	4.57E+00	3.44E+00	2.13E+00	1.32E+00	8.91E−01
7.00	5.70E+00	3.00E+00	2.64E+00	1.94E+00	1.35E+00	1.13E+00	1.08E+00
8.00	3.89E+00	1.91E+00	1.67E+00	1.23E+00	9.59E−01	9.88E−01	1.17E+00
9.00	2.73E+00	1.38E+00	1.22E+00	9.26E−01	7.31E−01	7.37E−01	8.39E−01
10.00	2.01E+00	1.12E+00	1.01E+00	7.83E−01	5.77E−01	4.74E−01	4.23E−01
12.50	1.14E+00	7.51E−01	6.88E−01	5.32E−01	3.02E−01	1.45E−01	7.16E−02
15.00	7.46E−01	4.35E−01	3.86E−01	2.76E−01	1.45E−01	7.03E−02	3.70E−02
17.50	4.86E−01	2.30E−01	1.97E−01	1.32E−01	7.62E−02	5.09E−02	3.97E−02
20.00	3.08E−01	1.28E−01	1.07E−01	7.11E−02	4.66E−02	4.20E−02	4.57E−02
22.50	1.96E−01	7.95E−02	6.69E−02	4.56E−02	3.26E−02	3.31E−02	4.02E−02
25.00	1.29E−01	5.59E−02	4.79E−02	3.39E−02	2.47E−02	2.37E−02	2.63E−02
27.50	8.99E−02	4.30E−02	3.77E−02	2.77E−02	1.95E−02	1.59E−02	1.43E−02
30.00	6.58E−02	3.49E−02	3.11E−02	2.35E−02	1.55E−02	1.03E−02	7.36E−03
35.00	4.00E−02	2.38E−02	2.15E−02	1.63E−02	9.20E−03	4.45E−03	2.22E−03
40.00	2.70E−02	1.58E−02	1.42E−02	1.02E−02	5.15E−03	2.16E−03	9.51E−04
45.00	1.90E−02	1.03E−02	8.98E−03	6.10E−03	2.86E−03	1.19E−03	5.41E−04
50.00	1.37E−02	6.63E−03	5.64E−03	3.61E−03	1.63E−03	7.15E−04	3.58E−04
55.00	9.97E−03	4.38E−03	3.65E−03	2.24E−03	1.01E−03	4.83E−04	2.74E−04
60.00	7.41E−03	3.03E−03	2.49E−03	1.50E−03	6.96E−04	3.71E−04	2.39E−04
65.00	5.66E−03	2.20E−03	1.80E−03	1.08E−03	5.23E−04	3.07E−04	2.21E−04
70.00	4.49E−03	1.71E−03	1.40E−03	8.41E−04	4.28E−04	2.73E−04	2.14E−04
75.00	3.71E−03	1.41E−03	1.15E−03	7.02E−04	3.73E−04	2.52E−04	2.08E−04
80.00	3.18E−03	1.21E−03	9.94E−04	6.15E−04	3.37E−04	2.36E−04	2.01E−04
85.00	2.82E−03	1.08E−03	8.92E−04	5.59E−04	3.13E−04	2.24E−04	1.94E−04
90.00	2.57E−03	9.96E−04	8.24E−04	5.22E−04	2.97E−04	2.15E−04	1.87E−04
95.00	2.40E−03	9.34E−04	7.75E−04	4.94E−04	2.85E−04	2.07E−04	1.80E−04
105.00	2.16E−03	8.52E−04	7.09E−04	4.57E−04	2.68E−04	1.96E−04	1.70E−04
120.00	1.97E−03	7.76E−04	6.49E−04	4.24E−04	2.53E−04	1.87E−04	1.63E−04
135.00	1.85E−03	7.36E−04	6.17E−04	4.07E−04	2.47E−04	1.84E−04	1.60E−04
150.00	1.78E−03	7.10E−04	5.97E−04	3.98E−04	2.45E−04	1.84E−04	1.60E−04
165.00	1.73E−03	6.97E−04	5.88E−04	3.94E−04	2.45E−04	1.86E−04	1.63E−04
180.00	1.72E−03	6.93E−04	5.85E−04	3.93E−04	2.46E−04	1.87E−04	1.64E−04
total	1.96E+00	1.28E+00	1.18E+00	9.64E−01	7.28E−01	5.94E−01	5.29E−01
rel ff	2.08E+00	1.38E+00	1.27E+00	1.04E+00	7.94E−01	6.55E−01	5.79E−01
nrl ff	2.46E+00	1.63E+00	1.50E+00	1.23E+00	9.41E−01	7.76E−01	6.87E−01

TABLE 1. Predicted *S*-matrix differential elastic scattering cross sections for photon energies (50.0, 59.54, 145.4, 316.5, 411.8, 468.1, 661.6, 778.9, 964.0, 1004.8, 1112.1, 1274.5, 1408.0 and 1500.0). The angle integrated total cross sections for each element and energies are presented. ''total'' represents total cross sections from this work, ''rel ff'' represents total cross sections calculated from the relativistic form factor and ''nrl ff'' represents total cross sections calculated from the nonrelativistic form factor—Continued[a]

θ (deg)	Photon energy (keV)						
	50.0	59.5	145.4	316.5	411.8	468.1	661.6
Plutonium ($Z=94$)							
0.00	6.83E+02	6.81E+02	6.76E+02	6.84E+02	6.83E+02	6.83E+02	6.82E+02
0.01	6.83E+02	6.81E+02	6.76E+02	6.84E+02	6.83E+02	6.82E+02	6.81E+02
0.02	6.83E+02	6.81E+02	6.76E+02	6.84E+02	6.82E+02	6.82E+02	6.80E+02
0.04	6.83E+02	6.81E+02	6.76E+02	6.83E+02	6.82E+02	6.81E+02	6.77E+02
0.06	6.83E+02	6.81E+02	6.75E+02	6.82E+02	6.79E+02	6.78E+02	6.72E+02
0.10	6.82E+02	6.81E+02	6.75E+02	6.78E+02	6.72E+02	6.69E+02	6.57E+02
0.20	6.82E+02	6.80E+02	6.71E+02	6.61E+02	6.46E+02	6.37E+02	6.03E+02
0.30	6.82E+02	6.79E+02	6.64E+02	6.37E+02	6.12E+02	5.97E+02	5.47E+02
0.40	6.80E+02	6.78E+02	6.56E+02	6.10E+02	5.77E+02	5.58E+02	4.93E+02
0.50	6.79E+02	6.76E+02	6.46E+02	5.83E+02	5.42E+02	5.19E+02	4.42E+02
0.60	6.78E+02	6.73E+02	6.35E+02	5.57E+02	5.09E+02	4.81E+02	3.96E+02
0.70	6.76E+02	6.70E+02	6.23E+02	5.30E+02	4.76E+02	4.46E+02	3.55E+02
0.80	6.74E+02	6.67E+02	6.11E+02	5.04E+02	4.44E+02	4.12E+02	3.20E+02
1.00	6.69E+02	6.60E+02	5.86E+02	4.55E+02	3.88E+02	3.54E+02	2.62E+02
1.20	6.63E+02	6.52E+02	5.62E+02	4.10E+02	3.39E+02	3.05E+02	2.17E+02
1.50	6.52E+02	6.38E+02	5.25E+02	3.51E+02	2.80E+02	2.47E+02	1.66E+02
1.70	6.44E+02	6.28E+02	5.02E+02	3.17E+02	2.48E+02	2.16E+02	1.40E+02
2.00	6.32E+02	6.13E+02	4.67E+02	2.74E+02	2.08E+02	1.79E+02	1.10E+02
2.50	6.12E+02	5.88E+02	4.13E+02	2.18E+02	1.58E+02	1.33E+02	7.61E+01
3.00	5.92E+02	5.63E+02	3.66E+02	1.76E+02	1.22E+02	1.00E+02	5.36E+01
3.50	5.71E+02	5.37E+02	3.25E+02	1.44E+02	9.64E+01	7.70E+01	3.81E+01
4.00	5.50E+02	5.13E+02	2.90E+02	1.18E+02	7.69E+01	6.00E+01	2.78E+01
5.00	5.07E+02	4.65E+02	2.33E+02	8.22E+01	4.98E+01	3.77E+01	1.70E+01
6.00	4.65E+02	4.20E+02	1.90E+02	5.84E+01	3.29E+01	2.49E+01	1.21E+01
7.00	4.26E+02	3.80E+02	1.56E+02	4.25E+01	2.29E+01	1.75E+01	9.03E+00
8.00	3.90E+02	3.44E+02	1.29E+02	3.16E+01	1.72E+01	1.31E+01	6.56E+00
9.00	3.57E+02	3.12E+02	1.08E+02	2.42E+01	1.38E+01	1.04E+01	4.65E+00
10.00	3.27E+02	2.84E+02	9.11E+01	1.91E+01	1.14E+01	8.40E+00	3.31E+00
12.50	2.69E+02	2.27E+02	6.07E+01	1.18E+01	7.08E+00	5.02E+00	1.71E+00
15.00	2.26E+02	1.83E+02	4.10E+01	8.09E+00	4.15E+00	2.93E+00	1.15E+00
17.50	1.91E+02	1.49E+02	2.83E+01	5.64E+00	2.52E+00	1.80E+00	8.23E−01
20.00	1.60E+02	1.22E+02	2.04E+01	3.92E+00	1.72E+00	1.23E+00	5.71E−01
22.50	1.33E+02	1.00E+02	1.55E+01	2.76E+00	1.30E+00	9.26E−01	3.82E−01
25.00	1.10E+02	8.36E+01	1.25E+01	2.00E+00	1.04E+00	7.30E−01	2.53E−01
27.50	9.16E+01	6.99E+01	1.03E+01	1.50E+00	8.42E−01	5.78E−01	1.70E−01
30.00	7.64E+01	5.86E+01	8.61E+00	1.18E+00	6.73E−01	4.52E−01	1.19E−01
35.00	5.42E+01	4.13E+01	5.94E+00	7.95E−01	4.10E−01	2.65E−01	6.72E−02
40.00	3.93E+01	2.93E+01	3.97E+00	5.59E−01	2.43E−01	1.55E−01	4.39E−02
45.00	2.91E+01	2.11E+01	2.64E+00	3.93E−01	1.48E−01	9.42E−02	3.13E−02
50.00	2.21E+01	1.57E+01	1.82E+00	2.75E−01	9.57E−02	6.16E−02	2.32E−02
55.00	1.72E+01	1.21E+01	1.32E+00	1.94E−01	6.67E−02	4.36E−02	1.76E−02
60.00	1.38E+01	9.71E+00	1.02E+00	1.39E−01	4.99E−02	3.31E−02	1.37E−02
65.00	1.13E+01	7.99E+00	8.29E−01	1.03E−01	3.97E−02	2.67E−02	1.08E−02
70.00	9.41E+00	6.74E+00	7.00E−01	7.99E−02	3.32E−02	2.26E−02	8.80E−03
75.00	8.01E+00	5.79E+00	6.07E−01	6.47E−02	2.89E−02	1.98E−02	7.39E−03
80.00	6.94E+00	5.06E+00	5.39E−01	5.49E−02	2.61E−02	1.79E−02	6.41E−03
85.00	6.11E+00	4.49E+00	4.88E−01	4.86E−02	2.41E−02	1.67E−02	5.73E−03
90.00	5.48E+00	4.05E+00	4.50E−01	4.46E−02	2.29E−02	1.58E−02	5.25E−03
95.00	5.00E+00	3.71E+00	4.22E−01	4.21E−02	2.21E−02	1.52E−02	4.91E−03
105.00	4.37E+00	3.26E+00	3.89E−01	4.01E−02	2.14E−02	1.47E−02	4.48E−03
120.00	3.93E+00	2.96E+00	3.73E−01	4.05E−02	2.13E−02	1.44E−02	4.13E−03
135.00	3.79E+00	2.87E+00	3.77E−01	4.22E−02	2.16E−02	1.44E−02	3.92E−03
150.00	3.77E+00	2.86E+00	3.87E−01	4.39E−02	2.19E−02	1.44E−02	3.79E−03
165.00	3.79E+00	2.88E+00	3.94E−01	4.49E−02	2.20E−02	1.43E−02	3.71E−03
180.00	3.80E+00	2.89E+00	3.97E−01	4.53E−02	2.21E−02	1.43E−02	3.69E−03
total	2.82E+02	2.21E+02	4.79E+01	1.19E+01	7.14E+00	5.54E+00	2.80E+00
rel ff	2.99E+02	2.27E+02	4.92E+01	1.18E+01	7.27E+00	5.70E+00	2.94E+00
nrl ff	3.21E+02	2.45E+02	5.58E+01	1.38E+01	8.50E+00	6.69E+00	3.47E+00

TABLE 1. Predicted *S*-matrix differential elastic scattering cross sections for photon energies (50.0, 59.54, 145.4, 316.5, 411.8, 468.1, 661.6, 778.9, 964.0, 1004.8, 1112.1, 1274.5, 1408.0 and 1500.0). The angle integrated total cross sections for each element and energies are presented. ''total'' represents total cross sections from this work, ''rel ff'' represents total cross sections calculated from the relativistic form factor and ''nrl ff'' represents total cross sections calculated from the nonrelativistic form factor—Continued[a]

θ (deg)	Photon energy (keV)						
	778.9	964.0	1004.8	1112.1	1274.5	1408.0	1500.0
Plutonium ($Z=94$)							
0.00	6.82E+02	6.81E+02	6.81E+02	6.81E+02	6.80E+02	6.80E+02	6.79E+02
0.01	6.81E+02	6.80E+02	6.80E+02	6.80E+02	6.79E+02	6.78E+02	6.77E+02
0.02	6.80E+02	6.79E+02	6.78E+02	6.78E+02	6.76E+02	6.74E+02	6.72E+02
0.04	6.75E+02	6.72E+02	6.71E+02	6.68E+02	6.64E+02	6.61E+02	6.58E+02
0.06	6.68E+02	6.61E+02	6.59E+02	6.55E+02	6.48E+02	6.41E+02	6.37E+02
0.10	6.48E+02	6.33E+02	6.29E+02	6.20E+02	6.06E+02	5.95E+02	5.87E+02
0.20	5.83E+02	5.51E+02	5.44E+02	5.26E+02	4.99E+02	4.79E+02	4.65E+02
0.30	5.18E+02	4.73E+02	4.64E+02	4.39E+02	4.05E+02	3.78E+02	3.60E+02
0.40	4.56E+02	4.03E+02	3.92E+02	3.65E+02	3.28E+02	3.02E+02	2.86E+02
0.50	4.01E+02	3.44E+02	3.32E+02	3.05E+02	2.70E+02	2.46E+02	2.32E+02
0.60	3.53E+02	2.95E+02	2.84E+02	2.58E+02	2.24E+02	2.01E+02	1.88E+02
0.70	3.12E+02	2.56E+02	2.45E+02	2.20E+02	1.88E+02	1.66E+02	1.53E+02
0.80	2.77E+02	2.23E+02	2.13E+02	1.89E+02	1.59E+02	1.38E+02	1.26E+02
1.00	2.21E+02	1.71E+02	1.63E+02	1.42E+02	1.16E+02	9.88E+01	8.88E+01
1.20	1.78E+02	1.34E+02	1.26E+02	1.08E+02	8.64E+01	7.27E+01	6.48E+01
1.50	1.32E+02	9.51E+01	8.87E+01	7.42E+01	5.72E+01	4.64E+01	4.03E+01
1.70	1.10E+02	7.69E+01	7.14E+01	5.87E+01	4.39E+01	3.45E+01	2.91E+01
2.00	8.42E+01	5.68E+01	5.22E+01	4.20E+01	3.03E+01	2.31E+01	1.90E+01
2.50	5.53E+01	3.47E+01	3.16E+01	2.49E+01	1.82E+01	1.46E+01	1.29E+01
3.00	3.72E+01	2.23E+01	2.02E+01	1.61E+01	1.25E+01	1.12E+01	1.11E+01
3.50	2.62E+01	1.59E+01	1.44E+01	1.16E+01	9.22E+00	8.34E+00	8.19E+00
4.00	1.94E+01	1.24E+01	1.14E+01	9.28E+00	6.97E+00	5.52E+00	4.64E+00
5.00	1.24E+01	8.41E+00	7.75E+00	6.16E+00	3.90E+00	2.27E+00	1.38E+00
6.00	8.54E+00	5.28E+00	4.76E+00	3.60E+00	2.22E+00	1.35E+00	8.87E−01
7.00	5.88E+00	3.14E+00	2.77E+00	2.04E+00	1.40E+00	1.14E+00	1.05E+00
8.00	4.03E+00	1.98E+00	1.73E+00	1.28E+00	9.87E−01	1.00E+00	1.18E+00
9.00	2.83E+00	1.42E+00	1.25E+00	9.49E−01	7.51E−01	7.66E−01	8.85E−01
10.00	2.08E+00	1.15E+00	1.03E+00	7.96E−01	5.93E−01	5.02E−01	4.64E−01
12.50	1.17E+00	7.71E−01	7.07E−01	5.48E−01	3.15E−01	1.54E−01	7.79E−02
15.00	7.69E−01	4.54E−01	4.05E−01	2.91E−01	1.53E−01	7.28E−02	3.74E−02
17.50	5.04E−01	2.43E−01	2.08E−01	1.40E−01	7.99E−02	5.16E−02	3.87E−02
20.00	3.22E−01	1.34E−01	1.13E−01	7.49E−02	4.84E−02	4.24E−02	4.48E−02
22.50	2.05E−01	8.31E−02	6.98E−02	4.73E−02	3.35E−02	3.37E−02	4.08E−02
25.00	1.36E−01	5.78E−02	4.94E−02	3.48E−02	2.53E−02	2.45E−02	2.77E−02
27.50	9.39E−02	4.42E−02	3.85E−02	2.82E−02	1.99E−02	1.66E−02	1.55E−02
30.00	6.84E−02	3.56E−02	3.16E−02	2.38E−02	1.58E−02	1.09E−02	8.07E−03
35.00	4.12E−02	2.43E−02	2.19E−02	1.66E−02	9.53E−03	4.74E−03	2.43E−03
40.00	2.77E−02	1.63E−02	1.46E−02	1.06E−02	5.42E−03	2.31E−03	1.02E−03
45.00	1.96E−02	1.07E−02	9.37E−03	6.43E−03	3.05E−03	1.27E−03	5.76E−04
50.00	1.41E−02	6.95E−03	5.94E−03	3.84E−03	1.75E−03	7.67E−04	3.81E−04
55.00	1.03E−02	4.62E−03	3.87E−03	2.40E−03	1.09E−03	5.20E−04	2.91E−04
60.00	7.71E−03	3.21E−03	2.66E−03	1.61E−03	7.56E−04	3.99E−04	2.54E−04
65.00	5.92E−03	2.35E−03	1.93E−03	1.17E−03	5.69E−04	3.31E−04	2.35E−04
70.00	4.71E−03	1.83E−03	1.50E−03	9.11E−04	4.65E−04	2.94E−04	2.28E−04
75.00	3.91E−03	1.51E−03	1.24E−03	7.61E−04	4.05E−04	2.72E−04	2.22E−04
80.00	3.37E−03	1.30E−03	1.07E−03	6.66E−04	3.66E−04	2.55E−04	2.16E−04
85.00	2.99E−03	1.16E−03	9.62E−04	6.05E−04	3.40E−04	2.42E−04	2.08E−04
90.00	2.74E−03	1.07E−03	8.90E−04	5.65E−04	3.22E−04	2.32E−04	2.00E−04
95.00	2.55E−03	1.01E−03	8.37E−04	5.36E−04	3.09E−04	2.23E−04	1.93E−04
105.00	2.31E−03	9.19E−04	7.66E−04	4.96E−04	2.90E−04	2.11E−04	1.82E−04
120.00	2.11E−03	8.39E−04	7.02E−04	4.58E−04	2.73E−04	2.01E−04	1.74E−04
135.00	1.99E−03	7.95E−04	6.67E−04	4.41E−04	2.67E−04	1.98E−04	1.71E−04
150.00	1.91E−03	7.67E−04	6.46E−04	4.30E−04	2.64E−04	1.97E−04	1.71E−04
165.00	1.86E−03	7.53E−04	6.35E−04	4.25E−04	2.64E−04	1.99E−04	1.74E−04
180.00	1.85E−03	7.48E−04	6.31E−04	4.24E−04	2.64E−04	2.00E−04	1.75E−04
total	2.02E+00	1.32E+00	1.22E+00	9.93E−01	7.50E−01	6.11E−01	5.45E−01
rel ff	2.15E+00	1.42E+00	1.31E+00	1.07E+00	8.18E−01	6.75E−01	5.97E−01
nrl ff	2.54E+00	1.68E+00	1.55E+00	1.27E+00	9.73E−01	8.03E−01	7.11E−01

TABLE 1. Predicted *S*-matrix differential elastic scattering cross sections for photon energies (50.0, 59.54, 145.4, 316.5, 411.8, 468.1, 661.6, 778.9, 964.0, 1004.8, 1112.1, 1274.5, 1408.0 and 1500.0). The angle integrated total cross sections for each element and energies are presented. ''total'' represents total cross sections from this work, ''rel ff'' represents total cross sections calculated from the relativistic form factor and ''nrl ff'' represents total cross sections calculated from the nonrelativistic form factor—Continued[a]

θ (deg)	Photon energy (keV)						
	50.0	59.5	145.4	316.5	411.8	468.1	661.6
Americium ($Z=95$)							
0.00	6.98E+02	6.96E+02	6.89E+02	6.99E+02	6.97E+02	6.97E+02	6.96E+02
0.01	6.98E+02	6.96E+02	6.89E+02	6.98E+02	6.97E+02	6.97E+02	6.95E+02
0.02	6.98E+02	6.96E+02	6.89E+02	6.98E+02	6.97E+02	6.96E+02	6.95E+02
0.04	6.98E+02	6.96E+02	6.88E+02	6.98E+02	6.96E+02	6.95E+02	6.91E+02
0.06	6.98E+02	6.96E+02	6.88E+02	6.96E+02	6.93E+02	6.92E+02	6.86E+02
0.10	6.97E+02	6.95E+02	6.88E+02	6.92E+02	6.87E+02	6.83E+02	6.71E+02
0.20	6.97E+02	6.95E+02	6.84E+02	6.75E+02	6.60E+02	6.50E+02	6.17E+02
0.30	6.97E+02	6.94E+02	6.77E+02	6.51E+02	6.25E+02	6.10E+02	5.60E+02
0.40	6.95E+02	6.92E+02	6.68E+02	6.24E+02	5.90E+02	5.70E+02	5.05E+02
0.50	6.94E+02	6.90E+02	6.59E+02	5.96E+02	5.55E+02	5.31E+02	4.53E+02
0.60	6.93E+02	6.88E+02	6.47E+02	5.69E+02	5.20E+02	4.93E+02	4.06E+02
0.70	6.91E+02	6.85E+02	6.36E+02	5.43E+02	4.87E+02	4.56E+02	3.64E+02
0.80	6.89E+02	6.82E+02	6.23E+02	5.16E+02	4.55E+02	4.22E+02	3.27E+02
1.00	6.84E+02	6.74E+02	5.98E+02	4.66E+02	3.97E+02	3.62E+02	2.68E+02
1.20	6.78E+02	6.66E+02	5.73E+02	4.19E+02	3.47E+02	3.12E+02	2.21E+02
1.50	6.66E+02	6.52E+02	5.36E+02	3.59E+02	2.87E+02	2.53E+02	1.69E+02
1.70	6.59E+02	6.42E+02	5.12E+02	3.25E+02	2.54E+02	2.21E+02	1.43E+02
2.00	6.46E+02	6.27E+02	4.77E+02	2.80E+02	2.13E+02	1.83E+02	1.13E+02
2.50	6.26E+02	6.01E+02	4.22E+02	2.23E+02	1.62E+02	1.36E+02	7.83E+01
3.00	6.06E+02	5.76E+02	3.74E+02	1.80E+02	1.25E+02	1.03E+02	5.53E+01
3.50	5.85E+02	5.50E+02	3.32E+02	1.47E+02	9.89E+01	7.92E+01	3.94E+01
4.00	5.64E+02	5.25E+02	2.96E+02	1.21E+02	7.91E+01	6.18E+01	2.87E+01
5.00	5.20E+02	4.76E+02	2.38E+02	8.44E+01	5.14E+01	3.90E+01	1.74E+01
6.00	4.78E+02	4.31E+02	1.93E+02	6.02E+01	3.40E+01	2.58E+01	1.24E+01
7.00	4.38E+02	3.89E+02	1.59E+02	4.39E+01	2.36E+01	1.80E+01	9.25E+00
8.00	4.00E+02	3.52E+02	1.32E+02	3.27E+01	1.77E+01	1.35E+01	6.77E+00
9.00	3.66E+02	3.20E+02	1.10E+02	2.50E+01	1.41E+01	1.06E+01	4.83E+00
10.00	3.36E+02	2.91E+02	9.30E+01	1.96E+01	1.16E+01	8.60E+00	3.45E+00
12.50	2.75E+02	2.32E+02	6.22E+01	1.21E+01	7.29E+00	5.18E+00	1.76E+00
15.00	2.31E+02	1.87E+02	4.21E+01	8.29E+00	4.31E+00	3.05E+00	1.17E+00
17.50	1.95E+02	1.52E+02	2.90E+01	5.80E+00	2.62E+00	1.87E+00	8.45E−01
20.00	1.64E+02	1.25E+02	2.08E+01	4.06E+00	1.77E+00	1.27E+00	5.92E−01
22.50	1.37E+02	1.03E+02	1.58E+01	2.86E+00	1.33E+00	9.51E−01	3.99E−01
25.00	1.14E+02	8.59E+01	1.26E+01	2.07E+00	1.06E+00	7.49E−01	2.65E−01
27.50	9.49E+01	7.20E+01	1.04E+01	1.56E+00	8.63E−01	5.94E−01	1.79E−01
30.00	7.94E+01	6.05E+01	8.67E+00	1.22E+00	6.93E−01	4.67E−01	1.25E−01
35.00	5.64E+01	4.28E+01	6.00E+00	8.16E−01	4.27E−01	2.77E−01	6.98E−02
40.00	4.09E+01	3.04E+01	4.03E+00	5.76E−01	2.55E−01	1.62E−01	4.52E−02
45.00	3.03E+01	2.19E+01	2.68E+00	4.07E−01	1.55E−01	9.88E−02	3.21E−02
50.00	2.30E+01	1.63E+01	1.84E+00	2.86E−01	1.00E−01	6.44E−02	2.38E−02
55.00	1.79E+01	1.25E+01	1.33E+00	2.02E−01	6.95E−02	4.53E−02	1.81E−02
60.00	1.43E+01	1.00E+01	1.02E+00	1.46E−01	5.17E−02	3.42E−02	1.41E−02
65.00	1.17E+01	8.22E+00	8.23E−01	1.08E−01	4.10E−02	2.75E−02	1.12E−02
70.00	9.78E+00	6.92E+00	6.92E−01	8.37E−02	3.42E−02	2.32E−02	9.13E−03
75.00	8.33E+00	5.95E+00	6.00E−01	6.77E−02	2.97E−02	2.03E−02	7.70E−03
80.00	7.23E+00	5.20E+00	5.33E−01	5.73E−02	2.68E−02	1.84E−02	6.70E−03
85.00	6.38E+00	4.63E+00	4.83E−01	5.06E−02	2.48E−02	1.71E−02	6.01E−03
90.00	5.74E+00	4.19E+00	4.46E−01	4.63E−02	2.35E−02	1.63E−02	5.52E−03
95.00	5.25E+00	3.85E+00	4.19E−01	4.38E−02	2.28E−02	1.57E−02	5.17E−03
105.00	4.61E+00	3.40E+00	3.87E−01	4.16E−02	2.21E−02	1.52E−02	4.74E−03
120.00	4.17E+00	3.10E+00	3.72E−01	4.19E−02	2.21E−02	1.50E−02	4.38E−03
135.00	4.04E+00	3.02E+00	3.75E−01	4.37E−02	2.24E−02	1.50E−02	4.17E−03
150.00	4.03E+00	3.02E+00	3.84E−01	4.54E−02	2.28E−02	1.50E−02	4.04E−03
165.00	4.05E+00	3.04E+00	3.91E−01	4.65E−02	2.29E−02	1.50E−02	3.96E−03
180.00	4.06E+00	3.05E+00	3.93E−01	4.69E−02	2.30E−02	1.50E−02	3.93E−03
total	2.92E+02	2.27E+02	4.86E+01	1.22E+01	7.35E+00	5.70E+00	2.88E+00
rel ff	3.07E+02	2.33E+02	5.05E+01	1.22E+01	7.47E+00	5.86E+00	3.03E+00
nrl ff	3.30E+02	2.52E+02	5.75E+01	1.42E+01	8.77E+00	6.91E+00	3.59E+00

TABLE 1. Predicted *S*-matrix differential elastic scattering cross sections for photon energies (50.0, 59.54, 145.4, 316.5, 411.8, 468.1, 661.6, 778.9, 964.0, 1004.8, 1112.1, 1274.5, 1408.0 and 1500.0). The angle integrated total cross sections for each element and energies are presented. ''total'' represents total cross sections from this work, ''rel ff'' represents total cross sections calculated from the relativistic form factor and ''nrl ff'' represents total cross sections calculated from the nonrelativistic form factor—Continued[a]

θ (deg)	Photon energy (keV)						
	778.9	964.0	1004.8	1112.1	1274.5	1408.0	1500.0
Americium ($Z=95$)							
0.00	6.96E+02	6.95E+02	6.95E+02	6.95E+02	6.95E+02	6.94E+02	6.93E+02
0.01	6.95E+02	6.94E+02	6.94E+02	6.94E+02	6.93E+02	6.92E+02	6.91E+02
0.02	6.94E+02	6.93E+02	6.93E+02	6.92E+02	6.90E+02	6.88E+02	6.87E+02
0.04	6.89E+02	6.86E+02	6.85E+02	6.83E+02	6.78E+02	6.75E+02	6.72E+02
0.06	6.82E+02	6.75E+02	6.73E+02	6.69E+02	6.61E+02	6.55E+02	6.51E+02
0.10	6.62E+02	6.46E+02	6.43E+02	6.33E+02	6.19E+02	6.08E+02	6.00E+02
0.20	5.96E+02	5.63E+02	5.56E+02	5.38E+02	5.11E+02	4.90E+02	4.76E+02
0.30	5.30E+02	4.84E+02	4.75E+02	4.50E+02	4.14E+02	3.87E+02	3.69E+02
0.40	4.67E+02	4.13E+02	4.02E+02	3.74E+02	3.36E+02	3.09E+02	2.93E+02
0.50	4.11E+02	3.52E+02	3.40E+02	3.12E+02	2.76E+02	2.51E+02	2.37E+02
0.60	3.61E+02	3.02E+02	2.91E+02	2.64E+02	2.29E+02	2.06E+02	1.92E+02
0.70	3.19E+02	2.62E+02	2.51E+02	2.25E+02	1.92E+02	1.70E+02	1.57E+02
0.80	2.83E+02	2.28E+02	2.18E+02	1.93E+02	1.62E+02	1.42E+02	1.29E+02
1.00	2.26E+02	1.75E+02	1.66E+02	1.45E+02	1.19E+02	1.01E+02	9.13E+01
1.20	1.82E+02	1.37E+02	1.29E+02	1.11E+02	8.87E+01	7.48E+01	6.69E+01
1.50	1.35E+02	9.75E+01	9.10E+01	7.63E+01	5.90E+01	4.80E+01	4.18E+01
1.70	1.12E+02	7.91E+01	7.35E+01	6.06E+01	4.55E+01	3.58E+01	3.02E+01
2.00	8.65E+01	5.86E+01	5.39E+01	4.35E+01	3.14E+01	2.38E+01	1.96E+01
2.50	5.71E+01	3.60E+01	3.27E+01	2.58E+01	1.87E+01	1.49E+01	1.30E+01
3.00	3.85E+01	2.31E+01	2.09E+01	1.65E+01	1.28E+01	1.14E+01	1.13E+01
3.50	2.70E+01	1.63E+01	1.48E+01	1.19E+01	9.44E+00	8.60E+00	8.53E+00
4.00	2.00E+01	1.27E+01	1.16E+01	9.44E+00	7.15E+00	5.78E+00	4.97E+00
5.00	1.27E+01	8.61E+00	7.94E+00	6.32E+00	4.04E+00	2.38E+00	1.46E+00
6.00	8.77E+00	5.48E+00	4.95E+00	3.76E+00	2.30E+00	1.38E+00	8.88E−01
7.00	6.07E+00	3.28E+00	2.90E+00	2.14E+00	1.45E+00	1.14E+00	1.02E+00
8.00	4.18E+00	2.07E+00	1.81E+00	1.33E+00	1.02E+00	1.02E+00	1.17E+00
9.00	2.94E+00	1.47E+00	1.29E+00	9.74E−01	7.72E−01	7.93E−01	9.27E−01
10.00	2.16E+00	1.17E+00	1.05E+00	8.10E−01	6.09E−01	5.31E−01	5.08E−01
12.50	1.21E+00	7.90E−01	7.24E−01	5.63E−01	3.29E−01	1.65E−01	8.53E−02
15.00	7.91E−01	4.74E−01	4.24E−01	3.07E−01	1.61E−01	7.56E−02	3.81E−02
17.50	5.22E−01	2.56E−01	2.20E−01	1.49E−01	8.39E−02	5.24E−02	3.77E−02
20.00	3.36E−01	1.42E−01	1.19E−01	7.90E−02	5.03E−02	4.28E−02	4.38E−02
22.50	2.15E−01	8.70E−02	7.30E−02	4.92E−02	3.45E−02	3.43E−02	4.12E−02
25.00	1.42E−01	5.99E−02	5.10E−02	3.57E−02	2.59E−02	2.53E−02	2.90E−02
27.50	9.81E−02	4.54E−02	3.94E−02	2.86E−02	2.03E−02	1.74E−02	1.67E−02
30.00	7.12E−02	3.64E−02	3.22E−02	2.41E−02	1.62E−02	1.15E−02	8.85E−03
35.00	4.25E−02	2.48E−02	2.24E−02	1.70E−02	9.86E−03	5.04E−03	2.66E−03
40.00	2.84E−02	1.68E−02	1.51E−02	1.10E−02	5.69E−03	2.46E−03	1.10E−03
45.00	2.01E−02	1.11E−02	9.76E−03	6.76E−03	3.24E−03	1.36E−03	6.14E−04
50.00	1.45E−02	7.27E−03	6.25E−03	4.09E−03	1.88E−03	8.22E−04	4.04E−04
55.00	1.07E−02	4.88E−03	4.10E−03	2.57E−03	1.18E−03	5.59E−04	3.09E−04
60.00	8.01E−03	3.41E−03	2.83E−03	1.74E−03	8.19E−04	4.30E−04	2.70E−04
65.00	6.18E−03	2.51E−03	2.07E−03	1.26E−03	6.17E−04	3.57E−04	2.51E−04
70.00	4.95E−03	1.95E−03	1.61E−03	9.85E−04	5.05E−04	3.18E−04	2.43E−04
75.00	4.12E−03	1.62E−03	1.33E−03	8.24E−04	4.40E−04	2.93E−04	2.37E−04
80.00	3.56E−03	1.40E−03	1.15E−03	7.22E−04	3.97E−04	2.75E−04	2.30E−04
85.00	3.17E−03	1.25E−03	1.04E−03	6.56E−04	3.69E−04	2.61E−04	2.22E−04
90.00	2.91E−03	1.15E−03	9.60E−04	6.12E−04	3.50E−04	2.50E−04	2.15E−04
95.00	2.72E−03	1.08E−03	9.03E−04	5.80E−04	3.35E−04	2.41E−04	2.07E−04
105.00	2.47E−03	9.91E−04	8.28E−04	5.37E−04	3.14E−04	2.28E−04	1.96E−04
120.00	2.25E−03	9.05E−04	7.58E−04	4.96E−04	2.95E−04	2.17E−04	1.87E−04
135.00	2.13E−03	8.59E−04	7.21E−04	4.76E−04	2.88E−04	2.12E−04	1.83E−04
150.00	2.05E−03	8.28E−04	6.97E−04	4.64E−04	2.84E−04	2.12E−04	1.83E−04
165.00	2.00E−03	8.13E−04	6.86E−04	4.59E−04	2.84E−04	2.13E−04	1.85E−04
180.00	1.99E−03	8.08E−04	6.82E−04	4.58E−04	2.84E−04	2.14E−04	1.87E−04
total	2.08E+00	1.36E+00	1.25E+00	1.02E+00	7.72E−01	6.29E−01	5.61E−01
rel ff	2.21E+00	1.46E+00	1.35E+00	1.10E+00	8.43E−01	6.95E−01	6.15E−01
nrl ff	2.62E+00	1.74E+00	1.60E+00	1.31E+00	1.01E+00	8.30E−01	7.35E−01

TABLE 1. Predicted *S*-matrix differential elastic scattering cross sections for photon energies (50.0, 59.54, 145.4, 316.5, 411.8, 468.1, 661.6, 778.9, 964.0, 1004.8, 1112.1, 1274.5, 1408.0 and 1500.0). The angle integrated total cross sections for each element and energies are presented. ''total'' represents total cross sections from this work, ''rel ff'' represents total cross sections calculated from the relativistic form factor and ''nrl ff'' represents total cross sections calculated from the nonrelativistic form factor—Continued[a]

θ (deg)	Photon energy (keV)						
	50.0	59.5	145.4	316.5	411.8	468.1	661.6
Curium ($Z=96$)							
0.00	7.13E+02	7.11E+02	7.02E+02	7.13E+02	7.12E+02	7.11E+02	7.11E+02
0.01	7.13E+02	7.11E+02	7.01E+02	7.13E+02	7.11E+02	7.11E+02	7.10E+02
0.02	7.13E+02	7.11E+02	7.01E+02	7.13E+02	7.11E+02	7.11E+02	7.09E+02
0.04	7.13E+02	7.10E+02	7.01E+02	7.12E+02	7.10E+02	7.09E+02	7.06E+02
0.06	7.13E+02	7.10E+02	7.01E+02	7.11E+02	7.08E+02	7.06E+02	7.01E+02
0.10	7.13E+02	7.10E+02	7.00E+02	7.07E+02	7.01E+02	6.98E+02	6.85E+02
0.20	7.12E+02	7.09E+02	6.96E+02	6.89E+02	6.74E+02	6.65E+02	6.31E+02
0.30	7.12E+02	7.09E+02	6.89E+02	6.65E+02	6.39E+02	6.24E+02	5.73E+02
0.40	7.11E+02	7.07E+02	6.81E+02	6.38E+02	6.03E+02	5.84E+02	5.17E+02
0.50	7.09E+02	7.05E+02	6.71E+02	6.10E+02	5.68E+02	5.43E+02	4.64E+02
0.60	7.08E+02	7.02E+02	6.60E+02	5.83E+02	5.33E+02	5.05E+02	4.16E+02
0.70	7.06E+02	6.99E+02	6.48E+02	5.55E+02	4.99E+02	4.67E+02	3.73E+02
0.80	7.04E+02	6.96E+02	6.35E+02	5.28E+02	4.66E+02	4.32E+02	3.35E+02
1.00	6.99E+02	6.89E+02	6.10E+02	4.77E+02	4.07E+02	3.71E+02	2.74E+02
1.20	6.93E+02	6.81E+02	5.85E+02	4.30E+02	3.55E+02	3.19E+02	2.26E+02
1.50	6.81E+02	6.67E+02	5.48E+02	3.68E+02	2.93E+02	2.58E+02	1.73E+02
1.70	6.73E+02	6.57E+02	5.23E+02	3.32E+02	2.59E+02	2.26E+02	1.46E+02
2.00	6.61E+02	6.41E+02	4.87E+02	2.87E+02	2.18E+02	1.87E+02	1.15E+02
2.50	6.41E+02	6.15E+02	4.31E+02	2.28E+02	1.65E+02	1.39E+02	8.05E+01
3.00	6.21E+02	5.89E+02	3.82E+02	1.84E+02	1.28E+02	1.05E+02	5.71E+01
3.50	6.00E+02	5.63E+02	3.39E+02	1.50E+02	1.01E+02	8.14E+01	4.08E+01
4.00	5.78E+02	5.38E+02	3.02E+02	1.24E+02	8.13E+01	6.37E+01	2.97E+01
5.00	5.34E+02	4.88E+02	2.42E+02	8.67E+01	5.31E+01	4.03E+01	1.79E+01
6.00	4.91E+02	4.41E+02	1.97E+02	6.21E+01	3.52E+01	2.66E+01	1.26E+01
7.00	4.50E+02	3.99E+02	1.61E+02	4.53E+01	2.44E+01	1.86E+01	9.47E+00
8.00	4.11E+02	3.61E+02	1.34E+02	3.37E+01	1.81E+01	1.38E+01	6.98E+00
9.00	3.76E+02	3.28E+02	1.12E+02	2.58E+01	1.44E+01	1.09E+01	5.01E+00
10.00	3.44E+02	2.98E+02	9.48E+01	2.02E+01	1.19E+01	8.80E+00	3.59E+00
12.50	2.81E+02	2.37E+02	6.37E+01	1.24E+01	7.50E+00	5.34E+00	1.82E+00
15.00	2.35E+02	1.91E+02	4.32E+01	8.49E+00	4.48E+00	3.16E+00	1.20E+00
17.50	1.99E+02	1.55E+02	2.98E+01	5.96E+00	2.72E+00	1.94E+00	8.67E−01
20.00	1.68E+02	1.28E+02	2.13E+01	4.19E+00	1.83E+00	1.31E+00	6.13E−01
22.50	1.41E+02	1.06E+02	1.60E+01	2.96E+00	1.37E+00	9.76E−01	4.16E−01
25.00	1.18E+02	8.83E+01	1.27E+01	2.14E+00	1.09E+00	7.67E−01	2.78E−01
27.50	9.83E+01	7.41E+01	1.04E+01	1.61E+00	8.83E−01	6.11E−01	1.88E−01
30.00	8.24E+01	6.24E+01	8.71E+00	1.26E+00	7.13E−01	4.82E−01	1.31E−01
35.00	5.87E+01	4.43E+01	6.05E+00	8.38E−01	4.44E−01	2.89E−01	7.25E−02
40.00	4.27E+01	3.15E+01	4.08E+00	5.92E−01	2.67E−01	1.70E−01	4.66E−02
45.00	3.16E+01	2.28E+01	2.72E+00	4.21E−01	1.63E−01	1.04E−01	3.28E−02
50.00	2.40E+01	1.69E+01	1.86E+00	2.98E−01	1.05E−01	6.73E−02	2.44E−02
55.00	1.86E+01	1.30E+01	1.33E+00	2.11E−01	7.25E−02	4.71E−02	1.86E−02
60.00	1.49E+01	1.03E+01	1.01E+00	1.53E−01	5.37E−02	3.54E−02	1.45E−02
65.00	1.22E+01	8.44E+00	8.14E−01	1.13E−01	4.23E−02	2.83E−02	1.15E−02
70.00	1.02E+01	7.10E+00	6.82E−01	8.77E−02	3.52E−02	2.38E−02	9.47E−03
75.00	8.66E+00	6.11E+00	5.90E−01	7.09E−02	3.05E−02	2.09E−02	8.02E−03
80.00	7.52E+00	5.35E+00	5.24E−01	5.99E−02	2.75E−02	1.89E−02	7.00E−03
85.00	6.66E+00	4.77E+00	4.76E−01	5.28E−02	2.55E−02	1.76E−02	6.29E−03
90.00	6.00E+00	4.32E+00	4.40E−01	4.82E−02	2.42E−02	1.68E−02	5.80E−03
95.00	5.50E+00	3.98E+00	4.14E−01	4.55E−02	2.34E−02	1.62E−02	5.45E−03
105.00	4.85E+00	3.54E+00	3.83E−01	4.31E−02	2.27E−02	1.57E−02	5.00E−03
120.00	4.42E+00	3.25E+00	3.69E−01	4.34E−02	2.28E−02	1.55E−02	4.65E−03
135.00	4.30E+00	3.17E+00	3.71E−01	4.52E−02	2.33E−02	1.56E−02	4.44E−03
150.00	4.30E+00	3.17E+00	3.78E−01	4.70E−02	2.36E−02	1.56E−02	4.30E−03
165.00	4.33E+00	3.20E+00	3.84E−01	4.82E−02	2.38E−02	1.57E−02	4.22E−03
180.00	4.35E+00	3.21E+00	3.87E−01	4.86E−02	2.39E−02	1.57E−02	4.19E−03
total	3.02E+02	2.34E+02	4.94E+01	1.25E+01	7.56E+00	5.87E+00	2.97E+00
rel ff	3.15E+02	2.39E+02	5.19E+01	1.25E+01	7.68E+00	6.03E+00	3.11E+00
nrl ff	3.39E+02	2.59E+02	5.92E+01	1.46E+01	9.04E+00	7.12E+00	3.70E+00

TABLE 1. Predicted *S*-matrix differential elastic scattering cross sections for photon energies (50.0, 59.54, 145.4, 316.5, 411.8, 468.1, 661.6, 778.9, 964.0, 1004.8, 1112.1, 1274.5, 1408.0 and 1500.0). The angle integrated total cross sections for each element and energies are presented. ''total'' represents total cross sections from this work, ''rel ff'' represents total cross sections calculated from the relativistic form factor and ''nrl ff'' represents total cross sections calculated from the nonrelativistic form factor—Continued[a]

θ (deg)	Photon energy (keV)						
	778.9	964.0	1004.8	1112.1	1274.5	1408.0	1500.0
Curium ($Z=96$)							
0.00	7.10E+02	7.10E+02	7.10E+02	7.09E+02	7.09E+02	7.08E+02	7.08E+02
0.01	7.09E+02	7.09E+02	7.09E+02	7.08E+02	7.07E+02	7.06E+02	7.05E+02
0.02	7.08E+02	7.07E+02	7.07E+02	7.06E+02	7.05E+02	7.03E+02	7.01E+02
0.04	7.04E+02	7.00E+02	6.99E+02	6.97E+02	6.93E+02	6.89E+02	6.86E+02
0.06	6.97E+02	6.89E+02	6.88E+02	6.83E+02	6.76E+02	6.69E+02	6.65E+02
0.10	6.76E+02	6.60E+02	6.57E+02	6.47E+02	6.33E+02	6.21E+02	6.14E+02
0.20	6.10E+02	5.77E+02	5.69E+02	5.51E+02	5.23E+02	5.02E+02	4.88E+02
0.30	5.42E+02	4.96E+02	4.86E+02	4.61E+02	4.24E+02	3.96E+02	3.78E+02
0.40	4.79E+02	4.23E+02	4.11E+02	3.83E+02	3.44E+02	3.16E+02	2.99E+02
0.50	4.21E+02	3.60E+02	3.49E+02	3.20E+02	2.82E+02	2.57E+02	2.42E+02
0.60	3.70E+02	3.09E+02	2.98E+02	2.70E+02	2.34E+02	2.10E+02	1.97E+02
0.70	3.27E+02	2.67E+02	2.56E+02	2.30E+02	1.96E+02	1.74E+02	1.61E+02
0.80	2.90E+02	2.33E+02	2.22E+02	1.97E+02	1.66E+02	1.45E+02	1.32E+02
1.00	2.31E+02	1.79E+02	1.70E+02	1.48E+02	1.21E+02	1.04E+02	9.38E+01
1.20	1.86E+02	1.40E+02	1.32E+02	1.13E+02	9.10E+01	7.70E+01	6.89E+01
1.50	1.38E+02	1.00E+02	9.34E+01	7.85E+01	6.09E+01	4.97E+01	4.32E+01
1.70	1.15E+02	8.13E+01	7.56E+01	6.25E+01	4.70E+01	3.71E+01	3.13E+01
2.00	8.88E+01	6.04E+01	5.57E+01	4.50E+01	3.25E+01	2.46E+01	2.01E+01
2.50	5.89E+01	3.73E+01	3.39E+01	2.68E+01	1.93E+01	1.52E+01	1.32E+01
3.00	3.98E+01	2.39E+01	2.16E+01	1.71E+01	1.31E+01	1.16E+01	1.14E+01
3.50	2.79E+01	1.67E+01	1.52E+01	1.22E+01	9.65E+00	8.84E+00	8.84E+00
4.00	2.06E+01	1.29E+01	1.18E+01	9.61E+00	7.33E+00	6.03E+00	5.31E+00
5.00	1.30E+01	8.80E+00	8.12E+00	6.48E+00	4.18E+00	2.50E+00	1.56E+00
6.00	8.99E+00	5.68E+00	5.14E+00	3.92E+00	2.39E+00	1.41E+00	8.92E−01
7.00	6.26E+00	3.43E+00	3.03E+00	2.24E+00	1.50E+00	1.15E+00	9.89E−01
8.00	4.33E+00	2.15E+00	1.88E+00	1.39E+00	1.05E+00	1.03E+00	1.16E+00
9.00	3.05E+00	1.52E+00	1.33E+00	1.00E+00	7.92E−01	8.18E−01	9.64E−01
10.00	2.23E+00	1.20E+00	1.07E+00	8.23E−01	6.26E−01	5.60E−01	5.54E−01
12.50	1.24E+00	8.08E−01	7.40E−01	5.77E−01	3.42E−01	1.76E−01	9.39E−02
15.00	8.13E−01	4.94E−01	4.43E−01	3.23E−01	1.70E−01	7.87E−02	3.90E−02
17.50	5.41E−01	2.70E−01	2.33E−01	1.59E−01	8.81E−02	5.32E−02	3.68E−02
20.00	3.50E−01	1.50E−01	1.26E−01	8.35E−02	5.24E−02	4.31E−02	4.27E−02
22.50	2.26E−01	9.12E−02	7.65E−02	5.13E−02	3.55E−02	3.48E−02	4.13E−02
25.00	1.49E−01	6.22E−02	5.28E−02	3.67E−02	2.65E−02	2.61E−02	3.02E−02
27.50	1.03E−01	4.66E−02	4.04E−02	2.91E−02	2.07E−02	1.81E−02	1.79E−02
30.00	7.41E−02	3.72E−02	3.28E−02	2.44E−02	1.65E−02	1.21E−02	9.69E−03
35.00	4.39E−02	2.53E−02	2.28E−02	1.73E−02	1.02E−02	5.36E−03	2.92E−03
40.00	2.92E−02	1.72E−02	1.55E−02	1.14E−02	5.97E−03	2.62E−03	1.19E−03
45.00	2.06E−02	1.15E−02	1.01E−02	7.09E−03	3.45E−03	1.45E−03	6.54E−04
50.00	1.49E−02	7.61E−03	6.56E−03	4.34E−03	2.02E−03	8.80E−04	4.28E−04
55.00	1.10E−02	5.13E−03	4.34E−03	2.75E−03	1.28E−03	6.01E−04	3.28E−04
60.00	8.31E−03	3.61E−03	3.01E−03	1.87E−03	8.88E−04	4.63E−04	2.87E−04
65.00	6.45E−03	2.67E−03	2.21E−03	1.36E−03	6.70E−04	3.85E−04	2.66E−04
70.00	5.19E−03	2.09E−03	1.72E−03	1.06E−03	5.48E−04	3.42E−04	2.59E−04
75.00	4.34E−03	1.73E−03	1.43E−03	8.91E−04	4.77E−04	3.16E−04	2.53E−04
80.00	3.76E−03	1.50E−03	1.24E−03	7.81E−04	4.31E−04	2.97E−04	2.46E−04
85.00	3.36E−03	1.35E−03	1.12E−03	7.10E−04	4.00E−04	2.82E−04	2.38E−04
90.00	3.09E−03	1.24E−03	1.03E−03	6.63E−04	3.79E−04	2.70E−04	2.30E−04
95.00	2.89E−03	1.17E−03	9.74E−04	6.28E−04	3.63E−04	2.60E−04	2.22E−04
105.00	2.63E−03	1.07E−03	8.94E−04	5.81E−04	3.40E−04	2.46E−04	2.10E−04
120.00	2.41E−03	9.77E−04	8.19E−04	5.37E−04	3.19E−04	2.33E−04	2.00E−04
135.00	2.28E−03	9.27E−04	7.79E−04	5.15E−04	3.10E−04	2.28E−04	1.96E−04
150.00	2.20E−03	8.94E−04	7.53E−04	5.02E−04	3.06E−04	2.27E−04	1.95E−04
165.00	2.15E−03	8.77E−04	7.40E−04	4.96E−04	3.06E−04	2.29E−04	1.98E−04
180.00	2.13E−03	8.72E−04	7.36E−04	4.94E−04	3.06E−04	2.30E−04	1.99E−04
total	2.14E+00	1.40E+00	1.29E+00	1.05E+00	7.94E−01	6.48E−01	5.77E−01
rel ff	2.27E+00	1.50E+00	1.39E+00	1.14E+00	8.68E−01	7.16E−01	6.33E−01
nrl ff	2.71E+00	1.80E+00	1.66E+00	1.36E+00	1.04E+00	8.58E−01	7.59E−01

TABLE 1. Predicted *S*-matrix differential elastic scattering cross sections for photon energies (50.0, 59.54, 145.4, 316.5, 411.8, 468.1, 661.6, 778.9, 964.0, 1004.8, 1112.1, 1274.5, 1408.0 and 1500.0). The angle integrated total cross sections for each element and energies are presented. ''total'' represents total cross sections from this work, ''rel ff'' represents total cross sections calculated from the relativistic form factor and ''nrl ff'' represents total cross sections calculated from the nonrelativistic form factor—Continued[a]

θ (deg)	Photon energy (keV)						
	50.0	59.5	145.4	316.5	411.8	468.1	661.6
Berkelium ($Z=97$)							
0.00	7.28E+02	7.25E+02	7.14E+02	7.28E+02	7.26E+02	7.26E+02	7.25E+02
0.01	7.28E+02	7.25E+02	7.14E+02	7.27E+02	7.26E+02	7.26E+02	7.24E+02
0.02	7.28E+02	7.25E+02	7.14E+02	7.27E+02	7.26E+02	7.25E+02	7.23E+02
0.04	7.28E+02	7.25E+02	7.14E+02	7.26E+02	7.25E+02	7.24E+02	7.20E+02
0.06	7.28E+02	7.25E+02	7.14E+02	7.25E+02	7.22E+02	7.21E+02	7.15E+02
0.10	7.28E+02	7.25E+02	7.13E+02	7.21E+02	7.15E+02	7.12E+02	6.99E+02
0.20	7.27E+02	7.24E+02	7.09E+02	7.04E+02	6.88E+02	6.79E+02	6.45E+02
0.30	7.27E+02	7.23E+02	7.02E+02	6.79E+02	6.53E+02	6.38E+02	5.86E+02
0.40	7.26E+02	7.22E+02	6.94E+02	6.52E+02	6.17E+02	5.97E+02	5.30E+02
0.50	7.25E+02	7.20E+02	6.84E+02	6.24E+02	5.81E+02	5.56E+02	4.75E+02
0.60	7.23E+02	7.17E+02	6.72E+02	5.96E+02	5.46E+02	5.17E+02	4.26E+02
0.70	7.21E+02	7.14E+02	6.61E+02	5.68E+02	5.11E+02	4.79E+02	3.82E+02
0.80	7.19E+02	7.11E+02	6.48E+02	5.41E+02	4.77E+02	4.43E+02	3.43E+02
1.00	7.14E+02	7.04E+02	6.23E+02	4.89E+02	4.17E+02	3.80E+02	2.80E+02
1.20	7.08E+02	6.96E+02	5.97E+02	4.40E+02	3.64E+02	3.27E+02	2.31E+02
1.50	6.97E+02	6.81E+02	5.59E+02	3.77E+02	3.00E+02	2.64E+02	1.77E+02
1.70	6.89E+02	6.71E+02	5.35E+02	3.40E+02	2.65E+02	2.31E+02	1.49E+02
2.00	6.76E+02	6.56E+02	4.98E+02	2.93E+02	2.22E+02	1.91E+02	1.18E+02
2.50	6.56E+02	6.30E+02	4.41E+02	2.33E+02	1.69E+02	1.42E+02	8.26E+01
3.00	6.36E+02	6.03E+02	3.90E+02	1.88E+02	1.31E+02	1.08E+02	5.89E+01
3.50	6.14E+02	5.77E+02	3.46E+02	1.53E+02	1.04E+02	8.36E+01	4.22E+01
4.00	5.93E+02	5.51E+02	3.08E+02	1.27E+02	8.35E+01	6.56E+01	3.08E+01
5.00	5.48E+02	5.00E+02	2.46E+02	8.89E+01	5.48E+01	4.16E+01	1.84E+01
6.00	5.04E+02	4.53E+02	2.00E+02	6.39E+01	3.65E+01	2.75E+01	1.29E+01
7.00	4.62E+02	4.09E+02	1.64E+02	4.67E+01	2.52E+01	1.92E+01	9.68E+00
8.00	4.23E+02	3.70E+02	1.36E+02	3.49E+01	1.86E+01	1.42E+01	7.19E+00
9.00	3.86E+02	3.36E+02	1.14E+02	2.66E+01	1.47E+01	1.11E+01	5.20E+00
10.00	3.53E+02	3.05E+02	9.66E+01	2.09E+01	1.21E+01	8.99E+00	3.73E+00
12.50	2.88E+02	2.43E+02	6.51E+01	1.27E+01	7.70E+00	5.49E+00	1.88E+00
15.00	2.40E+02	1.95E+02	4.43E+01	8.69E+00	4.65E+00	3.28E+00	1.23E+00
17.50	2.03E+02	1.59E+02	3.05E+01	6.12E+00	2.83E+00	2.01E+00	8.88E−01
20.00	1.72E+02	1.31E+02	2.17E+01	4.32E+00	1.89E+00	1.35E+00	6.33E−01
22.50	1.45E+02	1.08E+02	1.63E+01	3.07E+00	1.40E+00	1.00E+00	4.34E−01
25.00	1.21E+02	9.06E+01	1.28E+01	2.22E+00	1.11E+00	7.86E−01	2.92E−01
27.50	1.02E+02	7.62E+01	1.05E+01	1.66E+00	9.04E−01	6.27E−01	1.98E−01
30.00	8.55E+01	6.42E+01	8.74E+00	1.29E+00	7.32E−01	4.97E−01	1.38E−01
35.00	6.11E+01	4.58E+01	6.09E+00	8.61E−01	4.62E−01	3.01E−01	7.55E−02
40.00	4.45E+01	3.27E+01	4.12E+00	6.09E−01	2.80E−01	1.78E−01	4.80E−02
45.00	3.30E+01	2.36E+01	2.75E+00	4.35E−01	1.71E−01	1.09E−01	3.37E−02
50.00	2.50E+01	1.75E+01	1.87E+00	3.09E−01	1.10E−01	7.04E−02	2.49E−02
55.00	1.94E+01	1.34E+01	1.33E+00	2.21E−01	7.57E−02	4.90E−02	1.90E−02
60.00	1.55E+01	1.06E+01	1.01E+00	1.60E−01	5.58E−02	3.67E−02	1.49E−02
65.00	1.26E+01	8.67E+00	8.03E−01	1.19E−01	4.38E−02	2.92E−02	1.19E−02
70.00	1.06E+01	7.29E+00	6.70E−01	9.20E−02	3.62E−02	2.45E−02	9.81E−03
75.00	9.00E+00	6.26E+00	5.78E−01	7.43E−02	3.14E−02	2.14E−02	8.34E−03
80.00	7.82E+00	5.49E+00	5.14E−01	6.26E−02	2.82E−02	1.94E−02	7.30E−03
85.00	6.93E+00	4.90E+00	4.67E−01	5.51E−02	2.62E−02	1.81E−02	6.58E−03
90.00	6.26E+00	4.45E+00	4.32E−01	5.03E−02	2.49E−02	1.72E−02	6.08E−03
95.00	5.76E+00	4.11E+00	4.08E−01	4.73E−02	2.41E−02	1.67E−02	5.73E−03
105.00	5.11E+00	3.68E+00	3.78E−01	4.47E−02	2.34E−02	1.62E−02	5.28E−03
120.00	4.69E+00	3.39E+00	3.64E−01	4.50E−02	2.36E−02	1.61E−02	4.92E−03
135.00	4.58E+00	3.32E+00	3.65E−01	4.68E−02	2.41E−02	1.62E−02	4.71E−03
150.00	4.60E+00	3.33E+00	3.71E−01	4.87E−02	2.45E−02	1.63E−02	4.57E−03
165.00	4.63E+00	3.36E+00	3.76E−01	4.99E−02	2.47E−02	1.63E−02	4.49E−03
180.00	4.65E+00	3.37E+00	3.78E−01	5.03E−02	2.48E−02	1.63E−02	4.46E−03
total	3.12E+02	2.41E+02	5.01E+01	1.29E+01	7.77E+00	6.03E+00	3.05E+00
rel ff	3.24E+02	2.45E+02	5.33E+01	1.29E+01	7.89E+00	6.20E+00	3.20E+00
nrl ff	3.48E+02	2.66E+02	6.09E+01	1.51E+01	9.32E+00	7.35E+00	3.82E+00

TABLE 1. Predicted *S*-matrix differential elastic scattering cross sections for photon energies (50.0, 59.54, 145.4, 316.5, 411.8, 468.1, 661.6, 778.9, 964.0, 1004.8, 1112.1, 1274.5, 1408.0 and 1500.0). The angle integrated total cross sections for each element and energies are presented. ''total'' represents total cross sections from this work, ''rel ff'' represents total cross sections calculated from the relativistic form factor and ''nrl ff'' represents total cross sections calculated from the nonrelativistic form factor—Continued[a]

θ (deg)	Photon energy (keV)						
	778.9	964.0	1004.8	1112.1	1274.5	1408.0	1500.0
Berkelium ($Z=97$)							
0.00	7.25E+02	7.24E+02	7.24E+02	7.24E+02	7.23E+02	7.23E+02	7.22E+02
0.01	7.24E+02	7.23E+02	7.23E+02	7.23E+02	7.22E+02	7.21E+02	7.20E+02
0.02	7.23E+02	7.22E+02	7.22E+02	7.21E+02	7.19E+02	7.17E+02	7.15E+02
0.04	7.18E+02	7.15E+02	7.14E+02	7.11E+02	7.07E+02	7.03E+02	7.00E+02
0.06	7.11E+02	7.04E+02	7.02E+02	6.97E+02	6.90E+02	6.84E+02	6.79E+02
0.10	6.90E+02	6.75E+02	6.71E+02	6.62E+02	6.47E+02	6.35E+02	6.28E+02
0.20	6.24E+02	5.90E+02	5.83E+02	5.64E+02	5.36E+02	5.14E+02	4.99E+02
0.30	5.55E+02	5.08E+02	4.98E+02	4.72E+02	4.35E+02	4.06E+02	3.87E+02
0.40	4.91E+02	4.33E+02	4.22E+02	3.92E+02	3.52E+02	3.24E+02	3.06E+02
0.50	4.31E+02	3.69E+02	3.57E+02	3.27E+02	2.89E+02	2.62E+02	2.47E+02
0.60	3.79E+02	3.17E+02	3.04E+02	2.76E+02	2.39E+02	2.15E+02	2.01E+02
0.70	3.34E+02	2.73E+02	2.62E+02	2.34E+02	2.00E+02	1.77E+02	1.64E+02
0.80	2.96E+02	2.38E+02	2.27E+02	2.01E+02	1.69E+02	1.48E+02	1.35E+02
1.00	2.36E+02	1.83E+02	1.73E+02	1.51E+02	1.24E+02	1.07E+02	9.63E+01
1.20	1.90E+02	1.43E+02	1.35E+02	1.16E+02	9.34E+01	7.91E+01	7.10E+01
1.50	1.41E+02	1.02E+02	9.58E+01	8.06E+01	6.27E+01	5.13E+01	4.47E+01
1.70	1.18E+02	8.35E+01	7.77E+01	6.44E+01	4.86E+01	3.84E+01	3.24E+01
2.00	9.12E+01	6.23E+01	5.75E+01	4.65E+01	3.37E+01	2.55E+01	2.08E+01
2.50	6.07E+01	3.86E+01	3.52E+01	2.77E+01	1.99E+01	1.56E+01	1.33E+01
3.00	4.12E+01	2.47E+01	2.23E+01	1.76E+01	1.34E+01	1.18E+01	1.14E+01
3.50	2.89E+01	1.72E+01	1.56E+01	1.25E+01	9.86E+00	9.06E+00	9.11E+00
4.00	2.13E+01	1.32E+01	1.21E+01	9.77E+00	7.51E+00	6.30E+00	5.67E+00
5.00	1.33E+01	8.97E+00	8.28E+00	6.62E+00	4.33E+00	2.63E+00	1.68E+00
6.00	9.20E+00	5.87E+00	5.33E+00	4.08E+00	2.49E+00	1.45E+00	9.01E−01
7.00	6.45E+00	3.58E+00	3.18E+00	2.35E+00	1.56E+00	1.15E+00	9.58E−01
8.00	4.48E+00	2.25E+00	1.97E+00	1.45E+00	1.08E+00	1.03E+00	1.14E+00
9.00	3.16E+00	1.57E+00	1.37E+00	1.03E+00	8.13E−01	8.42E−01	9.96E−01
10.00	2.31E+00	1.23E+00	1.09E+00	8.37E−01	6.42E−01	5.90E−01	6.01E−01
12.50	1.28E+00	8.25E−01	7.55E−01	5.90E−01	3.55E−01	1.89E−01	1.04E−01
15.00	8.35E−01	5.14E−01	4.62E−01	3.39E−01	1.79E−01	8.22E−02	4.01E−02
17.50	5.59E−01	2.85E−01	2.47E−01	1.69E−01	9.27E−02	5.41E−02	3.60E−02
20.00	3.65E−01	1.58E−01	1.33E−01	8.84E−02	5.46E−02	4.35E−02	4.14E−02
22.50	2.36E−01	9.57E−02	8.02E−02	5.36E−02	3.67E−02	3.53E−02	4.11E−02
25.00	1.56E−01	6.46E−02	5.47E−02	3.78E−02	2.71E−02	2.68E−02	3.13E−02
27.50	1.07E−01	4.80E−02	4.14E−02	2.97E−02	2.12E−02	1.89E−02	1.92E−02
30.00	7.72E−02	3.80E−02	3.34E−02	2.47E−02	1.69E−02	1.28E−02	1.06E−02
35.00	4.53E−02	2.58E−02	2.32E−02	1.76E−02	1.05E−02	5.70E−03	3.21E−03
40.00	2.99E−02	1.77E−02	1.59E−02	1.18E−02	6.24E−03	2.79E−03	1.29E−03
45.00	2.11E−02	1.19E−02	1.05E−02	7.43E−03	3.65E−03	1.55E−03	6.98E−04
50.00	1.53E−02	7.94E−03	6.88E−03	4.60E−03	2.16E−03	9.41E−04	4.54E−04
55.00	1.14E−02	5.40E−03	4.59E−03	2.94E−03	1.38E−03	6.44E−04	3.47E−04
60.00	8.62E−03	3.82E−03	3.20E−03	2.01E−03	9.61E−04	4.97E−04	3.04E−04
65.00	6.72E−03	2.83E−03	2.36E−03	1.46E−03	7.27E−04	4.14E−04	2.82E−04
70.00	5.43E−03	2.23E−03	1.85E−03	1.15E−03	5.95E−04	3.68E−04	2.75E−04
75.00	4.56E−03	1.85E−03	1.54E−03	9.64E−04	5.18E−04	3.40E−04	2.69E−04
80.00	3.96E−03	1.60E−03	1.33E−03	8.45E−04	4.67E−04	3.20E−04	2.63E−04
85.00	3.55E−03	1.44E−03	1.20E−03	7.69E−04	4.34E−04	3.04E−04	2.54E−04
90.00	3.27E−03	1.34E−03	1.11E−03	7.17E−04	4.11E−04	2.91E−04	2.46E−04
95.00	3.07E−03	1.26E−03	1.05E−03	6.80E−04	3.93E−04	2.81E−04	2.38E−04
105.00	2.81E−03	1.15E−03	9.64E−04	6.29E−04	3.68E−04	2.65E−04	2.25E−04
120.00	2.58E−03	1.05E−03	8.85E−04	5.81E−04	3.45E−04	2.51E−04	2.15E−04
135.00	2.44E−03	1.00E−03	8.42E−04	5.57E−04	3.35E−04	2.46E−04	2.10E−04
150.00	2.35E−03	9.65E−04	8.14E−04	5.42E−04	3.30E−04	2.44E−04	2.09E−04
165.00	2.30E−03	9.47E−04	7.99E−04	5.36E−04	3.29E−04	2.45E−04	2.11E−04
180.00	2.28E−03	9.41E−04	7.95E−04	5.34E−04	3.30E−04	2.46E−04	2.12E−04
total	2.20E+00	1.44E+00	1.33E+00	1.08E+00	8.17E−01	6.66E−01	5.94E−01
rel ff	2.34E+00	1.55E+00	1.43E+00	1.17E+00	8.93E−01	7.37E−01	6.52E−01
nrl ff	2.80E+00	1.85E+00	1.71E+00	1.40E+00	1.07E+00	8.86E−01	7.85E−01

TABLE 1. Predicted *S*-matrix differential elastic scattering cross sections for photon energies (50.0, 59.54, 145.4, 316.5, 411.8, 468.1, 661.6, 778.9, 964.0, 1004.8, 1112.1, 1274.5, 1408.0 and 1500.0). The angle integrated total cross sections for each element and energies are presented. ''total'' represents total cross sections from this work, ''rel ff'' represents total cross sections calculated from the relativistic form factor and ''nrl ff'' represents total cross sections calculated from the nonrelativistic form factor—Continued[a]

θ (deg)	Photon energy (keV)						
	50.0	59.5	145.4	316.5	411.8	468.1	661.6
Californium ($Z=98$)							
0.00	7.44E+02	7.40E+02	7.27E+02	7.42E+02	7.41E+02	7.41E+02	7.40E+02
0.01	7.44E+02	7.40E+02	7.27E+02	7.42E+02	7.41E+02	7.40E+02	7.39E+02
0.02	7.44E+02	7.40E+02	7.27E+02	7.42E+02	7.40E+02	7.40E+02	7.38E+02
0.04	7.44E+02	7.40E+02	7.27E+02	7.41E+02	7.39E+02	7.38E+02	7.35E+02
0.06	7.44E+02	7.40E+02	7.26E+02	7.40E+02	7.37E+02	7.36E+02	7.30E+02
0.10	7.43E+02	7.40E+02	7.26E+02	7.36E+02	7.30E+02	7.27E+02	7.14E+02
0.20	7.43E+02	7.39E+02	7.22E+02	7.18E+02	7.03E+02	6.94E+02	6.59E+02
0.30	7.42E+02	7.38E+02	7.15E+02	6.94E+02	6.68E+02	6.53E+02	6.00E+02
0.40	7.41E+02	7.37E+02	7.07E+02	6.67E+02	6.32E+02	6.11E+02	5.43E+02
0.50	7.40E+02	7.35E+02	6.97E+02	6.38E+02	5.95E+02	5.70E+02	4.87E+02
0.60	7.38E+02	7.32E+02	6.85E+02	6.10E+02	5.59E+02	5.30E+02	4.37E+02
0.70	7.37E+02	7.29E+02	6.74E+02	5.82E+02	5.24E+02	4.91E+02	3.91E+02
0.80	7.35E+02	7.26E+02	6.61E+02	5.54E+02	4.89E+02	4.54E+02	3.51E+02
1.00	7.30E+02	7.19E+02	6.35E+02	5.01E+02	4.27E+02	3.89E+02	2.86E+02
1.20	7.24E+02	7.11E+02	6.10E+02	4.51E+02	3.73E+02	3.35E+02	2.36E+02
1.50	7.12E+02	6.96E+02	5.71E+02	3.86E+02	3.07E+02	2.70E+02	1.80E+02
1.70	7.04E+02	6.86E+02	5.46E+02	3.48E+02	2.71E+02	2.36E+02	1.52E+02
2.00	6.92E+02	6.71E+02	5.09E+02	3.00E+02	2.27E+02	1.94E+02	1.21E+02
2.50	6.71E+02	6.44E+02	4.51E+02	2.38E+02	1.72E+02	1.45E+02	8.48E+01
3.00	6.51E+02	6.18E+02	3.99E+02	1.91E+02	1.34E+02	1.10E+02	6.07E+01
3.50	6.30E+02	5.91E+02	3.53E+02	1.56E+02	1.06E+02	8.58E+01	4.37E+01
4.00	6.08E+02	5.65E+02	3.14E+02	1.29E+02	8.57E+01	6.75E+01	3.19E+01
5.00	5.63E+02	5.13E+02	2.51E+02	9.12E+01	5.66E+01	4.30E+01	1.89E+01
6.00	5.19E+02	4.64E+02	2.03E+02	6.58E+01	3.77E+01	2.85E+01	1.32E+01
7.00	4.76E+02	4.20E+02	1.67E+02	4.82E+01	2.61E+01	1.98E+01	9.88E+00
8.00	4.34E+02	3.79E+02	1.38E+02	3.60E+01	1.92E+01	1.46E+01	7.39E+00
9.00	3.97E+02	3.44E+02	1.16E+02	2.75E+01	1.50E+01	1.14E+01	5.38E+00
10.00	3.62E+02	3.12E+02	9.83E+01	2.15E+01	1.23E+01	9.18E+00	3.89E+00
12.50	2.94E+02	2.48E+02	6.65E+01	1.31E+01	7.90E+00	5.64E+00	1.94E+00
15.00	2.45E+02	1.99E+02	4.54E+01	8.88E+00	4.82E+00	3.40E+00	1.25E+00
17.50	2.07E+02	1.62E+02	3.13E+01	6.28E+00	2.94E+00	2.09E+00	9.09E−01
20.00	1.76E+02	1.33E+02	2.22E+01	4.46E+00	1.95E+00	1.40E+00	6.53E−01
22.50	1.49E+02	1.11E+02	1.65E+01	3.17E+00	1.44E+00	1.03E+00	4.52E−01
25.00	1.25E+02	9.29E+01	1.29E+01	2.30E+00	1.14E+00	8.04E−01	3.06E−01
27.50	1.05E+02	7.83E+01	1.05E+01	1.72E+00	9.23E−01	6.42E−01	2.08E−01
30.00	8.86E+01	6.61E+01	8.75E+00	1.33E+00	7.51E−01	5.12E−01	1.45E−01
35.00	6.36E+01	4.73E+01	6.11E+00	8.83E−01	4.79E−01	3.13E−01	7.86E−02
40.00	4.64E+01	3.39E+01	4.16E+00	6.25E−01	2.93E−01	1.87E−01	4.95E−02
45.00	3.45E+01	2.45E+01	2.78E+00	4.48E−01	1.80E−01	1.14E−01	3.45E−02
50.00	2.61E+01	1.81E+01	1.89E+00	3.21E−01	1.16E−01	7.37E−02	2.55E−02
55.00	2.03E+01	1.38E+01	1.34E+00	2.30E−01	7.91E−02	5.11E−02	1.95E−02
60.00	1.61E+01	1.09E+01	1.00E+00	1.67E−01	5.80E−02	3.80E−02	1.53E−02
65.00	1.31E+01	8.91E+00	7.91E−01	1.25E−01	4.53E−02	3.01E−02	1.23E−02
70.00	1.10E+01	7.47E+00	6.56E−01	9.65E−02	3.73E−02	2.52E−02	1.01E−02
75.00	9.35E+00	6.41E+00	5.65E−01	7.78E−02	3.23E−02	2.20E−02	8.66E−03
80.00	8.13E+00	5.62E+00	5.01E−01	6.55E−02	2.90E−02	1.99E−02	7.61E−03
85.00	7.22E+00	5.03E+00	4.56E−01	5.75E−02	2.69E−02	1.86E−02	6.88E−03
90.00	6.53E+00	4.58E+00	4.23E−01	5.24E−02	2.55E−02	1.77E−02	6.37E−03
95.00	6.02E+00	4.24E+00	4.00E−01	4.92E−02	2.47E−02	1.72E−02	6.01E−03
105.00	5.37E+00	3.81E+00	3.71E−01	4.64E−02	2.41E−02	1.67E−02	5.57E−03
120.00	4.96E+00	3.54E+00	3.57E−01	4.66E−02	2.43E−02	1.67E−02	5.21E−03
135.00	4.88E+00	3.48E+00	3.58E−01	4.85E−02	2.49E−02	1.68E−02	5.00E−03
150.00	4.91E+00	3.50E+00	3.62E−01	5.04E−02	2.54E−02	1.70E−02	4.86E−03
165.00	4.96E+00	3.53E+00	3.65E−01	5.17E−02	2.56E−02	1.70E−02	4.77E−03
180.00	4.98E+00	3.54E+00	3.67E−01	5.21E−02	2.57E−02	1.70E−02	4.74E−03
total	3.23E+02	2.48E+02	5.07E+01	1.33E+01	7.98E+00	6.20E+00	3.14E+00
rel ff	3.32E+02	2.52E+02	5.48E+01	1.32E+01	8.11E+00	6.37E+00	3.29E+00
nrl ff	3.57E+02	2.73E+02	6.26E+01	1.55E+01	9.61E+00	7.57E+00	3.94E+00

TABLE 1. Predicted *S*-matrix differential elastic scattering cross sections for photon energies (50.0, 59.54, 145.4, 316.5, 411.8, 468.1, 661.6, 778.9, 964.0, 1004.8, 1112.1, 1274.5, 1408.0 and 1500.0). The angle integrated total cross sections for each element and energies are presented. ''total'' represents total cross sections from this work, ''rel ff'' represents total cross sections calculated from the relativistic form factor and ''nrl ff'' represents total cross sections calculated from the nonrelativistic form factor—Continued[a]

θ (deg)	Photon energy (keV)						
	778.9	964.0	1004.8	1112.1	1274.5	1408.0	1500.0
Californium ($Z=98$)							
0.00	7.39E+02	7.39E+02	7.39E+02	7.39E+02	7.38E+02	7.37E+02	7.37E+02
0.01	7.38E+02	7.38E+02	7.38E+02	7.37E+02	7.36E+02	7.36E+02	7.35E+02
0.02	7.37E+02	7.36E+02	7.36E+02	7.35E+02	7.34E+02	7.32E+02	7.30E+02
0.04	7.33E+02	7.29E+02	7.28E+02	7.26E+02	7.22E+02	7.18E+02	7.15E+02
0.06	7.26E+02	7.18E+02	7.17E+02	7.12E+02	7.05E+02	6.98E+02	6.94E+02
0.10	7.05E+02	6.89E+02	6.86E+02	6.76E+02	6.62E+02	6.50E+02	6.42E+02
0.20	6.38E+02	6.04E+02	5.97E+02	5.78E+02	5.49E+02	5.27E+02	5.12E+02
0.30	5.69E+02	5.21E+02	5.11E+02	4.84E+02	4.46E+02	4.16E+02	3.97E+02
0.40	5.03E+02	4.44E+02	4.32E+02	4.02E+02	3.61E+02	3.31E+02	3.13E+02
0.50	4.42E+02	3.78E+02	3.66E+02	3.35E+02	2.95E+02	2.68E+02	2.52E+02
0.60	3.89E+02	3.24E+02	3.12E+02	2.82E+02	2.44E+02	2.19E+02	2.05E+02
0.70	3.42E+02	2.79E+02	2.67E+02	2.39E+02	2.04E+02	1.81E+02	1.68E+02
0.80	3.03E+02	2.43E+02	2.32E+02	2.05E+02	1.73E+02	1.51E+02	1.39E+02
1.00	2.41E+02	1.86E+02	1.77E+02	1.54E+02	1.27E+02	1.09E+02	9.89E+01
1.20	1.94E+02	1.46E+02	1.38E+02	1.18E+02	9.57E+01	8.13E+01	7.30E+01
1.50	1.44E+02	1.05E+02	9.82E+01	8.28E+01	6.46E+01	5.30E+01	4.62E+01
1.70	1.20E+02	8.57E+01	7.98E+01	6.63E+01	5.02E+01	3.97E+01	3.35E+01
2.00	9.35E+01	6.42E+01	5.93E+01	4.81E+01	3.49E+01	2.64E+01	2.15E+01
2.50	6.25E+01	4.00E+01	3.64E+01	2.87E+01	2.06E+01	1.59E+01	1.34E+01
3.00	4.26E+01	2.56E+01	2.31E+01	1.82E+01	1.37E+01	1.19E+01	1.15E+01
3.50	2.98E+01	1.77E+01	1.60E+01	1.28E+01	1.01E+01	9.27E+00	9.36E+00
4.00	2.19E+01	1.35E+01	1.23E+01	9.93E+00	7.67E+00	6.56E+00	6.04E+00
5.00	1.36E+01	9.14E+00	8.43E+00	6.76E+00	4.47E+00	2.78E+00	1.81E+00
6.00	9.42E+00	6.07E+00	5.52E+00	4.24E+00	2.59E+00	1.49E+00	9.13E−01
7.00	6.63E+00	3.74E+00	3.33E+00	2.47E+00	1.62E+00	1.16E+00	9.25E−01
8.00	4.64E+00	2.35E+00	2.06E+00	1.51E+00	1.11E+00	1.04E+00	1.11E+00
9.00	3.28E+00	1.62E+00	1.42E+00	1.06E+00	8.35E−01	8.63E−01	1.02E+00
10.00	2.40E+00	1.25E+00	1.11E+00	8.52E−01	6.58E−01	6.20E−01	6.51E−01
12.50	1.31E+00	8.41E−01	7.69E−01	6.01E−01	3.69E−01	2.03E−01	1.16E−01
15.00	8.57E−01	5.34E−01	4.82E−01	3.56E−01	1.88E−01	8.60E−02	4.15E−02
17.50	5.78E−01	3.01E−01	2.61E−01	1.80E−01	9.76E−02	5.51E−02	3.51E−02
20.00	3.80E−01	1.67E−01	1.41E−01	9.38E−02	5.70E−02	4.37E−02	4.01E−02
22.50	2.48E−01	1.01E−01	8.43E−02	5.61E−02	3.79E−02	3.57E−02	4.08E−02
25.00	1.64E−01	6.72E−02	5.68E−02	3.89E−02	2.77E−02	2.74E−02	3.23E−02
27.50	1.12E−01	4.94E−02	4.25E−02	3.02E−02	2.16E−02	1.96E−02	2.05E−02
30.00	8.05E−02	3.89E−02	3.40E−02	2.50E−02	1.72E−02	1.35E−02	1.16E−02
35.00	4.68E−02	2.63E−02	2.36E−02	1.78E−02	1.08E−02	6.06E−03	3.54E−03
40.00	3.07E−02	1.81E−02	1.63E−02	1.21E−02	6.52E−03	2.97E−03	1.40E−03
45.00	2.16E−02	1.23E−02	1.09E−02	7.77E−03	3.87E−03	1.65E−03	7.45E−04
50.00	1.57E−02	8.28E−03	7.21E−03	4.87E−03	2.32E−03	1.01E−03	4.81E−04
55.00	1.17E−02	5.67E−03	4.84E−03	3.14E−03	1.48E−03	6.90E−04	3.67E−04
60.00	8.92E−03	4.04E−03	3.40E−03	2.16E−03	1.04E−03	5.34E−04	3.21E−04
65.00	6.99E−03	3.01E−03	2.51E−03	1.58E−03	7.88E−04	4.45E−04	2.99E−04
70.00	5.67E−03	2.37E−03	1.98E−03	1.24E−03	6.45E−04	3.96E−04	2.92E−04
75.00	4.78E−03	1.98E−03	1.65E−03	1.04E−03	5.62E−04	3.66E−04	2.87E−04
80.00	4.17E−03	1.72E−03	1.43E−03	9.14E−04	5.07E−04	3.44E−04	2.80E−04
85.00	3.75E−03	1.55E−03	1.29E−03	8.32E−04	4.71E−04	3.27E−04	2.72E−04
90.00	3.46E−03	1.43E−03	1.20E−03	7.76E−04	4.45E−04	3.14E−04	2.64E−04
95.00	3.26E−03	1.35E−03	1.13E−03	7.36E−04	4.26E−04	3.03E−04	2.55E−04
105.00	2.99E−03	1.24E−03	1.04E−03	6.81E−04	3.99E−04	2.86E−04	2.42E−04
120.00	2.75E−03	1.14E−03	9.55E−04	6.29E−04	3.74E−04	2.71E−04	2.30E−04
135.00	2.61E−03	1.08E−03	9.09E−04	6.03E−04	3.62E−04	2.64E−04	2.24E−04
150.00	2.52E−03	1.04E−03	8.79E−04	5.86E−04	3.56E−04	2.62E−04	2.23E−04
165.00	2.47E−03	1.02E−03	8.63E−04	5.79E−04	3.55E−04	2.63E−04	2.26E−04
180.00	2.45E−03	1.02E−03	8.58E−04	5.77E−04	3.56E−04	2.64E−04	2.27E−04
total	2.26E+00	1.48E+00	1.36E+00	1.11E+00	8.41E−01	6.85E−01	6.11E−01
rel ff	2.41E+00	1.59E+00	1.47E+00	1.20E+00	9.20E−01	7.58E−01	6.71E−01
nrl ff	2.89E+00	1.91E+00	1.77E+00	1.45E+00	1.11E+00	9.16E−01	8.11E−01

TABLE 1. Predicted *S*-matrix differential elastic scattering cross sections for photon energies (50.0, 59.54, 145.4, 316.5, 411.8, 468.1, 661.6, 778.9, 964.0, 1004.8, 1112.1, 1274.5, 1408.0 and 1500.0). The angle integrated total cross sections for each element and energies are presented. ''total'' represents total cross sections from this work, ''rel ff'' represents total cross sections calculated from the relativistic form factor and ''nrl ff'' represents total cross sections calculated from the nonrelativistic form factor—Continued[a]

θ (deg)	Photon energy (keV)						
	50.0	59.5	145.4	316.5	411.8	468.1	661.6
Einsteinium ($Z=99$)							
0.00	7.59E+02	7.55E+02	7.40E+02	7.57E+02	7.56E+02	7.55E+02	7.54E+02
0.01	7.59E+02	7.55E+02	7.40E+02	7.57E+02	7.55E+02	7.55E+02	7.54E+02
0.02	7.59E+02	7.55E+02	7.40E+02	7.57E+02	7.55E+02	7.54E+02	7.53E+02
0.04	7.59E+02	7.55E+02	7.39E+02	7.56E+02	7.54E+02	7.53E+02	7.50E+02
0.06	7.59E+02	7.55E+02	7.39E+02	7.55E+02	7.52E+02	7.50E+02	7.45E+02
0.10	7.59E+02	7.55E+02	7.39E+02	7.51E+02	7.45E+02	7.42E+02	7.29E+02
0.20	7.58E+02	7.54E+02	7.35E+02	7.33E+02	7.18E+02	7.09E+02	6.74E+02
0.30	7.58E+02	7.53E+02	7.28E+02	7.09E+02	6.83E+02	6.68E+02	6.15E+02
0.40	7.57E+02	7.52E+02	7.19E+02	6.82E+02	6.46E+02	6.26E+02	5.56E+02
0.50	7.56E+02	7.50E+02	7.10E+02	6.53E+02	6.09E+02	5.84E+02	5.00E+02
0.60	7.54E+02	7.47E+02	6.98E+02	6.25E+02	5.73E+02	5.43E+02	4.48E+02
0.70	7.52E+02	7.44E+02	6.87E+02	5.96E+02	5.37E+02	5.03E+02	4.01E+02
0.80	7.50E+02	7.41E+02	6.74E+02	5.68E+02	5.02E+02	4.66E+02	3.60E+02
1.00	7.45E+02	7.34E+02	6.48E+02	5.14E+02	4.38E+02	3.99E+02	2.92E+02
1.20	7.39E+02	7.26E+02	6.23E+02	4.63E+02	3.82E+02	3.43E+02	2.41E+02
1.50	7.28E+02	7.11E+02	5.84E+02	3.95E+02	3.13E+02	2.76E+02	1.84E+02
1.70	7.20E+02	7.01E+02	5.58E+02	3.57E+02	2.77E+02	2.41E+02	1.55E+02
2.00	7.08E+02	6.86E+02	5.20E+02	3.07E+02	2.31E+02	1.98E+02	1.23E+02
2.50	6.87E+02	6.59E+02	4.61E+02	2.43E+02	1.76E+02	1.48E+02	8.70E+01
3.00	6.67E+02	6.32E+02	4.07E+02	1.95E+02	1.37E+02	1.13E+02	6.26E+01
3.50	6.45E+02	6.05E+02	3.60E+02	1.60E+02	1.09E+02	8.80E+01	4.52E+01
4.00	6.24E+02	5.79E+02	3.20E+02	1.32E+02	8.79E+01	6.94E+01	3.30E+01
5.00	5.78E+02	5.26E+02	2.55E+02	9.34E+01	5.83E+01	4.44E+01	1.95E+01
6.00	5.33E+02	4.76E+02	2.06E+02	6.76E+01	3.91E+01	2.94E+01	1.34E+01
7.00	4.89E+02	4.31E+02	1.69E+02	4.98E+01	2.70E+01	2.04E+01	1.01E+01
8.00	4.47E+02	3.89E+02	1.40E+02	3.72E+01	1.97E+01	1.50E+01	7.59E+00
9.00	4.08E+02	3.52E+02	1.18E+02	2.84E+01	1.54E+01	1.16E+01	5.57E+00
10.00	3.72E+02	3.20E+02	1.00E+02	2.22E+01	1.26E+01	9.37E+00	4.04E+00
12.50	3.01E+02	2.53E+02	6.78E+01	1.34E+01	8.09E+00	5.79E+00	2.01E+00
15.00	2.50E+02	2.03E+02	4.65E+01	9.07E+00	5.00E+00	3.53E+00	1.28E+00
17.50	2.11E+02	1.66E+02	3.21E+01	6.44E+00	3.06E+00	2.17E+00	9.29E−01
20.00	1.80E+02	1.36E+02	2.27E+01	4.59E+00	2.02E+00	1.44E+00	6.73E−01
22.50	1.53E+02	1.13E+02	1.68E+01	3.28E+00	1.47E+00	1.05E+00	4.71E−01
25.00	1.29E+02	9.51E+01	1.30E+01	2.38E+00	1.16E+00	8.22E−01	3.21E−01
27.50	1.09E+02	8.03E+01	1.05E+01	1.78E+00	9.42E−01	6.58E−01	2.19E−01
30.00	9.19E+01	6.80E+01	8.74E+00	1.38E+00	7.70E−01	5.27E−01	1.52E−01
35.00	6.61E+01	4.89E+01	6.11E+00	9.06E−01	4.96E−01	3.26E−01	8.19E−02
40.00	4.84E+01	3.51E+01	4.18E+00	6.41E−01	3.07E−01	1.96E−01	5.11E−02
45.00	3.60E+01	2.55E+01	2.80E+00	4.62E−01	1.89E−01	1.20E−01	3.54E−02
50.00	2.73E+01	1.88E+01	1.90E+00	3.33E−01	1.21E−01	7.73E−02	2.61E−02
55.00	2.12E+01	1.43E+01	1.33E+00	2.40E−01	8.28E−02	5.32E−02	1.99E−02
60.00	1.68E+01	1.13E+01	9.90E−01	1.75E−01	6.03E−02	3.94E−02	1.57E−02
65.00	1.37E+01	9.15E+00	7.77E−01	1.31E−01	4.69E−02	3.11E−02	1.26E−02
70.00	1.14E+01	7.65E+00	6.41E−01	1.01E−01	3.85E−02	2.59E−02	1.05E−02
75.00	9.70E+00	6.56E+00	5.50E−01	8.16E−02	3.32E−02	2.26E−02	8.98E−03
80.00	8.45E+00	5.75E+00	4.88E−01	6.86E−02	2.98E−02	2.04E−02	7.92E−03
85.00	7.51E+00	5.15E+00	4.44E−01	6.01E−02	2.76E−02	1.90E−02	7.18E−03
90.00	6.80E+00	4.70E+00	4.12E−01	5.46E−02	2.62E−02	1.82E−02	6.67E−03
95.00	6.29E+00	4.37E+00	3.90E−01	5.12E−02	2.54E−02	1.76E−02	6.31E−03
105.00	5.64E+00	3.94E+00	3.63E−01	4.82E−02	2.48E−02	1.72E−02	5.86E−03
120.00	5.25E+00	3.69E+00	3.49E−01	4.83E−02	2.51E−02	1.72E−02	5.50E−03
135.00	5.19E+00	3.64E+00	3.48E−01	5.02E−02	2.57E−02	1.75E−02	5.29E−03
150.00	5.25E+00	3.67E+00	3.51E−01	5.22E−02	2.62E−02	1.76E−02	5.15E−03
165.00	5.31E+00	3.70E+00	3.53E−01	5.36E−02	2.66E−02	1.77E−02	5.07E−03
180.00	5.34E+00	3.72E+00	3.54E−01	5.40E−02	2.67E−02	1.77E−02	5.04E−03
total	3.34E+02	2.55E+02	5.13E+01	1.36E+01	8.20E+00	6.37E+00	3.23E+00
rel ff	3.41E+02	2.59E+02	5.62E+01	1.36E+01	8.33E+00	6.54E+00	3.38E+00
nrl ff	3.67E+02	2.81E+02	6.44E+01	1.60E+01	9.90E+00	7.81E+00	4.06E+00

TABLE 1. Predicted *S*-matrix differential elastic scattering cross sections for photon energies (50.0, 59.54, 145.4, 316.5, 411.8, 468.1, 661.6, 778.9, 964.0, 1004.8, 1112.1, 1274.5, 1408.0 and 1500.0). The angle integrated total cross sections for each element and energies are presented. ''total'' represents total cross sections from this work, ''rel ff'' represents total cross sections calculated from the relativistic form factor and ''nrl ff'' represents total cross sections calculated from the nonrelativistic form factor—Continued[a]

θ (deg)	Photon energy (keV)						
	778.9	964.0	1004.8	1112.1	1274.5	1408.0	1500.0
Einsteinium ($Z=99$)							
0.00	7.54E+02	7.54E+02	7.54E+02	7.53E+02	7.53E+02	7.52E+02	7.52E+02
0.01	7.53E+02	7.53E+02	7.52E+02	7.52E+02	7.51E+02	7.50E+02	7.49E+02
0.02	7.52E+02	7.51E+02	7.51E+02	7.50E+02	7.48E+02	7.47E+02	7.45E+02
0.04	7.48E+02	7.44E+02	7.43E+02	7.41E+02	7.37E+02	7.33E+02	7.30E+02
0.06	7.40E+02	7.33E+02	7.32E+02	7.27E+02	7.20E+02	7.13E+02	7.09E+02
0.10	7.20E+02	7.04E+02	7.01E+02	6.91E+02	6.77E+02	6.65E+02	6.57E+02
0.20	6.53E+02	6.19E+02	6.11E+02	5.92E+02	5.63E+02	5.40E+02	5.24E+02
0.30	5.83E+02	5.34E+02	5.24E+02	4.97E+02	4.57E+02	4.27E+02	4.07E+02
0.40	5.16E+02	4.56E+02	4.43E+02	4.12E+02	3.70E+02	3.39E+02	3.20E+02
0.50	4.53E+02	3.88E+02	3.75E+02	3.43E+02	3.02E+02	2.74E+02	2.57E+02
0.60	3.98E+02	3.32E+02	3.19E+02	2.88E+02	2.49E+02	2.24E+02	2.09E+02
0.70	3.51E+02	2.85E+02	2.73E+02	2.44E+02	2.08E+02	1.85E+02	1.71E+02
0.80	3.10E+02	2.48E+02	2.36E+02	2.09E+02	1.76E+02	1.54E+02	1.42E+02
1.00	2.46E+02	1.90E+02	1.80E+02	1.57E+02	1.29E+02	1.12E+02	1.02E+02
1.20	1.98E+02	1.49E+02	1.40E+02	1.21E+02	9.80E+01	8.34E+01	7.50E+01
1.50	1.47E+02	1.07E+02	1.01E+02	8.50E+01	6.66E+01	5.47E+01	4.77E+01
1.70	1.23E+02	8.80E+01	8.20E+01	6.83E+01	5.19E+01	4.11E+01	3.47E+01
2.00	9.58E+01	6.61E+01	6.11E+01	4.97E+01	3.61E+01	2.73E+01	2.22E+01
2.50	6.44E+01	4.14E+01	3.77E+01	2.98E+01	2.12E+01	1.62E+01	1.36E+01
3.00	4.40E+01	2.65E+01	2.40E+01	1.88E+01	1.41E+01	1.21E+01	1.14E+01
3.50	3.09E+01	1.82E+01	1.65E+01	1.31E+01	1.03E+01	9.46E+00	9.57E+00
4.00	2.26E+01	1.37E+01	1.25E+01	1.01E+01	7.84E+00	6.82E+00	6.42E+00
5.00	1.39E+01	9.30E+00	8.57E+00	6.88E+00	4.61E+00	2.94E+00	1.96E+00
6.00	9.63E+00	6.26E+00	5.71E+00	4.41E+00	2.69E+00	1.53E+00	9.29E−01
7.00	6.82E+00	3.91E+00	3.49E+00	2.60E+00	1.68E+00	1.16E+00	8.91E−01
8.00	4.79E+00	2.45E+00	2.15E+00	1.58E+00	1.15E+00	1.04E+00	1.08E+00
9.00	3.40E+00	1.68E+00	1.47E+00	1.10E+00	8.57E−01	8.81E−01	1.04E+00
10.00	2.48E+00	1.28E+00	1.14E+00	8.67E−01	6.74E−01	6.50E−01	7.02E−01
12.50	1.35E+00	8.56E−01	7.82E−01	6.12E−01	3.82E−01	2.18E−01	1.29E−01
15.00	8.79E−01	5.54E−01	5.01E−01	3.72E−01	1.98E−01	9.02E−02	4.31E−02
17.50	5.96E−01	3.17E−01	2.76E−01	1.91E−01	1.03E−01	5.61E−02	3.44E−02
20.00	3.96E−01	1.77E−01	1.50E−01	9.96E−02	5.95E−02	4.40E−02	3.86E−02
22.50	2.59E−01	1.06E−01	8.87E−02	5.89E−02	3.91E−02	3.61E−02	4.02E−02
25.00	1.72E−01	7.00E−02	5.90E−02	4.02E−02	2.84E−02	2.81E−02	3.31E−02
27.50	1.18E−01	5.09E−02	4.36E−02	3.08E−02	2.20E−02	2.04E−02	2.18E−02
30.00	8.40E−02	3.97E−02	3.47E−02	2.53E−02	1.76E−02	1.41E−02	1.26E−02
35.00	4.84E−02	2.67E−02	2.40E−02	1.81E−02	1.11E−02	6.44E−03	3.91E−03
40.00	3.15E−02	1.85E−02	1.67E−02	1.25E−02	6.80E−03	3.16E−03	1.52E−03
45.00	2.21E−02	1.27E−02	1.13E−02	8.11E−03	4.09E−03	1.76E−03	7.95E−04
50.00	1.61E−02	8.63E−03	7.54E−03	5.14E−03	2.48E−03	1.07E−03	5.10E−04
55.00	1.20E−02	5.95E−03	5.11E−03	3.35E−03	1.60E−03	7.39E−04	3.87E−04
60.00	9.22E−03	4.26E−03	3.61E−03	2.31E−03	1.12E−03	5.73E−04	3.39E−04
65.00	7.26E−03	3.19E−03	2.68E−03	1.70E−03	8.53E−04	4.78E−04	3.17E−04
70.00	5.92E−03	2.53E−03	2.11E−03	1.34E−03	7.00E−04	4.26E−04	3.09E−04
75.00	5.01E−03	2.11E−03	1.76E−03	1.12E−03	6.09E−04	3.94E−04	3.05E−04
80.00	4.39E−03	1.84E−03	1.54E−03	9.88E−04	5.50E−04	3.71E−04	2.98E−04
85.00	3.96E−03	1.66E−03	1.39E−03	8.99E−04	5.10E−04	3.53E−04	2.90E−04
90.00	3.66E−03	1.54E−03	1.29E−03	8.40E−04	4.83E−04	3.39E−04	2.82E−04
95.00	3.45E−03	1.45E−03	1.22E−03	7.96E−04	4.62E−04	3.26E−04	2.73E−04
105.00	3.17E−03	1.33E−03	1.12E−03	7.37E−04	4.32E−04	3.08E−04	2.59E−04
120.00	2.93E−03	1.22E−03	1.03E−03	6.81E−04	4.05E−04	2.92E−04	2.47E−04
135.00	2.79E−03	1.16E−03	9.81E−04	6.52E−04	3.92E−04	2.84E−04	2.41E−04
150.00	2.69E−03	1.12E−03	9.49E−04	6.34E−04	3.85E−04	2.82E−04	2.39E−04
165.00	2.64E−03	1.10E−03	9.32E−04	6.26E−04	3.83E−04	2.83E−04	2.41E−04
180.00	2.62E−03	1.10E−03	9.27E−04	6.24E−04	3.83E−04	2.84E−04	2.43E−04
total	2.33E+00	1.52E+00	1.40E+00	1.14E+00	8.65E−01	7.05E−01	6.28E−01
rel ff	2.47E+00	1.64E+00	1.51E+00	1.24E+00	9.47E−01	7.81E−01	6.91E−01
nrl ff	2.98E+00	1.98E+00	1.82E+00	1.50E+00	1.15E+00	9.45E−01	8.37E−01

TABLE 1. Predicted *S*-matrix differential elastic scattering cross sections for photon energies (50.0, 59.54, 145.4, 316.5, 411.8, 468.1, 661.6, 778.9, 964.0, 1004.8, 1112.1, 1274.5, 1408.0 and 1500.0). The angle integrated total cross sections for each element and energies are presented. ''total'' represents total cross sections from this work, ''rel ff'' represents total cross sections calculated from the relativistic form factor and ''nrl ff'' represents total cross sections calculated from the nonrelativistic form factor—Continued[a]

θ (deg)	Photon energy (keV)						
	50.0	59.5	145.4	316.5	411.8	468.1	661.6
Fernium ($Z=100$)							
0.00	7.75E+02	7.70E+02	7.53E+02	7.72E+02	7.71E+02	7.70E+02	7.69E+02
0.01	7.75E+02	7.70E+02	7.53E+02	7.72E+02	7.70E+02	7.70E+02	7.69E+02
0.02	7.75E+02	7.70E+02	7.52E+02	7.71E+02	7.70E+02	7.69E+02	7.68E+02
0.04	7.75E+02	7.70E+02	7.52E+02	7.71E+02	7.69E+02	7.68E+02	7.65E+02
0.06	7.75E+02	7.70E+02	7.52E+02	7.70E+02	7.67E+02	7.65E+02	7.60E+02
0.10	7.74E+02	7.70E+02	7.51E+02	7.66E+02	7.60E+02	7.57E+02	7.44E+02
0.20	7.74E+02	7.69E+02	7.47E+02	7.48E+02	7.33E+02	7.24E+02	6.90E+02
0.30	7.74E+02	7.68E+02	7.41E+02	7.24E+02	6.98E+02	6.83E+02	6.30E+02
0.40	7.73E+02	7.67E+02	7.32E+02	6.97E+02	6.62E+02	6.41E+02	5.70E+02
0.50	7.71E+02	7.65E+02	7.23E+02	6.68E+02	6.24E+02	5.99E+02	5.13E+02
0.60	7.70E+02	7.62E+02	7.11E+02	6.40E+02	5.87E+02	5.57E+02	4.60E+02
0.70	7.68E+02	7.60E+02	7.00E+02	6.11E+02	5.50E+02	5.16E+02	4.11E+02
0.80	7.66E+02	7.56E+02	6.87E+02	5.83E+02	5.15E+02	4.78E+02	3.69E+02
1.00	7.61E+02	7.49E+02	6.62E+02	5.27E+02	4.49E+02	4.09E+02	2.99E+02
1.20	7.55E+02	7.41E+02	6.36E+02	4.75E+02	3.91E+02	3.51E+02	2.46E+02
1.50	7.44E+02	7.27E+02	5.97E+02	4.05E+02	3.21E+02	2.82E+02	1.87E+02
1.70	7.36E+02	7.17E+02	5.71E+02	3.65E+02	2.82E+02	2.45E+02	1.59E+02
2.00	7.24E+02	7.01E+02	5.32E+02	3.14E+02	2.36E+02	2.02E+02	1.26E+02
2.50	7.03E+02	6.75E+02	4.71E+02	2.47E+02	1.79E+02	1.51E+02	8.92E+01
3.00	6.83E+02	6.48E+02	4.16E+02	1.99E+02	1.40E+02	1.15E+02	6.44E+01
3.50	6.62E+02	6.20E+02	3.68E+02	1.63E+02	1.11E+02	9.02E+01	4.68E+01
4.00	6.40E+02	5.93E+02	3.26E+02	1.35E+02	9.00E+01	7.13E+01	3.42E+01
5.00	5.95E+02	5.40E+02	2.59E+02	9.57E+01	6.01E+01	4.58E+01	2.00E+01
6.00	5.49E+02	4.89E+02	2.09E+02	6.95E+01	4.05E+01	3.04E+01	1.37E+01
7.00	5.04E+02	4.42E+02	1.71E+02	5.13E+01	2.79E+01	2.11E+01	1.03E+01
8.00	4.60E+02	3.99E+02	1.42E+02	3.84E+01	2.03E+01	1.54E+01	7.78E+00
9.00	4.19E+02	3.61E+02	1.20E+02	2.93E+01	1.57E+01	1.19E+01	5.77E+00
10.00	3.82E+02	3.27E+02	1.02E+02	2.29E+01	1.28E+01	9.55E+00	4.20E+00
12.50	3.07E+02	2.59E+02	6.92E+01	1.37E+01	8.28E+00	5.94E+00	2.08E+00
15.00	2.54E+02	2.08E+02	4.76E+01	9.26E+00	5.18E+00	3.66E+00	1.31E+00
17.50	2.15E+02	1.69E+02	3.29E+01	6.59E+00	3.18E+00	2.26E+00	9.49E−01
20.00	1.84E+02	1.39E+02	2.32E+01	4.72E+00	2.09E+00	1.49E+00	6.93E−01
22.50	1.56E+02	1.16E+02	1.70E+01	3.39E+00	1.51E+00	1.08E+00	4.89E−01
25.00	1.33E+02	9.74E+01	1.31E+01	2.47E+00	1.18E+00	8.40E−01	3.36E−01
27.50	1.12E+02	8.24E+01	1.06E+01	1.84E+00	9.61E−01	6.73E−01	2.30E−01
30.00	9.51E+01	6.99E+01	8.72E+00	1.42E+00	7.88E−01	5.41E−01	1.60E−01
35.00	6.88E+01	5.04E+01	6.10E+00	9.29E−01	5.14E−01	3.39E−01	8.55E−02
40.00	5.04E+01	3.64E+01	4.20E+00	6.57E−01	3.21E−01	2.05E−01	5.27E−02
45.00	3.76E+01	2.64E+01	2.82E+00	4.76E−01	1.99E−01	1.26E−01	3.62E−02
50.00	2.85E+01	1.95E+01	1.91E+00	3.45E−01	1.28E−01	8.10E−02	2.66E−02
55.00	2.21E+01	1.48E+01	1.33E+00	2.50E−01	8.66E−02	5.56E−02	2.04E−02
60.00	1.75E+01	1.16E+01	9.79E−01	1.83E−01	6.28E−02	4.09E−02	1.60E−02
65.00	1.42E+01	9.39E+00	7.62E−01	1.37E−01	4.85E−02	3.21E−02	1.30E−02
70.00	1.18E+01	7.83E+00	6.24E−01	1.06E−01	3.97E−02	2.66E−02	1.08E−02
75.00	1.01E+01	6.70E+00	5.34E−01	8.56E−02	3.41E−02	2.32E−02	9.30E−03
80.00	8.77E+00	5.88E+00	4.73E−01	7.19E−02	3.06E−02	2.09E−02	8.23E−03
85.00	7.80E+00	5.27E+00	4.30E−01	6.28E−02	2.83E−02	1.95E−02	7.49E−03
90.00	7.08E+00	4.82E+00	4.00E−01	5.70E−02	2.69E−02	1.86E−02	6.97E−03
95.00	6.56E+00	4.49E+00	3.79E−01	5.34E−02	2.60E−02	1.81E−02	6.61E−03
105.00	5.92E+00	4.07E+00	3.54E−01	5.01E−02	2.54E−02	1.77E−02	6.16E−03
120.00	5.56E+00	3.84E+00	3.40E−01	5.00E−02	2.58E−02	1.78E−02	5.81E−03
135.00	5.53E+00	3.81E+00	3.37E−01	5.20E−02	2.65E−02	1.81E−02	5.60E−03
150.00	5.61E+00	3.84E+00	3.38E−01	5.41E−02	2.71E−02	1.83E−02	5.46E−03
165.00	5.69E+00	3.89E+00	3.40E−01	5.55E−02	2.75E−02	1.84E−02	5.38E−03
180.00	5.72E+00	3.90E+00	3.40E−01	5.60E−02	2.76E−02	1.84E−02	5.35E−03
total	3.46E+02	2.61E+02	5.19E+01	1.40E+01	8.42E+00	6.54E+00	3.32E+00
rel ff	3.49E+02	2.65E+02	5.77E+01	1.39E+01	8.56E+00	6.72E+00	3.48E+00
nrl ff	3.76E+02	2.88E+02	6.62E+01	1.64E+01	1.02E+01	8.04E+00	4.19E+00

TABLE 1. Predicted *S*-matrix differential elastic scattering cross sections for photon energies (50.0, 59.54, 145.4, 316.5, 411.8, 468.1, 661.6, 778.9, 964.0, 1004.8, 1112.1, 1274.5, 1408.0 and 1500.0). The angle integrated total cross sections for each element and energies are presented. ''total'' represents total cross sections from this work, ''rel ff'' represents total cross sections calculated from the relativistic form factor and ''nrl ff'' represents total cross sections calculated from the nonrelativistic form factor—Continued[a]

θ (deg)	Photon energy (keV)						
	778.9	964.0	1004.8	1112.1	1274.5	1408.0	1500.0
Fernium ($Z=100$)							
0.00	7.69E+02	7.69E+02	7.69E+02	7.68E+02	7.68E+02	7.67E+02	7.66E+02
0.01	7.68E+02	7.67E+02	7.67E+02	7.67E+02	7.66E+02	7.65E+02	7.64E+02
0.02	7.67E+02	7.66E+02	7.66E+02	7.65E+02	7.63E+02	7.62E+02	7.60E+02
0.04	7.63E+02	7.59E+02	7.58E+02	7.56E+02	7.52E+02	7.48E+02	7.45E+02
0.06	7.56E+02	7.48E+02	7.47E+02	7.42E+02	7.35E+02	7.29E+02	7.24E+02
0.10	7.35E+02	7.20E+02	7.16E+02	7.07E+02	6.92E+02	6.80E+02	6.72E+02
0.20	6.68E+02	6.34E+02	6.26E+02	6.07E+02	5.77E+02	5.53E+02	5.38E+02
0.30	5.98E+02	5.48E+02	5.37E+02	5.09E+02	4.69E+02	4.38E+02	4.18E+02
0.40	5.29E+02	4.68E+02	4.55E+02	4.23E+02	3.79E+02	3.47E+02	3.27E+02
0.50	4.65E+02	3.98E+02	3.84E+02	3.51E+02	3.09E+02	2.79E+02	2.62E+02
0.60	4.08E+02	3.39E+02	3.26E+02	2.94E+02	2.54E+02	2.28E+02	2.13E+02
0.70	3.59E+02	2.92E+02	2.79E+02	2.49E+02	2.12E+02	1.89E+02	1.75E+02
0.80	3.17E+02	2.53E+02	2.41E+02	2.13E+02	1.79E+02	1.58E+02	1.45E+02
1.00	2.51E+02	1.94E+02	1.83E+02	1.60E+02	1.32E+02	1.14E+02	1.04E+02
1.20	2.02E+02	1.52E+02	1.43E+02	1.24E+02	1.00E+02	8.55E+01	7.70E+01
1.50	1.50E+02	1.10E+02	1.03E+02	8.72E+01	6.85E+01	5.64E+01	4.93E+01
1.70	1.26E+02	9.02E+01	8.41E+01	7.03E+01	5.36E+01	4.26E+01	3.60E+01
2.00	9.80E+01	6.80E+01	6.29E+01	5.13E+01	3.74E+01	2.83E+01	2.30E+01
2.50	6.63E+01	4.29E+01	3.91E+01	3.09E+01	2.19E+01	1.66E+01	1.38E+01
3.00	4.55E+01	2.75E+01	2.48E+01	1.95E+01	1.44E+01	1.22E+01	1.14E+01
3.50	3.19E+01	1.88E+01	1.70E+01	1.34E+01	1.05E+01	9.63E+00	9.74E+00
4.00	2.33E+01	1.40E+01	1.28E+01	1.02E+01	8.00E+00	7.09E+00	6.81E+00
5.00	1.43E+01	9.44E+00	8.70E+00	7.00E+00	4.75E+00	3.11E+00	2.14E+00
6.00	9.84E+00	6.45E+00	5.90E+00	4.57E+00	2.80E+00	1.58E+00	9.49E−01
7.00	7.00E+00	4.09E+00	3.65E+00	2.73E+00	1.74E+00	1.16E+00	8.57E−01
8.00	4.96E+00	2.57E+00	2.25E+00	1.66E+00	1.19E+00	1.04E+00	1.04E+00
9.00	3.53E+00	1.74E+00	1.52E+00	1.13E+00	8.80E−01	8.98E−01	1.05E+00
10.00	2.57E+00	1.31E+00	1.16E+00	8.82E−01	6.90E−01	6.80E−01	7.55E−01
12.50	1.39E+00	8.70E−01	7.94E−01	6.22E−01	3.96E−01	2.35E−01	1.45E−01
15.00	9.00E−01	5.74E−01	5.21E−01	3.90E−01	2.09E−01	9.48E−02	4.50E−02
17.50	6.15E−01	3.34E−01	2.92E−01	2.03E−01	1.09E−01	5.72E−02	3.36E−02
20.00	4.12E−01	1.88E−01	1.59E−01	1.06E−01	6.22E−02	4.42E−02	3.71E−02
22.50	2.72E−01	1.12E−01	9.35E−02	6.19E−02	4.05E−02	3.63E−02	3.95E−02
25.00	1.80E−01	7.30E−02	6.14E−02	4.16E−02	2.91E−02	2.87E−02	3.38E−02
27.50	1.23E−01	5.26E−02	4.48E−02	3.14E−02	2.24E−02	2.11E−02	2.32E−02
30.00	8.77E−02	4.07E−02	3.53E−02	2.56E−02	1.79E−02	1.48E−02	1.38E−02
35.00	5.00E−02	2.72E−02	2.43E−02	1.83E−02	1.14E−02	6.84E−03	4.32E−03
40.00	3.24E−02	1.90E−02	1.71E−02	1.28E−02	7.08E−03	3.37E−03	1.66E−03
45.00	2.27E−02	1.31E−02	1.17E−02	8.45E−03	4.32E−03	1.87E−03	8.50E−04
50.00	1.65E−02	8.97E−03	7.87E−03	5.43E−03	2.64E−03	1.15E−03	5.39E−04
55.00	1.24E−02	6.24E−03	5.38E−03	3.57E−03	1.72E−03	7.90E−04	4.09E−04
60.00	9.53E−03	4.50E−03	3.82E−03	2.48E−03	1.21E−03	6.14E−04	3.58E−04
65.00	7.53E−03	3.38E−03	2.85E−03	1.83E−03	9.24E−04	5.13E−04	3.34E−04
70.00	6.17E−03	2.69E−03	2.26E−03	1.44E−03	7.58E−04	4.58E−04	3.27E−04
75.00	5.25E−03	2.25E−03	1.89E−03	1.21E−03	6.60E−04	4.24E−04	3.23E−04
80.00	4.61E−03	1.97E−03	1.65E−03	1.07E−03	5.96E−04	3.99E−04	3.18E−04
85.00	4.17E−03	1.78E−03	1.49E−03	9.72E−04	5.53E−04	3.80E−04	3.09E−04
90.00	3.87E−03	1.65E−03	1.39E−03	9.08E−04	5.23E−04	3.65E−04	3.01E−04
95.00	3.65E−03	1.56E−03	1.31E−03	8.61E−04	5.00E−04	3.52E−04	2.92E−04
105.00	3.37E−03	1.43E−03	1.21E−03	7.97E−04	4.68E−04	3.33E−04	2.78E−04
120.00	3.13E−03	1.32E−03	1.11E−03	7.37E−04	4.38E−04	3.15E−04	2.65E−04
135.00	2.98E−03	1.25E−03	1.06E−03	7.05E−04	4.23E−04	3.06E−04	2.58E−04
150.00	2.88E−03	1.21E−03	1.02E−03	6.86E−04	4.16E−04	3.03E−04	2.56E−04
165.00	2.82E−03	1.19E−03	1.01E−03	6.76E−04	4.14E−04	3.04E−04	2.58E−04
180.00	2.80E−03	1.18E−03	1.00E−03	6.74E−04	4.14E−04	3.05E−04	2.59E−04
total	2.39E+00	1.57E+00	1.44E+00	1.18E+00	8.89E−01	7.25E−01	6.46E−01
rel ff	2.54E+00	1.68E+00	1.55E+00	1.27E+00	9.74E−01	8.03E−01	7.11E−01
nrl ff	3.07E+00	2.04E+00	1.88E+00	1.54E+00	1.18E+00	9.76E−01	8.64E−01

TABLE 1. Predicted *S*-matrix differential elastic scattering cross sections for photon energies (50.0, 59.54, 145.4, 316.5, 411.8, 468.1, 661.6, 778.9, 964.0, 1004.8, 1112.1, 1274.5, 1408.0 and 1500.0). The angle integrated total cross sections for each element and energies are presented. ''total'' represents total cross sections from this work, ''rel ff'' represents total cross sections calculated from the relativistic form factor and ''nrl ff'' represents total cross sections calculated from the nonrelativistic form factor—Continued[a]

θ (deg)	Photon energy (keV)						
	50.0	59.5	145.4	316.5	411.8	468.1	661.6
Mendelevium ($Z=101$)							
0.00	7.91E+02	7.86E+02	7.65E+02	7.87E+02	7.86E+02	7.85E+02	7.84E+02
0.01	7.91E+02	7.85E+02	7.65E+02	7.87E+02	7.85E+02	7.85E+02	7.84E+02
0.02	7.91E+02	7.85E+02	7.65E+02	7.86E+02	7.85E+02	7.84E+02	7.83E+02
0.04	7.91E+02	7.85E+02	7.65E+02	7.86E+02	7.84E+02	7.83E+02	7.80E+02
0.06	7.91E+02	7.85E+02	7.65E+02	7.85E+02	7.82E+02	7.80E+02	7.75E+02
0.10	7.90E+02	7.85E+02	7.64E+02	7.81E+02	7.75E+02	7.72E+02	7.59E+02
0.20	7.90E+02	7.84E+02	7.60E+02	7.64E+02	7.49E+02	7.40E+02	7.05E+02
0.30	7.90E+02	7.84E+02	7.53E+02	7.40E+02	7.14E+02	6.99E+02	6.45E+02
0.40	7.89E+02	7.82E+02	7.45E+02	7.13E+02	6.77E+02	6.57E+02	5.85E+02
0.50	7.87E+02	7.80E+02	7.36E+02	6.84E+02	6.40E+02	6.14E+02	5.26E+02
0.60	7.86E+02	7.77E+02	7.25E+02	6.56E+02	6.02E+02	5.71E+02	4.72E+02
0.70	7.84E+02	7.75E+02	7.13E+02	6.26E+02	5.64E+02	5.30E+02	4.22E+02
0.80	7.82E+02	7.72E+02	7.01E+02	5.97E+02	5.28E+02	4.91E+02	3.78E+02
1.00	7.77E+02	7.65E+02	6.75E+02	5.40E+02	4.61E+02	4.20E+02	3.05E+02
1.20	7.71E+02	7.57E+02	6.49E+02	4.87E+02	4.01E+02	3.59E+02	2.50E+02
1.50	7.60E+02	7.43E+02	6.10E+02	4.16E+02	3.28E+02	2.88E+02	1.91E+02
1.70	7.52E+02	7.33E+02	5.83E+02	3.74E+02	2.88E+02	2.50E+02	1.62E+02
2.00	7.40E+02	7.17E+02	5.44E+02	3.21E+02	2.40E+02	2.06E+02	1.29E+02
2.50	7.20E+02	6.91E+02	4.82E+02	2.52E+02	1.82E+02	1.54E+02	9.14E+01
3.00	7.00E+02	6.63E+02	4.26E+02	2.03E+02	1.42E+02	1.18E+02	6.63E+01
3.50	6.78E+02	6.36E+02	3.76E+02	1.66E+02	1.14E+02	9.24E+01	4.84E+01
4.00	6.57E+02	6.08E+02	3.32E+02	1.38E+02	9.22E+01	7.33E+01	3.55E+01
5.00	6.11E+02	5.54E+02	2.63E+02	9.79E+01	6.19E+01	4.73E+01	2.06E+01
6.00	5.65E+02	5.02E+02	2.12E+02	7.14E+01	4.19E+01	3.14E+01	1.40E+01
7.00	5.18E+02	4.53E+02	1.74E+02	5.29E+01	2.89E+01	2.17E+01	1.04E+01
8.00	4.73E+02	4.09E+02	1.44E+02	3.97E+01	2.09E+01	1.58E+01	7.98E+00
9.00	4.31E+02	3.70E+02	1.21E+02	3.03E+01	1.61E+01	1.21E+01	5.96E+00
10.00	3.92E+02	3.35E+02	1.03E+02	2.36E+01	1.30E+01	9.74E+00	4.37E+00
12.50	3.14E+02	2.64E+02	7.04E+01	1.40E+01	8.46E+00	6.08E+00	2.15E+00
15.00	2.59E+02	2.12E+02	4.87E+01	9.45E+00	5.36E+00	3.79E+00	1.34E+00
17.50	2.19E+02	1.72E+02	3.37E+01	6.74E+00	3.31E+00	2.35E+00	9.68E−01
20.00	1.87E+02	1.42E+02	2.37E+01	4.86E+00	2.16E+00	1.54E+00	7.13E−01
22.50	1.60E+02	1.18E+02	1.73E+01	3.51E+00	1.55E+00	1.11E+00	5.08E−01
25.00	1.36E+02	9.97E+01	1.32E+01	2.56E+00	1.20E+00	8.58E−01	3.52E−01
27.50	1.16E+02	8.44E+01	1.05E+01	1.90E+00	9.79E−01	6.88E−01	2.42E−01
30.00	9.85E+01	7.17E+01	8.68E+00	1.46E+00	8.05E−01	5.55E−01	1.68E−01
35.00	7.15E+01	5.20E+01	6.08E+00	9.52E−01	5.31E−01	3.52E−01	8.93E−02
40.00	5.26E+01	3.77E+01	4.21E+00	6.73E−01	3.35E−01	2.15E−01	5.44E−02
45.00	3.92E+01	2.74E+01	2.84E+00	4.90E−01	2.09E−01	1.32E−01	3.71E−02
50.00	2.98E+01	2.02E+01	1.91E+00	3.57E−01	1.34E−01	8.50E−02	2.72E−02
55.00	2.31E+01	1.53E+01	1.32E+00	2.60E−01	9.08E−02	5.80E−02	2.08E−02
60.00	1.83E+01	1.20E+01	9.66E−01	1.92E−01	6.55E−02	4.24E−02	1.64E−02
65.00	1.48E+01	9.63E+00	7.45E−01	1.44E−01	5.03E−02	3.31E−02	1.33E−02
70.00	1.23E+01	8.00E+00	6.07E−01	1.12E−01	4.10E−02	2.74E−02	1.12E−02
75.00	1.04E+01	6.84E+00	5.17E−01	8.99E−02	3.51E−02	2.38E−02	9.63E−03
80.00	9.09E+00	6.00E+00	4.57E−01	7.53E−02	3.14E−02	2.15E−02	8.55E−03
85.00	8.10E+00	5.38E+00	4.16E−01	6.58E−02	2.90E−02	2.00E−02	7.80E−03
90.00	7.36E+00	4.93E+00	3.87E−01	5.95E−02	2.75E−02	1.91E−02	7.28E−03
95.00	6.83E+00	4.60E+00	3.67E−01	5.56E−02	2.67E−02	1.86E−02	6.92E−03
105.00	6.20E+00	4.20E+00	3.43E−01	5.20E−02	2.61E−02	1.82E−02	6.47E−03
120.00	5.88E+00	3.98E+00	3.29E−01	5.19E−02	2.66E−02	1.84E−02	6.13E−03
135.00	5.89E+00	3.97E+00	3.25E−01	5.39E−02	2.74E−02	1.87E−02	5.92E−03
150.00	6.00E+00	4.02E+00	3.25E−01	5.60E−02	2.80E−02	1.90E−02	5.79E−03
165.00	6.10E+00	4.07E+00	3.25E−01	5.75E−02	2.84E−02	1.91E−02	5.70E−03
180.00	6.14E+00	4.09E+00	3.25E−01	5.80E−02	2.85E−02	1.92E−02	5.67E−03
total	3.57E+02	2.69E+02	5.25E+01	1.44E+01	8.65E+00	6.72E+00	3.41E+00
rel ff	—	—	—	—	—	—	—
nrl ff	—	—	—	—	—	—	—

TABLE 1. Predicted *S*-matrix differential elastic scattering cross sections for photon energies (50.0, 59.54, 145.4, 316.5, 411.8, 468.1, 661.6, 778.9, 964.0, 1004.8, 1112.1, 1274.5, 1408.0 and 1500.0). The angle integrated total cross sections for each element and energies are presented. ''total'' represents total cross sections from this work, ''rel ff'' represents total cross sections calculated from the relativistic form factor and ''nrl ff'' represents total cross sections calculated from the nonrelativistic form factor—Continued[a]

θ (deg)	Photon energy (keV)						
	778.9	964.0	1004.8	1112.1	1274.5	1408.0	1500.0
Mendelevium ($Z=101$)							
0.00	7.84E+02	7.84E+02	7.84E+02	7.83E+02	7.83E+02	7.82E+02	7.81E+02
0.01	7.83E+02	7.83E+02	7.82E+02	7.82E+02	7.81E+02	7.80E+02	7.80E+02
0.02	7.82E+02	7.81E+02	7.81E+02	7.80E+02	7.79E+02	7.77E+02	7.75E+02
0.04	7.78E+02	7.74E+02	7.73E+02	7.71E+02	7.67E+02	7.63E+02	7.60E+02
0.06	7.71E+02	7.64E+02	7.62E+02	7.57E+02	7.50E+02	7.44E+02	7.40E+02
0.10	7.51E+02	7.35E+02	7.32E+02	7.22E+02	7.08E+02	6.96E+02	6.87E+02
0.20	6.84E+02	6.49E+02	6.42E+02	6.22E+02	5.92E+02	5.68E+02	5.51E+02
0.30	6.13E+02	5.62E+02	5.51E+02	5.23E+02	4.82E+02	4.50E+02	4.29E+02
0.40	5.43E+02	4.80E+02	4.67E+02	4.34E+02	3.89E+02	3.55E+02	3.35E+02
0.50	4.77E+02	4.08E+02	3.94E+02	3.60E+02	3.15E+02	2.85E+02	2.67E+02
0.60	4.19E+02	3.47E+02	3.34E+02	3.01E+02	2.59E+02	2.33E+02	2.17E+02
0.70	3.68E+02	2.98E+02	2.85E+02	2.54E+02	2.16E+02	1.92E+02	1.79E+02
0.80	3.24E+02	2.58E+02	2.46E+02	2.17E+02	1.83E+02	1.61E+02	1.49E+02
1.00	2.56E+02	1.97E+02	1.87E+02	1.63E+02	1.35E+02	1.17E+02	1.07E+02
1.20	2.06E+02	1.55E+02	1.46E+02	1.26E+02	1.03E+02	8.76E+01	7.90E+01
1.50	1.53E+02	1.12E+02	1.05E+02	8.94E+01	7.05E+01	5.81E+01	5.08E+01
1.70	1.28E+02	9.24E+01	8.63E+01	7.23E+01	5.53E+01	4.40E+01	3.73E+01
2.00	1.00E+02	6.99E+01	6.48E+01	5.30E+01	3.87E+01	2.94E+01	2.38E+01
2.50	6.82E+01	4.44E+01	4.05E+01	3.20E+01	2.26E+01	1.70E+01	1.39E+01
3.00	4.70E+01	2.85E+01	2.58E+01	2.01E+01	1.48E+01	1.23E+01	1.13E+01
3.50	3.30E+01	1.94E+01	1.75E+01	1.38E+01	1.07E+01	9.78E+00	9.88E+00
4.00	2.41E+01	1.43E+01	1.30E+01	1.04E+01	8.16E+00	7.35E+00	7.22E+00
5.00	1.46E+01	9.58E+00	8.82E+00	7.10E+00	4.90E+00	3.30E+00	2.34E+00
6.00	1.00E+01	6.64E+00	6.08E+00	4.74E+00	2.91E+00	1.64E+00	9.73E−01
7.00	7.18E+00	4.27E+00	3.83E+00	2.87E+00	1.81E+00	1.17E+00	8.23E−01
8.00	5.12E+00	2.69E+00	2.37E+00	1.74E+00	1.23E+00	1.03E+00	9.93E−01
9.00	3.66E+00	1.81E+00	1.58E+00	1.17E+00	9.03E−01	9.12E−01	1.06E+00
10.00	2.67E+00	1.35E+00	1.19E+00	8.97E−01	7.06E−01	7.10E−01	8.09E−01
12.50	1.43E+00	8.82E−01	8.04E−01	6.30E−01	4.10E−01	2.53E−01	1.64E−01
15.00	9.22E−01	5.94E−01	5.40E−01	4.07E−01	2.20E−01	9.98E−02	4.73E−02
17.50	6.33E−01	3.51E−01	3.09E−01	2.17E−01	1.15E−01	5.84E−02	3.29E−02
20.00	4.28E−01	1.99E−01	1.69E−01	1.13E−01	6.52E−02	4.44E−02	3.56E−02
22.50	2.84E−01	1.18E−01	9.87E−02	6.51E−02	4.19E−02	3.65E−02	3.86E−02
25.00	1.89E−01	7.63E−02	6.40E−02	4.31E−02	2.99E−02	2.92E−02	3.44E−02
27.50	1.29E−01	5.43E−02	4.61E−02	3.20E−02	2.29E−02	2.19E−02	2.46E−02
30.00	9.16E−02	4.16E−02	3.60E−02	2.59E−02	1.82E−02	1.56E−02	1.50E−02
35.00	5.17E−02	2.77E−02	2.47E−02	1.85E−02	1.17E−02	7.27E−03	4.79E−03
40.00	3.32E−02	1.94E−02	1.75E−02	1.31E−02	7.36E−03	3.59E−03	1.80E−03
45.00	2.32E−02	1.35E−02	1.21E−02	8.80E−03	4.55E−03	1.99E−03	9.08E−04
50.00	1.69E−02	9.32E−03	8.21E−03	5.73E−03	2.82E−03	1.22E−03	5.71E−04
55.00	1.27E−02	6.54E−03	5.66E−03	3.80E−03	1.84E−03	8.44E−04	4.30E−04
60.00	9.83E−03	4.74E−03	4.05E−03	2.65E−03	1.31E−03	6.58E−04	3.77E−04
65.00	7.81E−03	3.58E−03	3.03E−03	1.96E−03	9.99E−04	5.51E−04	3.53E−04
70.00	6.43E−03	2.86E−03	2.41E−03	1.56E−03	8.21E−04	4.92E−04	3.46E−04
75.00	5.49E−03	2.40E−03	2.02E−03	1.31E−03	7.15E−04	4.56E−04	3.43E−04
80.00	4.83E−03	2.10E−03	1.77E−03	1.15E−03	6.45E−04	4.30E−04	3.38E−04
85.00	4.39E−03	1.90E−03	1.60E−03	1.05E−03	5.99E−04	4.09E−04	3.30E−04
90.00	4.08E−03	1.77E−03	1.49E−03	9.81E−04	5.67E−04	3.94E−04	3.22E−04
95.00	3.86E−03	1.67E−03	1.41E−03	9.31E−04	5.42E−04	3.80E−04	3.13E−04
105.00	3.58E−03	1.54E−03	1.30E−03	8.62E−04	5.07E−04	3.59E−04	2.98E−04
120.00	3.33E−03	1.42E−03	1.20E−03	7.97E−04	4.74E−04	3.40E−04	2.84E−04
135.00	3.18E−03	1.35E−03	1.14E−03	7.63E−04	4.58E−04	3.30E−04	2.76E−04
150.00	3.08E−03	1.31E−03	1.11E−03	7.42E−04	4.49E−04	3.26E−04	2.74E−04
165.00	3.02E−03	1.28E−03	1.09E−03	7.32E−04	4.47E−04	3.27E−04	2.76E−04
180.00	3.00E−03	1.27E−03	1.08E−03	7.29E−04	4.47E−04	3.28E−04	2.78E−04
total	2.46E+00	1.61E+00	1.48E+00	1.21E+00	9.14E−01	7.45E−01	6.64E−01
rel ff	—	—	—	—	—	—	—
nrl ff	—	—	—	—	—	—	—

TABLE 1. Predicted *S*-matrix differential elastic scattering cross sections for photon energies (50.0, 59.54, 145.4, 316.5, 411.8, 468.1, 661.6, 778.9, 964.0, 1004.8, 1112.1, 1274.5, 1408.0 and 1500.0). The angle integrated total cross sections for each element and energies are presented. ''total'' represents total cross sections from this work, ''rel ff'' represents total cross sections calculated from the relativistic form factor and ''nrl ff'' represents total cross sections calculated from the nonrelativistic form factor—Continued[a]

θ (deg)	Photon energy (keV)						
	50.0	59.5	145.4	316.5	411.8	468.1	661.6
Nobelium ($Z=102$)							
0.00	8.07E+02	8.01E+02	7.78E+02	8.02E+02	8.01E+02	8.01E+02	8.00E+02
0.01	8.07E+02	8.01E+02	7.78E+02	8.02E+02	8.00E+02	8.00E+02	7.99E+02
0.02	8.07E+02	8.01E+02	7.78E+02	8.02E+02	8.00E+02	8.00E+02	7.98E+02
0.04	8.07E+02	8.01E+02	7.78E+02	8.01E+02	7.99E+02	7.98E+02	7.95E+02
0.06	8.06E+02	8.00E+02	7.78E+02	8.00E+02	7.97E+02	7.96E+02	7.90E+02
0.10	8.06E+02	8.00E+02	7.77E+02	7.96E+02	7.91E+02	7.88E+02	7.75E+02
0.20	8.06E+02	8.00E+02	7.73E+02	7.79E+02	7.65E+02	7.56E+02	7.21E+02
0.30	8.06E+02	7.99E+02	7.66E+02	7.56E+02	7.30E+02	7.15E+02	6.61E+02
0.40	8.05E+02	7.97E+02	7.59E+02	7.29E+02	6.94E+02	6.73E+02	6.00E+02
0.50	8.03E+02	7.95E+02	7.49E+02	7.00E+02	6.55E+02	6.29E+02	5.40E+02
0.60	8.02E+02	7.93E+02	7.38E+02	6.72E+02	6.17E+02	5.86E+02	4.84E+02
0.70	8.00E+02	7.90E+02	7.27E+02	6.42E+02	5.79E+02	5.44E+02	4.33E+02
0.80	7.98E+02	7.87E+02	7.15E+02	6.13E+02	5.42E+02	5.04E+02	3.87E+02
1.00	7.93E+02	7.80E+02	6.89E+02	5.55E+02	4.73E+02	4.30E+02	3.12E+02
1.20	7.87E+02	7.72E+02	6.63E+02	5.00E+02	4.11E+02	3.68E+02	2.55E+02
1.50	7.77E+02	7.59E+02	6.23E+02	4.26E+02	3.35E+02	2.94E+02	1.94E+02
1.70	7.69E+02	7.49E+02	5.97E+02	3.83E+02	2.94E+02	2.55E+02	1.65E+02
2.00	7.57E+02	7.34E+02	5.57E+02	3.28E+02	2.45E+02	2.10E+02	1.31E+02
2.50	7.37E+02	7.07E+02	4.94E+02	2.57E+02	1.86E+02	1.56E+02	9.35E+01
3.00	7.17E+02	6.80E+02	4.35E+02	2.06E+02	1.45E+02	1.20E+02	6.82E+01
3.50	6.96E+02	6.52E+02	3.84E+02	1.69E+02	1.16E+02	9.46E+01	5.00E+01
4.00	6.74E+02	6.24E+02	3.39E+02	1.40E+02	9.44E+01	7.53E+01	3.68E+01
5.00	6.29E+02	5.68E+02	2.67E+02	1.00E+02	6.38E+01	4.88E+01	2.12E+01
6.00	5.82E+02	5.15E+02	2.15E+02	7.34E+01	4.34E+01	3.25E+01	1.42E+01
7.00	5.34E+02	4.65E+02	1.76E+02	5.45E+01	2.99E+01	2.25E+01	1.06E+01
8.00	4.87E+02	4.20E+02	1.46E+02	4.10E+01	2.15E+01	1.63E+01	8.16E+00
9.00	4.43E+02	3.79E+02	1.23E+02	3.13E+01	1.64E+01	1.24E+01	6.16E+00
10.00	4.03E+02	3.43E+02	1.05E+02	2.44E+01	1.32E+01	9.91E+00	4.55E+00
12.50	3.21E+02	2.69E+02	7.17E+01	1.44E+01	8.64E+00	6.23E+00	2.23E+00
15.00	2.63E+02	2.16E+02	4.97E+01	9.63E+00	5.55E+00	3.92E+00	1.37E+00
17.50	2.23E+02	1.75E+02	3.45E+01	6.89E+00	3.45E+00	2.44E+00	9.87E−01
20.00	1.91E+02	1.45E+02	2.42E+01	4.99E+00	2.23E+00	1.60E+00	7.32E−01
22.50	1.64E+02	1.21E+02	1.75E+01	3.62E+00	1.59E+00	1.14E+00	5.27E−01
25.00	1.40E+02	1.02E+02	1.33E+01	2.65E+00	1.23E+00	8.75E−01	3.68E−01
27.50	1.20E+02	8.64E+01	1.05E+01	1.97E+00	9.96E−01	7.02E−01	2.54E−01
30.00	1.02E+02	7.36E+01	8.63E+00	1.51E+00	8.22E−01	5.69E−01	1.77E−01
35.00	7.43E+01	5.36E+01	6.05E+00	9.75E−01	5.49E−01	3.65E−01	9.33E−02
40.00	5.48E+01	3.90E+01	4.21E+00	6.89E−01	3.50E−01	2.25E−01	5.63E−02
45.00	4.10E+01	2.85E+01	2.85E+00	5.04E−01	2.20E−01	1.39E−01	3.81E−02
50.00	3.12E+01	2.10E+01	1.91E+00	3.69E−01	1.41E−01	8.93E−02	2.78E−02
55.00	2.41E+01	1.59E+01	1.32E+00	2.71E−01	9.52E−02	6.07E−02	2.12E−02
60.00	1.90E+01	1.23E+01	9.51E−01	2.00E−01	6.83E−02	4.41E−02	1.68E−02
65.00	1.54E+01	9.88E+00	7.27E−01	1.51E−01	5.22E−02	3.42E−02	1.37E−02
70.00	1.28E+01	8.18E+00	5.88E−01	1.17E−01	4.23E−02	2.82E−02	1.15E−02
75.00	1.08E+01	6.98E+00	4.99E−01	9.44E−02	3.61E−02	2.44E−02	9.95E−03
80.00	9.43E+00	6.12E+00	4.40E−01	7.90E−02	3.22E−02	2.20E−02	8.86E−03
85.00	8.40E+00	5.49E+00	4.01E−01	6.88E−02	2.97E−02	2.05E−02	8.11E−03
90.00	7.65E+00	5.04E+00	3.73E−01	6.22E−02	2.82E−02	1.96E−02	7.59E−03
95.00	7.12E+00	4.71E+00	3.54E−01	5.80E−02	2.73E−02	1.91E−02	7.23E−03
105.00	6.49E+00	4.32E+00	3.31E−01	5.41E−02	2.68E−02	1.87E−02	6.79E−03
120.00	6.21E+00	4.13E+00	3.17E−01	5.38E−02	2.73E−02	1.90E−02	6.45E−03
135.00	6.27E+00	4.14E+00	3.12E−01	5.58E−02	2.82E−02	1.94E−02	6.26E−03
150.00	6.42E+00	4.21E+00	3.10E−01	5.80E−02	2.89E−02	1.97E−02	6.12E−03
165.00	6.54E+00	4.26E+00	3.09E−01	5.96E−02	2.93E−02	1.98E−02	6.04E−03
180.00	6.58E+00	4.28E+00	3.08E−01	6.01E−02	2.95E−02	1.99E−02	6.01E−03
total	3.69E+02	2.76E+02	5.30E+01	1.47E+01	8.88E+00	6.90E+00	3.50E+00
rel ff	—	—	—	—	—	—	—
nrl ff	—	—	—	—	—	—	—

TABLE 1. Predicted *S*-matrix differential elastic scattering cross sections for photon energies (50.0, 59.54, 145.4, 316.5, 411.8, 468.1, 661.6, 778.9, 964.0, 1004.8, 1112.1, 1274.5, 1408.0 and 1500.0). The angle integrated total cross sections for each element and energies are presented. ''total'' represents total cross sections from this work, ''rel ff'' represents total cross sections calculated from the relativistic form factor and ''nrl ff'' represents total cross sections calculated from the nonrelativistic form factor—Continued[a]

θ (deg)	Photon energy (keV)						
	778.9	964.0	1004.8	1112.1	1274.5	1408.0	1500.0
Nobelium ($Z=102$)							
0.00	7.99E+02	7.99E+02	7.99E+02	7.98E+02	7.98E+02	7.97E+02	7.97E+02
0.01	7.98E+02	7.98E+02	7.98E+02	7.97E+02	7.96E+02	7.96E+02	7.95E+02
0.02	7.98E+02	7.97E+02	7.96E+02	7.95E+02	7.94E+02	7.92E+02	7.90E+02
0.04	7.93E+02	7.90E+02	7.89E+02	7.86E+02	7.82E+02	7.79E+02	7.76E+02
0.06	7.86E+02	7.79E+02	7.77E+02	7.73E+02	7.66E+02	7.60E+02	7.56E+02
0.10	7.66E+02	7.51E+02	7.48E+02	7.38E+02	7.24E+02	7.12E+02	7.03E+02
0.20	7.00E+02	6.66E+02	6.58E+02	6.38E+02	6.07E+02	5.82E+02	5.65E+02
0.30	6.28E+02	5.77E+02	5.65E+02	5.36E+02	4.94E+02	4.62E+02	4.40E+02
0.40	5.57E+02	4.93E+02	4.79E+02	4.45E+02	3.98E+02	3.64E+02	3.42E+02
0.50	4.90E+02	4.18E+02	4.04E+02	3.69E+02	3.23E+02	2.91E+02	2.73E+02
0.60	4.30E+02	3.56E+02	3.41E+02	3.07E+02	2.65E+02	2.37E+02	2.22E+02
0.70	3.77E+02	3.04E+02	2.91E+02	2.59E+02	2.20E+02	1.96E+02	1.83E+02
0.80	3.32E+02	2.63E+02	2.50E+02	2.21E+02	1.86E+02	1.64E+02	1.52E+02
1.00	2.61E+02	2.01E+02	1.90E+02	1.66E+02	1.37E+02	1.20E+02	1.10E+02
1.20	2.09E+02	1.58E+02	1.49E+02	1.29E+02	1.05E+02	8.98E+01	8.10E+01
1.50	1.56E+02	1.15E+02	1.08E+02	9.16E+01	7.24E+01	5.99E+01	5.24E+01
1.70	1.31E+02	9.46E+01	8.84E+01	7.43E+01	5.71E+01	4.56E+01	3.86E+01
2.00	1.03E+02	7.19E+01	6.66E+01	5.47E+01	4.01E+01	3.05E+01	2.47E+01
2.50	7.02E+01	4.59E+01	4.20E+01	3.32E+01	2.34E+01	1.74E+01	1.41E+01
3.00	4.86E+01	2.96E+01	2.67E+01	2.09E+01	1.52E+01	1.24E+01	1.12E+01
3.50	3.42E+01	2.00E+01	1.80E+01	1.41E+01	1.09E+01	9.91E+00	9.98E+00
4.00	2.48E+01	1.46E+01	1.32E+01	1.05E+01	8.31E+00	7.62E+00	7.64E+00
5.00	1.49E+01	9.70E+00	8.92E+00	7.19E+00	5.04E+00	3.51E+00	2.57E+00
6.00	1.02E+01	6.83E+00	6.27E+00	4.91E+00	3.02E+00	1.70E+00	1.00E+00
7.00	7.36E+00	4.46E+00	4.01E+00	3.02E+00	1.88E+00	1.17E+00	7.89E−01
8.00	5.28E+00	2.82E+00	2.48E+00	1.83E+00	1.27E+00	1.03E+00	9.44E−01
9.00	3.79E+00	1.88E+00	1.64E+00	1.21E+00	9.27E−01	9.23E−01	1.06E+00
10.00	2.76E+00	1.38E+00	1.21E+00	9.13E−01	7.22E−01	7.40E−01	8.65E−01
12.50	1.47E+00	8.94E−01	8.14E−01	6.37E−01	4.23E−01	2.74E−01	1.87E−01
15.00	9.44E−01	6.14E−01	5.60E−01	4.25E−01	2.31E−01	1.05E−01	4.99E−02
17.50	6.51E−01	3.70E−01	3.27E−01	2.31E−01	1.21E−01	5.97E−02	3.23E−02
20.00	4.45E−01	2.11E−01	1.80E−01	1.20E−01	6.83E−02	4.46E−02	3.40E−02
22.50	2.98E−01	1.24E−01	1.04E−01	6.87E−02	4.34E−02	3.67E−02	3.75E−02
25.00	1.99E−01	7.98E−02	6.68E−02	4.47E−02	3.06E−02	2.97E−02	3.48E−02
27.50	1.36E−01	5.61E−02	4.75E−02	3.27E−02	2.33E−02	2.26E−02	2.60E−02
30.00	9.57E−02	4.26E−02	3.67E−02	2.62E−02	1.85E−02	1.63E−02	1.64E−02
35.00	5.36E−02	2.81E−02	2.50E−02	1.87E−02	1.20E−02	7.73E−03	5.32E−03
40.00	3.41E−02	1.98E−02	1.78E−02	1.34E−02	7.64E−03	3.82E−03	1.97E−03
45.00	2.37E−02	1.39E−02	1.25E−02	9.14E−03	4.79E−03	2.11E−03	9.71E−04
50.00	1.73E−02	9.68E−03	8.56E−03	6.03E−03	3.00E−03	1.30E−03	6.04E−04
55.00	1.31E−02	6.84E−03	5.95E−03	4.04E−03	1.98E−03	9.01E−04	4.53E−04
60.00	1.01E−02	4.98E−03	4.28E−03	2.84E−03	1.41E−03	7.04E−04	3.97E−04
65.00	8.09E−03	3.79E−03	3.22E−03	2.11E−03	1.08E−03	5.90E−04	3.72E−04
70.00	6.69E−03	3.03E−03	2.57E−03	1.67E−03	8.89E−04	5.28E−04	3.66E−04
75.00	5.73E−03	2.56E−03	2.16E−03	1.41E−03	7.74E−04	4.90E−04	3.64E−04
80.00	5.07E−03	2.24E−03	1.89E−03	1.24E−03	6.99E−04	4.62E−04	3.59E−04
85.00	4.62E−03	2.03E−03	1.72E−03	1.13E−03	6.49E−04	4.41E−04	3.51E−04
90.00	4.30E−03	1.89E−03	1.60E−03	1.06E−03	6.14E−04	4.24E−04	3.44E−04
95.00	4.08E−03	1.79E−03	1.52E−03	1.01E−03	5.87E−04	4.09E−04	3.35E−04
105.00	3.79E−03	1.66E−03	1.40E−03	9.32E−04	5.49E−04	3.88E−04	3.20E−04
120.00	3.54E−03	1.53E−03	1.29E−03	8.63E−04	5.14E−04	3.66E−04	3.05E−04
135.00	3.39E−03	1.46E−03	1.23E−03	8.26E−04	4.96E−04	3.56E−04	2.97E−04
150.00	3.29E−03	1.41E−03	1.19E−03	8.02E−04	4.86E−04	3.51E−04	2.94E−04
165.00	3.22E−03	1.38E−03	1.17E−03	7.91E−04	4.83E−04	3.52E−04	2.96E−04
180.00	3.20E−03	1.37E−03	1.17E−03	7.88E−04	4.83E−04	3.53E−04	2.97E−04
total	2.52E+00	1.65E+00	1.52E+00	1.24E+00	9.39E−01	7.66E−01	6.83E−01
rel ff	—	—	—	—	—	—	—
nrl ff	—	—	—	—	—	—	—

TABLE 1. Predicted *S*-matrix differential elastic scattering cross sections for photon energies (50.0, 59.54, 145.4, 316.5, 411.8, 468.1, 661.6, 778.9, 964.0, 1004.8, 1112.1, 1274.5, 1408.0 and 1500.0). The angle integrated total cross sections for each element and energies are presented. ''total'' represents total cross sections from this work, ''rel ff'' represents total cross sections calculated from the relativistic form factor and ''nrl ff'' represents total cross sections calculated from the nonrelativistic form factor—Continued[a]

θ (deg)	Photon energy (keV)						
	50.0	59.5	145.4	316.5	411.8	468.1	661.6
Lawrencium ($Z=103$)							
0.00	8.23E+02	8.16E+02	7.91E+02	8.18E+02	8.16E+02	8.16E+02	8.15E+02
0.01	8.23E+02	8.16E+02	7.91E+02	8.17E+02	8.16E+02	8.15E+02	8.14E+02
0.02	8.23E+02	8.16E+02	7.91E+02	8.17E+02	8.15E+02	8.15E+02	8.14E+02
0.04	8.23E+02	8.16E+02	7.91E+02	8.16E+02	8.14E+02	8.14E+02	8.11E+02
0.06	8.23E+02	8.16E+02	7.90E+02	8.15E+02	8.12E+02	8.11E+02	8.06E+02
0.10	8.22E+02	8.16E+02	7.90E+02	8.11E+02	8.06E+02	8.03E+02	7.91E+02
0.20	8.22E+02	8.15E+02	7.86E+02	7.95E+02	7.81E+02	7.72E+02	7.38E+02
0.30	8.22E+02	8.14E+02	7.79E+02	7.73E+02	7.47E+02	7.32E+02	6.78E+02
0.40	8.21E+02	8.13E+02	7.72E+02	7.45E+02	7.10E+02	6.89E+02	6.16E+02
0.50	8.19E+02	8.11E+02	7.62E+02	7.17E+02	6.72E+02	6.45E+02	5.55E+02
0.60	8.18E+02	8.08E+02	7.52E+02	6.88E+02	6.33E+02	6.01E+02	4.97E+02
0.70	8.17E+02	8.06E+02	7.41E+02	6.58E+02	5.94E+02	5.58E+02	4.44E+02
0.80	8.14E+02	8.03E+02	7.29E+02	6.29E+02	5.57E+02	5.17E+02	3.97E+02
1.00	8.10E+02	7.96E+02	7.04E+02	5.69E+02	4.85E+02	4.41E+02	3.19E+02
1.20	8.04E+02	7.88E+02	6.77E+02	5.13E+02	4.22E+02	3.77E+02	2.60E+02
1.50	7.94E+02	7.75E+02	6.37E+02	4.37E+02	3.43E+02	3.00E+02	1.98E+02
1.70	7.86E+02	7.65E+02	6.10E+02	3.93E+02	3.00E+02	2.60E+02	1.68E+02
2.00	7.74E+02	7.50E+02	5.70E+02	3.35E+02	2.50E+02	2.13E+02	1.34E+02
2.50	7.54E+02	7.24E+02	5.05E+02	2.62E+02	1.89E+02	1.59E+02	9.57E+01
3.00	7.34E+02	6.96E+02	4.45E+02	2.10E+02	1.48E+02	1.23E+02	7.02E+01
3.50	7.14E+02	6.68E+02	3.92E+02	1.72E+02	1.18E+02	9.68E+01	5.17E+01
4.00	6.93E+02	6.40E+02	3.45E+02	1.43E+02	9.65E+01	7.72E+01	3.82E+01
5.00	6.47E+02	5.84E+02	2.72E+02	1.02E+02	6.56E+01	5.03E+01	2.19E+01
6.00	6.00E+02	5.29E+02	2.18E+02	7.53E+01	4.49E+01	3.36E+01	1.45E+01
7.00	5.50E+02	4.78E+02	1.78E+02	5.61E+01	3.10E+01	2.32E+01	1.08E+01
8.00	5.02E+02	4.31E+02	1.48E+02	4.23E+01	2.22E+01	1.67E+01	8.34E+00
9.00	4.56E+02	3.88E+02	1.25E+02	3.23E+01	1.68E+01	1.27E+01	6.35E+00
10.00	4.13E+02	3.51E+02	1.06E+02	2.51E+01	1.35E+01	1.01E+01	4.73E+00
12.50	3.27E+02	2.75E+02	7.28E+01	1.47E+01	8.81E+00	6.36E+00	2.31E+00
15.00	2.68E+02	2.20E+02	5.08E+01	9.82E+00	5.74E+00	4.06E+00	1.39E+00
17.50	2.26E+02	1.79E+02	3.53E+01	7.03E+00	3.59E+00	2.54E+00	1.00E+00
20.00	1.94E+02	1.48E+02	2.48E+01	5.13E+00	2.31E+00	1.65E+00	7.51E−01
22.50	1.68E+02	1.23E+02	1.78E+01	3.74E+00	1.63E+00	1.17E+00	5.47E−01
25.00	1.44E+02	1.04E+02	1.34E+01	2.74E+00	1.25E+00	8.93E−01	3.86E−01
27.50	1.23E+02	8.84E+01	1.05E+01	2.04E+00	1.01E+00	7.16E−01	2.68E−01
30.00	1.05E+02	7.54E+01	8.57E+00	1.56E+00	8.38E−01	5.83E−01	1.87E−01
35.00	7.71E+01	5.52E+01	6.01E+00	9.99E−01	5.66E−01	3.78E−01	9.75E−02
40.00	5.71E+01	4.04E+01	4.20E+00	7.05E−01	3.65E−01	2.36E−01	5.82E−02
45.00	4.29E+01	2.95E+01	2.85E+00	5.17E−01	2.31E−01	1.46E−01	3.90E−02
50.00	3.26E+01	2.18E+01	1.92E+00	3.82E−01	1.49E−01	9.39E−02	2.84E−02
55.00	2.52E+01	1.64E+01	1.31E+00	2.82E−01	9.99E−02	6.35E−02	2.17E−02
60.00	1.99E+01	1.27E+01	9.35E−01	2.10E−01	7.13E−02	4.59E−02	1.72E−02
65.00	1.60E+01	1.01E+01	7.08E−01	1.59E−01	5.42E−02	3.54E−02	1.40E−02
70.00	1.32E+01	8.36E+00	5.68E−01	1.23E−01	4.37E−02	2.90E−02	1.18E−02
75.00	1.12E+01	7.11E+00	4.80E−01	9.92E−02	3.72E−02	2.50E−02	1.03E−02
80.00	9.76E+00	6.23E+00	4.23E−01	8.29E−02	3.30E−02	2.25E−02	9.18E−03
85.00	8.70E+00	5.59E+00	3.85E−01	7.21E−02	3.05E−02	2.10E−02	8.43E−03
90.00	7.94E+00	5.14E+00	3.59E−01	6.50E−02	2.89E−02	2.00E−02	7.91E−03
95.00	7.40E+00	4.81E+00	3.40E−01	6.05E−02	2.80E−02	1.95E−02	7.55E−03
105.00	6.79E+00	4.44E+00	3.19E−01	5.63E−02	2.75E−02	1.92E−02	7.12E−03
120.00	6.56E+00	4.28E+00	3.05E−01	5.58E−02	2.80E−02	1.95E−02	6.79E−03
135.00	6.67E+00	4.31E+00	2.98E−01	5.79E−02	2.90E−02	2.00E−02	6.60E−03
150.00	6.86E+00	4.39E+00	2.94E−01	6.01E−02	2.98E−02	2.03E−02	6.47E−03
165.00	7.01E+00	4.46E+00	2.92E−01	6.17E−02	3.03E−02	2.05E−02	6.39E−03
180.00	7.07E+00	4.48E+00	2.91E−01	6.23E−02	3.04E−02	2.06E−02	6.36E−03
total	3.82E+02	2.83E+02	5.35E+01	1.51E+01	9.11E+00	7.08E+00	3.60E+00
rel ff	—	—	—	—	—	—	—
nrl ff	—	—	—	—	—	—	—

TABLE 1. Predicted *S*-matrix differential elastic scattering cross sections for photon energies (50.0, 59.54, 145.4, 316.5, 411.8, 468.1, 661.6, 778.9, 964.0, 1004.8, 1112.1, 1274.5, 1408.0 and 1500.0). The angle integrated total cross sections for each element and energies are presented. ''total'' represents total cross sections from this work, ''rel ff'' represents total cross sections calculated from the relativistic form factor and ''nrl ff'' represents total cross sections calculated from the nonrelativistic form factor—Continued[a]

θ (deg)	Photon energy (keV)						
	778.9	964.0	1004.8	1112.1	1274.5	1408.0	1500.0
Lawrencium ($Z=103$)							
0.00	8.15E+02	8.14E+02	8.14E+02	8.14E+02	8.13E+02	8.12E+02	8.12E+02
0.01	8.14E+02	8.13E+02	8.13E+02	8.13E+02	8.12E+02	8.11E+02	8.10E+02
0.02	8.13E+02	8.12E+02	8.12E+02	8.11E+02	8.09E+02	8.07E+02	8.06E+02
0.04	8.09E+02	8.05E+02	8.04E+02	8.02E+02	7.98E+02	7.94E+02	7.92E+02
0.06	8.02E+02	7.95E+02	7.93E+02	7.89E+02	7.82E+02	7.76E+02	7.72E+02
0.10	7.82E+02	7.68E+02	7.64E+02	7.55E+02	7.40E+02	7.28E+02	7.20E+02
0.20	7.17E+02	6.82E+02	6.74E+02	6.54E+02	6.23E+02	5.97E+02	5.80E+02
0.30	6.44E+02	5.92E+02	5.80E+02	5.51E+02	5.08E+02	4.74E+02	4.52E+02
0.40	5.72E+02	5.06E+02	4.92E+02	4.57E+02	4.08E+02	3.72E+02	3.50E+02
0.50	5.03E+02	4.29E+02	4.14E+02	3.78E+02	3.30E+02	2.97E+02	2.78E+02
0.60	4.41E+02	3.64E+02	3.49E+02	3.14E+02	2.70E+02	2.41E+02	2.26E+02
0.70	3.86E+02	3.11E+02	2.97E+02	2.64E+02	2.24E+02	2.00E+02	1.86E+02
0.80	3.39E+02	2.68E+02	2.55E+02	2.25E+02	1.89E+02	1.67E+02	1.56E+02
1.00	2.66E+02	2.04E+02	1.93E+02	1.69E+02	1.40E+02	1.22E+02	1.12E+02
1.20	2.13E+02	1.61E+02	1.52E+02	1.31E+02	1.07E+02	9.19E+01	8.30E+01
1.50	1.59E+02	1.17E+02	1.10E+02	9.38E+01	7.44E+01	6.16E+01	5.39E+01
1.70	1.34E+02	9.68E+01	9.06E+01	7.63E+01	5.89E+01	4.72E+01	4.00E+01
2.00	1.05E+02	7.38E+01	6.85E+01	5.64E+01	4.16E+01	3.16E+01	2.57E+01
2.50	7.21E+01	4.75E+01	4.35E+01	3.44E+01	2.41E+01	1.78E+01	1.43E+01
3.00	5.02E+01	3.07E+01	2.78E+01	2.16E+01	1.55E+01	1.25E+01	1.11E+01
3.50	3.54E+01	2.06E+01	1.86E+01	1.45E+01	1.11E+01	1.00E+01	1.00E+01
4.00	2.56E+01	1.49E+01	1.35E+01	1.07E+01	8.46E+00	7.88E+00	8.08E+00
5.00	1.53E+01	9.81E+00	9.01E+00	7.27E+00	5.19E+00	3.74E+00	2.84E+00
6.00	1.04E+01	7.01E+00	6.45E+00	5.08E+00	3.14E+00	1.76E+00	1.03E+00
7.00	7.54E+00	4.65E+00	4.20E+00	3.18E+00	1.95E+00	1.17E+00	7.55E−01
8.00	5.45E+00	2.96E+00	2.61E+00	1.93E+00	1.31E+00	1.02E+00	8.93E−01
9.00	3.93E+00	1.95E+00	1.71E+00	1.26E+00	9.51E−01	9.32E−01	1.05E+00
10.00	2.87E+00	1.41E+00	1.24E+00	9.30E−01	7.37E−01	7.70E−01	9.21E−01
12.50	1.51E+00	9.05E−01	8.22E−01	6.43E−01	4.36E−01	2.96E−01	2.13E−01
15.00	9.65E−01	6.33E−01	5.79E−01	4.42E−01	2.43E−01	1.12E−01	5.28E−02
17.50	6.70E−01	3.89E−01	3.45E−01	2.46E−01	1.28E−01	6.11E−02	3.17E−02
20.00	4.62E−01	2.24E−01	1.92E−01	1.29E−01	7.17E−02	4.47E−02	3.23E−02
22.50	3.11E−01	1.32E−01	1.10E−01	7.26E−02	4.50E−02	3.68E−02	3.63E−02
25.00	2.09E−01	8.35E−02	6.98E−02	4.64E−02	3.14E−02	3.02E−02	3.51E−02
27.50	1.42E−01	5.80E−02	4.89E−02	3.34E−02	2.37E−02	2.33E−02	2.73E−02
30.00	1.00E−01	4.36E−02	3.74E−02	2.64E−02	1.88E−02	1.71E−02	1.78E−02
35.00	5.55E−02	2.85E−02	2.53E−02	1.88E−02	1.22E−02	8.21E−03	5.91E−03
40.00	3.50E−02	2.01E−02	1.81E−02	1.37E−02	7.92E−03	4.06E−03	2.15E−03
45.00	2.43E−02	1.43E−02	1.28E−02	9.49E−03	5.04E−03	2.25E−03	1.04E−03
50.00	1.77E−02	1.00E−02	8.91E−03	6.34E−03	3.19E−03	1.39E−03	6.38E−04
55.00	1.34E−02	7.14E−03	6.25E−03	4.29E−03	2.12E−03	9.61E−04	4.76E−04
60.00	1.04E−02	5.24E−03	4.52E−03	3.03E−03	1.52E−03	7.52E−04	4.18E−04
65.00	8.37E−03	4.00E−03	3.42E−03	2.26E−03	1.17E−03	6.32E−04	3.92E−04
70.00	6.95E−03	3.22E−03	2.74E−03	1.80E−03	9.62E−04	5.66E−04	3.86E−04
75.00	5.98E−03	2.72E−03	2.31E−03	1.52E−03	8.38E−04	5.26E−04	3.85E−04
80.00	5.31E−03	2.39E−03	2.03E−03	1.34E−03	7.57E−04	4.97E−04	3.81E−04
85.00	4.85E−03	2.17E−03	1.84E−03	1.22E−03	7.03E−04	4.74E−04	3.74E−04
90.00	4.53E−03	2.03E−03	1.72E−03	1.15E−03	6.66E−04	4.57E−04	3.67E−04
95.00	4.30E−03	1.92E−03	1.63E−03	1.09E−03	6.36E−04	4.41E−04	3.58E−04
105.00	4.02E−03	1.78E−03	1.51E−03	1.01E−03	5.95E−04	4.18E−04	3.43E−04
120.00	3.76E−03	1.65E−03	1.40E−03	9.34E−04	5.56E−04	3.95E−04	3.27E−04
135.00	3.61E−03	1.57E−03	1.33E−03	8.94E−04	5.37E−04	3.84E−04	3.18E−04
150.00	3.50E−03	1.52E−03	1.29E−03	8.68E−04	5.26E−04	3.79E−04	3.15E−04
165.00	3.44E−03	1.49E−03	1.27E−03	8.56E−04	5.22E−04	3.79E−04	3.17E−04
180.00	3.42E−03	1.48E−03	1.26E−03	8.53E−04	5.22E−04	3.80E−04	3.18E−04
total	2.59E+00	1.70E+00	1.57E+00	1.28E+00	9.65E−01	7.87E−01	7.03E−01
rel ff	—	—	—	—	—	—	—
nrl ff	—	—	—	—	—	—	—

TABLE 1. Predicted *S*-matrix differential elastic scattering cross sections for photon energies (50.0, 59.54, 145.4, 316.5, 411.8, 468.1, 661.6, 778.9, 964.0, 1004.8, 1112.1, 1274.5, 1408.0 and 1500.0). The angle integrated total cross sections for each element and energies are presented. ''total'' represents total cross sections from this work, ''rel ff'' represents total cross sections calculated from the relativistic form factor and ''nrl ff'' represents total cross sections calculated from the nonrelativistic form factor—Continued[a]

θ (deg)	Photon energy (keV)						
	50.0	59.5	145.4	316.5	411.8	468.1	661.6
Rutherfordiu ($Z=104$)							
0.00	8.39E+02	8.32E+02	8.03E+02	8.33E+02	8.31E+02	8.31E+02	8.30E+02
0.01	8.39E+02	8.32E+02	8.03E+02	8.33E+02	8.31E+02	8.31E+02	8.30E+02
0.02	8.39E+02	8.32E+02	8.03E+02	8.32E+02	8.30E+02	8.30E+02	8.29E+02
0.04	8.39E+02	8.32E+02	8.03E+02	8.32E+02	8.30E+02	8.29E+02	8.26E+02
0.06	8.39E+02	8.31E+02	8.03E+02	8.31E+02	8.28E+02	8.27E+02	8.21E+02
0.10	8.38E+02	8.31E+02	8.02E+02	8.27E+02	8.22E+02	8.19E+02	8.07E+02
0.20	8.38E+02	8.30E+02	7.98E+02	8.11E+02	7.97E+02	7.89E+02	7.55E+02
0.30	8.38E+02	8.30E+02	7.92E+02	7.89E+02	7.64E+02	7.49E+02	6.95E+02
0.40	8.37E+02	8.28E+02	7.85E+02	7.62E+02	7.27E+02	7.07E+02	6.32E+02
0.50	8.35E+02	8.26E+02	7.76E+02	7.34E+02	6.89E+02	6.62E+02	5.70E+02
0.60	8.34E+02	8.24E+02	7.66E+02	7.05E+02	6.49E+02	6.17E+02	5.11E+02
0.70	8.33E+02	8.22E+02	7.55E+02	6.75E+02	6.10E+02	5.73E+02	4.56E+02
0.80	8.31E+02	8.19E+02	7.43E+02	6.45E+02	5.72E+02	5.31E+02	4.06E+02
1.00	8.26E+02	8.12E+02	7.18E+02	5.85E+02	4.98E+02	4.53E+02	3.26E+02
1.20	8.21E+02	8.05E+02	6.92E+02	5.27E+02	4.32E+02	3.86E+02	2.65E+02
1.50	8.11E+02	7.92E+02	6.51E+02	4.48E+02	3.50E+02	3.06E+02	2.01E+02
1.70	8.03E+02	7.82E+02	6.24E+02	4.02E+02	3.07E+02	2.65E+02	1.71E+02
2.00	7.92E+02	7.67E+02	5.83E+02	3.43E+02	2.54E+02	2.17E+02	1.36E+02
2.50	7.72E+02	7.41E+02	5.17E+02	2.67E+02	1.92E+02	1.62E+02	9.79E+01
3.00	7.52E+02	7.14E+02	4.55E+02	2.14E+02	1.51E+02	1.25E+02	7.21E+01
3.50	7.32E+02	6.85E+02	4.00E+02	1.75E+02	1.21E+02	9.91E+01	5.34E+01
4.00	7.11E+02	6.57E+02	3.52E+02	1.45E+02	9.87E+01	7.92E+01	3.96E+01
5.00	6.66E+02	5.99E+02	2.76E+02	1.05E+02	6.75E+01	5.19E+01	2.26E+01
6.00	6.18E+02	5.44E+02	2.21E+02	7.73E+01	4.65E+01	3.48E+01	1.47E+01
7.00	5.67E+02	4.91E+02	1.80E+02	5.78E+01	3.21E+01	2.40E+01	1.09E+01
8.00	5.17E+02	4.42E+02	1.50E+02	4.37E+01	2.28E+01	1.72E+01	8.52E+00
9.00	4.69E+02	3.98E+02	1.26E+02	3.34E+01	1.71E+01	1.29E+01	6.55E+00
10.00	4.25E+02	3.59E+02	1.07E+02	2.60E+01	1.37E+01	1.03E+01	4.92E+00
12.50	3.34E+02	2.80E+02	7.40E+01	1.51E+01	8.97E+00	6.50E+00	2.40E+00
15.00	2.72E+02	2.23E+02	5.18E+01	9.99E+00	5.93E+00	4.20E+00	1.42E+00
17.50	2.30E+02	1.82E+02	3.62E+01	7.17E+00	3.74E+00	2.65E+00	1.02E+00
20.00	1.98E+02	1.50E+02	2.53E+01	5.26E+00	2.40E+00	1.71E+00	7.70E−01
22.50	1.71E+02	1.26E+02	1.81E+01	3.86E+00	1.67E+00	1.20E+00	5.67E−01
25.00	1.48E+02	1.06E+02	1.34E+01	2.84E+00	1.27E+00	9.10E−01	4.03E−01
27.50	1.27E+02	9.04E+01	1.05E+01	2.11E+00	1.03E+00	7.30E−01	2.82E−01
30.00	1.09E+02	7.73E+01	8.50E+00	1.61E+00	8.53E−01	5.96E−01	1.97E−01
35.00	8.01E+01	5.68E+01	5.95E+00	1.02E+00	5.84E−01	3.92E−01	1.02E−01
40.00	5.96E+01	4.17E+01	4.19E+00	7.20E−01	3.81E−01	2.47E−01	6.01E−02
45.00	4.48E+01	3.06E+01	2.86E+00	5.31E−01	2.43E−01	1.54E−01	4.00E−02
50.00	3.41E+01	2.26E+01	1.91E+00	3.95E−01	1.57E−01	9.87E−02	2.89E−02
55.00	2.64E+01	1.70E+01	1.30E+00	2.93E−01	1.05E−01	6.65E−02	2.21E−02
60.00	2.07E+01	1.31E+01	9.18E−01	2.19E−01	7.45E−02	4.77E−02	1.76E−02
65.00	1.67E+01	1.04E+01	6.88E−01	1.66E−01	5.62E−02	3.66E−02	1.44E−02
70.00	1.38E+01	8.53E+00	5.48E−01	1.30E−01	4.51E−02	2.98E−02	1.22E−02
75.00	1.16E+01	7.24E+00	4.61E−01	1.04E−01	3.82E−02	2.56E−02	1.06E−02
80.00	1.01E+01	6.33E+00	4.05E−01	8.70E−02	3.39E−02	2.30E−02	9.50E−03
85.00	9.01E+00	5.69E+00	3.68E−01	7.56E−02	3.12E−02	2.14E−02	8.75E−03
90.00	8.23E+00	5.23E+00	3.43E−01	6.80E−02	2.96E−02	2.05E−02	8.23E−03
95.00	7.69E+00	4.91E+00	3.26E−01	6.32E−02	2.87E−02	2.00E−02	7.88E−03
105.00	7.10E+00	4.56E+00	3.06E−01	5.86E−02	2.81E−02	1.97E−02	7.45E−03
120.00	6.92E+00	4.42E+00	2.91E−01	5.79E−02	2.88E−02	2.01E−02	7.14E−03
135.00	7.10E+00	4.48E+00	2.84E−01	6.00E−02	2.98E−02	2.06E−02	6.96E−03
150.00	7.34E+00	4.59E+00	2.78E−01	6.23E−02	3.07E−02	2.10E−02	6.83E−03
165.00	7.53E+00	4.66E+00	2.75E−01	6.40E−02	3.12E−02	2.12E−02	6.75E−03
180.00	7.59E+00	4.69E+00	2.74E−01	6.45E−02	3.13E−02	2.13E−02	6.72E−03
total	3.95E+02	2.90E+02	5.40E+01	1.55E+01	9.35E+00	7.27E+00	3.69E+00
rel ff	—	—	—	—	—	—	—
nrl ff	—	—	—	—	—	—	—

TABLE 1. Predicted *S*-matrix differential elastic scattering cross sections for photon energies (50.0, 59.54, 145.4, 316.5, 411.8, 468.1, 661.6, 778.9, 964.0, 1004.8, 1112.1, 1274.5, 1408.0 and 1500.0). The angle integrated total cross sections for each element and energies are presented. ''total'' represents total cross sections from this work, ''rel ff'' represents total cross sections calculated from the relativistic form factor and ''nrl ff'' represents total cross sections calculated from the nonrelativistic form factor—Continued[a]

θ (deg)	Photon energy (keV)						
	778.9	964.0	1004.8	1112.1	1274.5	1408.0	1500.0
Rutherfordiu ($Z=104$)							
0.00	8.30E+02	8.30E+02	8.30E+02	8.29E+02	8.29E+02	8.28E+02	8.27E+02
0.01	8.29E+02	8.29E+02	8.28E+02	8.28E+02	8.27E+02	8.27E+02	8.26E+02
0.02	8.29E+02	8.27E+02	8.27E+02	8.26E+02	8.25E+02	8.23E+02	8.22E+02
0.04	8.24E+02	8.21E+02	8.20E+02	8.18E+02	8.14E+02	8.10E+02	8.08E+02
0.06	8.18E+02	8.11E+02	8.09E+02	8.05E+02	7.98E+02	7.92E+02	7.88E+02
0.10	7.99E+02	7.84E+02	7.81E+02	7.72E+02	7.57E+02	7.45E+02	7.37E+02
0.20	7.34E+02	6.99E+02	6.92E+02	6.71E+02	6.39E+02	6.13E+02	5.95E+02
0.30	6.61E+02	6.08E+02	5.96E+02	5.66E+02	5.21E+02	4.87E+02	4.64E+02
0.40	5.87E+02	5.20E+02	5.06E+02	4.69E+02	4.19E+02	3.81E+02	3.58E+02
0.50	5.17E+02	4.40E+02	4.25E+02	3.87E+02	3.37E+02	3.03E+02	2.83E+02
0.60	4.52E+02	3.73E+02	3.57E+02	3.21E+02	2.75E+02	2.46E+02	2.30E+02
0.70	3.96E+02	3.17E+02	3.03E+02	2.69E+02	2.28E+02	2.03E+02	1.90E+02
0.80	3.47E+02	2.73E+02	2.59E+02	2.29E+02	1.92E+02	1.71E+02	1.59E+02
1.00	2.71E+02	2.08E+02	1.97E+02	1.72E+02	1.42E+02	1.25E+02	1.15E+02
1.20	2.17E+02	1.64E+02	1.55E+02	1.34E+02	1.10E+02	9.40E+01	8.49E+01
1.50	1.62E+02	1.20E+02	1.12E+02	9.61E+01	7.65E+01	6.34E+01	5.55E+01
1.70	1.36E+02	9.90E+01	9.27E+01	7.83E+01	6.08E+01	4.88E+01	4.15E+01
2.00	1.07E+02	7.58E+01	7.04E+01	5.82E+01	4.31E+01	3.29E+01	2.68E+01
2.50	7.41E+01	4.92E+01	4.50E+01	3.57E+01	2.50E+01	1.82E+01	1.45E+01
3.00	5.19E+01	3.19E+01	2.89E+01	2.24E+01	1.59E+01	1.25E+01	1.09E+01
3.50	3.66E+01	2.13E+01	1.91E+01	1.49E+01	1.13E+01	1.01E+01	1.01E+01
4.00	2.65E+01	1.52E+01	1.37E+01	1.08E+01	8.60E+00	8.14E+00	8.52E+00
5.00	1.56E+01	9.91E+00	9.09E+00	7.33E+00	5.33E+00	3.98E+00	3.16E+00
6.00	1.06E+01	7.19E+00	6.63E+00	5.24E+00	3.27E+00	1.83E+00	1.07E+00
7.00	7.71E+00	4.86E+00	4.40E+00	3.35E+00	2.03E+00	1.17E+00	7.21E−01
8.00	5.62E+00	3.10E+00	2.75E+00	2.03E+00	1.35E+00	1.01E+00	8.39E−01
9.00	4.07E+00	2.03E+00	1.78E+00	1.31E+00	9.76E−01	9.38E−01	1.04E+00
10.00	2.97E+00	1.45E+00	1.27E+00	9.47E−01	7.53E−01	8.00E−01	9.79E−01
12.50	1.55E+00	9.15E−01	8.28E−01	6.48E−01	4.50E−01	3.21E−01	2.44E−01
15.00	9.86E−01	6.53E−01	5.98E−01	4.60E−01	2.56E−01	1.18E−01	5.62E−02
17.50	6.88E−01	4.09E−01	3.65E−01	2.62E−01	1.35E−01	6.25E−02	3.11E−02
20.00	4.79E−01	2.37E−01	2.04E−01	1.38E−01	7.53E−02	4.48E−02	3.07E−02
22.50	3.26E−01	1.39E−01	1.17E−01	7.68E−02	4.67E−02	3.68E−02	3.49E−02
25.00	2.19E−01	8.75E−02	7.30E−02	4.82E−02	3.23E−02	3.06E−02	3.53E−02
27.50	1.49E−01	6.00E−02	5.04E−02	3.42E−02	2.41E−02	2.41E−02	2.87E−02
30.00	1.05E−01	4.46E−02	3.81E−02	2.67E−02	1.91E−02	1.79E−02	1.94E−02
35.00	5.74E−02	2.89E−02	2.55E−02	1.89E−02	1.25E−02	8.72E−03	6.58E−03
40.00	3.60E−02	2.05E−02	1.85E−02	1.39E−02	8.20E−03	4.32E−03	2.36E−03
45.00	2.48E−02	1.47E−02	1.32E−02	9.83E−03	5.29E−03	2.39E−03	1.11E−03
50.00	1.81E−02	1.04E−02	9.26E−03	6.66E−03	3.39E−03	1.47E−03	6.74E−04
55.00	1.37E−02	7.46E−03	6.55E−03	4.56E−03	2.27E−03	1.02E−03	5.00E−04
60.00	1.07E−02	5.50E−03	4.77E−03	3.24E−03	1.64E−03	8.04E−04	4.39E−04
65.00	8.64E−03	4.23E−03	3.63E−03	2.43E−03	1.26E−03	6.76E−04	4.12E−04
70.00	7.21E−03	3.41E−03	2.91E−03	1.94E−03	1.04E−03	6.07E−04	4.07E−04
75.00	6.23E−03	2.89E−03	2.46E−03	1.64E−03	9.07E−04	5.65E−04	4.08E−04
80.00	5.55E−03	2.55E−03	2.17E−03	1.45E−03	8.20E−04	5.34E−04	4.04E−04
85.00	5.09E−03	2.32E−03	1.98E−03	1.32E−03	7.62E−04	5.10E−04	3.98E−04
90.00	4.77E−03	2.17E−03	1.85E−03	1.24E−03	7.21E−04	4.92E−04	3.92E−04
95.00	4.54E−03	2.05E−03	1.75E−03	1.17E−03	6.89E−04	4.76E−04	3.83E−04
105.00	4.25E−03	1.91E−03	1.62E−03	1.09E−03	6.45E−04	4.51E−04	3.67E−04
120.00	4.00E−03	1.77E−03	1.50E−03	1.01E−03	6.03E−04	4.27E−04	3.51E−04
135.00	3.84E−03	1.69E−03	1.44E−03	9.67E−04	5.81E−04	4.14E−04	3.42E−04
150.00	3.74E−03	1.63E−03	1.39E−03	9.39E−04	5.69E−04	4.08E−04	3.38E−04
165.00	3.67E−03	1.60E−03	1.37E−03	9.26E−04	5.65E−04	4.08E−04	3.39E−04
180.00	3.65E−03	1.60E−03	1.36E−03	9.23E−04	5.65E−04	4.09E−04	3.41E−04
total	2.66E+00	1.75E+00	1.61E+00	1.31E+00	9.92E−01	8.09E−01	7.23E−01
rel ff	—	—	—	—	—	—	—
nrl ff	—	—	—	—	—	—	—

[a]$d\sigma/d\Omega$ (barns/sr) predicted from relativistic *S*-matrix calculation.

TABLE 2. Number of available experimental data points of differential cross sections for each element at different photon energies.

Z	59.54	81	84.26	88.03	122.1	136.5	145.4	244.7	279.2	316.5
13	8	4	0	2	0	0	0	0	0	0
23	3	0	0	0	0	0	0	0	0	0
28	0	4	0	0	0	0	0	0	0	0
29	7	0	1	0	0	0	8	6	4	8
30	12	0	0	0	0	0	0	0	4	0
36	11	0	0	0	0	0	0	0	0	0
40	0	0	4	0	0	0	5	0	0	0
41	2	0	0	0	0	0	0	0	0	0
42	16	0	1	0	0	0	0	0	4	7
47	1	0	1	0	0	0	0	0	0	10
48	11	0	1	0	0	0	12	6	0	9
50	12	0	5	0	0	0	5	0	18	9
54	11	0	0	0	0	0	0	0	0	0
59	1	0	1	0	0	0	0	0	0	0
62	1	0	1	0	0	0	0	0	0	0
64	4	0	1	0	0	0	0	0	0	0
66	4	0	1	0	0	0	0	0	0	0
67	1	0	1	0	0	0	0	0	0	0
68	8	0	0	0	0	0	0	0	0	0
70	7	0	1	0	0	0	0	0	0	0
72	3	0	0	0	0	0	0	0	0	0
73	15	4	5	0	0	0	5	6	4	0
74	1	0	1	0	0	0	4	0	0	10
79	8	4	9	2	0	0	0	0	0	0
82	18	4	1	2	5	14	27	6	23	10
83	0	0	0	2	0	0	0	0	0	0
90	1	0	1	0	0	0	0	0	0	0
92	1	0	1	0	0	0	8	0	9	0

Z	344.3	411.8	443.9	468.1	661.6	723.3	778.9	867.4	889.3
29	11	6	12	8	6	5	12	6	0
30	0	0	0	0	5	0	0	0	0
42	8	8	8	8	4	7	8	7	0
47	0	10	0	15	5	0	0	0	0
48	6	9	6	9	10	0	6	0	0
50	9	9	9	9	24	7	8	7	0
56	0	6	0	0	0	0	0	0	0
73	15	9	15	0	4	8	15	7	0
74	6	9	6	14	6	0	6	0	0
78	0	13	0	6	13	0	0	0	0
80	0	0	0	0	1	0	0	0	1
82	25	18	15	10	32	9	22	7	10
92	9	19	9	0	23	9	9	7	10

Z	964	1004.8	1085.8	1112.1	1120.5	1173.2	1274.5	1332.5	1408
29	12	5	9	11	0	6	9	6	12
42	8	6	8	8	0	0	7	5	8
48	6	0	4	6	0	0	5	0	6
50	8	6	8	8	0	7	8	7	8
73	15	6	13	15	0	0	13	5	15
74	6	0	6	6	0	0	0	0	6
80	0	0	0	0	1	0	0	0	0
82	23	8	21	23	10	20	14	31	25
92	9	5	9	9	10	10	8	21	9

clude Rayleigh, nuclear Thomson, and Delbruck amplitudes for all energies, elements, and scattering angles.

Since Rayleigh scattering is predominant for the present work, it is important to understand how accurate the different calculations are in estimating the Rayleigh amplitudes.

2.2. Form Factor Approximations

The scattering of an electromagnetic radiation of frequency (ω) by a free electron was first calculated by Thomson [8] using classical electrodynamics. The Thomson differ-

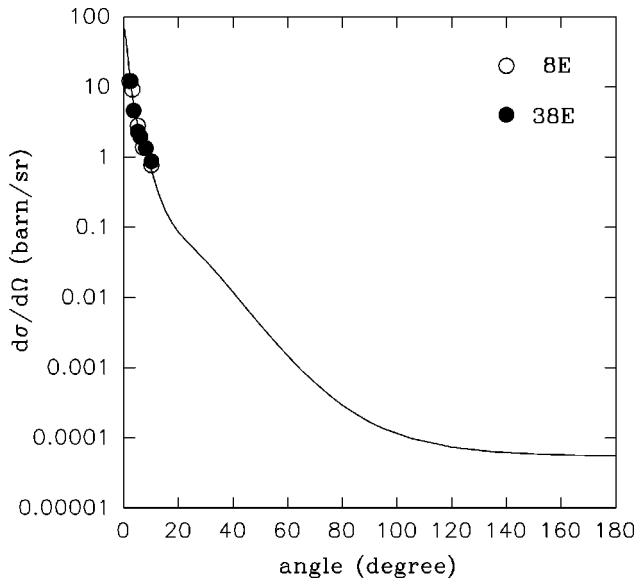

FIG. 4. Comparison of experimental results with the predicted cross sections for copper at 344.3 keV.

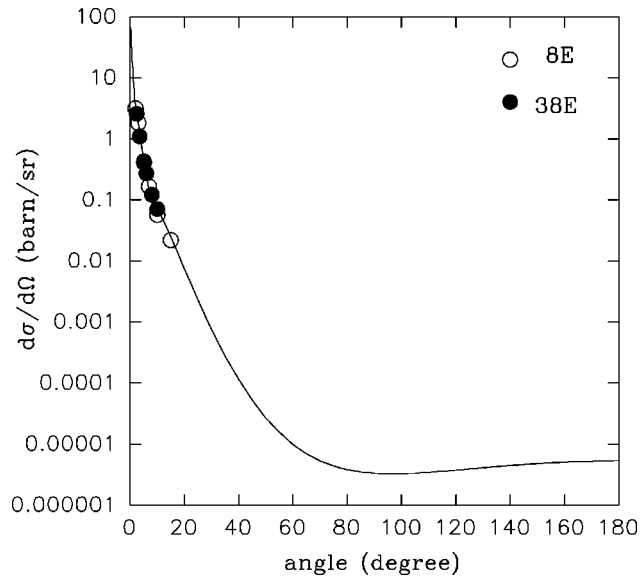

FIG. 6. Comparison of experimental results with the predicted cross sections for copper at 778.9 keV.

ential cross section for scattering of unpolarized radiation by a classical free electron is

$$\frac{d\sigma_T}{d\Omega}=\frac{1}{2}r_0^2(1+\cos^2\theta). \tag{2}$$

Historically, the form factor was developed as a correction factor to the Thomson formula considering the scattering of an extended electronic charge distribution instead of classical point charge as assumed by Thomson. In other words, we can interpret the atomic form factor as characterizing the effective charge that scatters the photon. The atomic form factor may be expressed as the integral

$$f(q)=4\pi\int \rho(r)\sin(qr)r^2\mathrm{d}r, \tag{3}$$

where $\rho(r)$ is the electron number distribution of the atom assumed spherically symmetric and normalized to Z and

$$\hbar q=2\frac{\hbar\omega}{c}\sin\left(\frac{\theta}{2}\right) \tag{4}$$

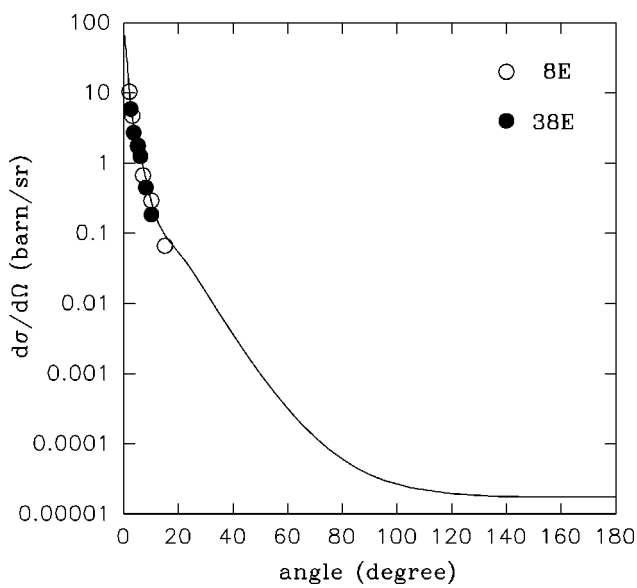

FIG. 5. Comparison of experimental results with the predicted cross sections for copper at 444.0 keV.

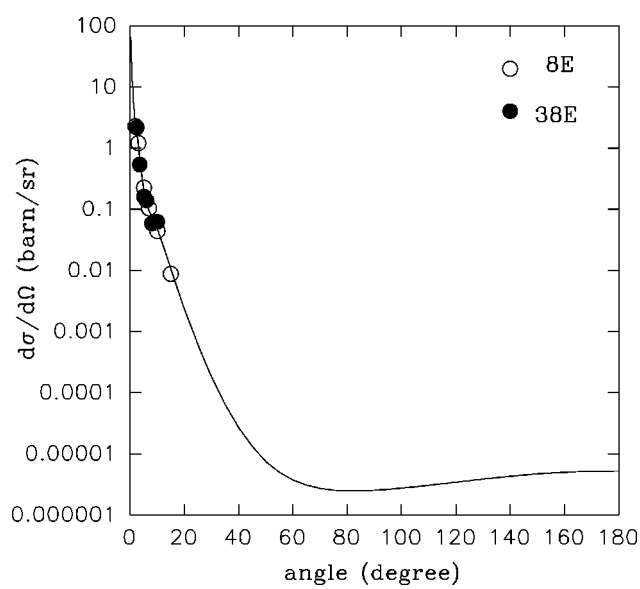

FIG. 7. Comparison of experimental results with the predicted cross sections for copper at 964.0 keV.

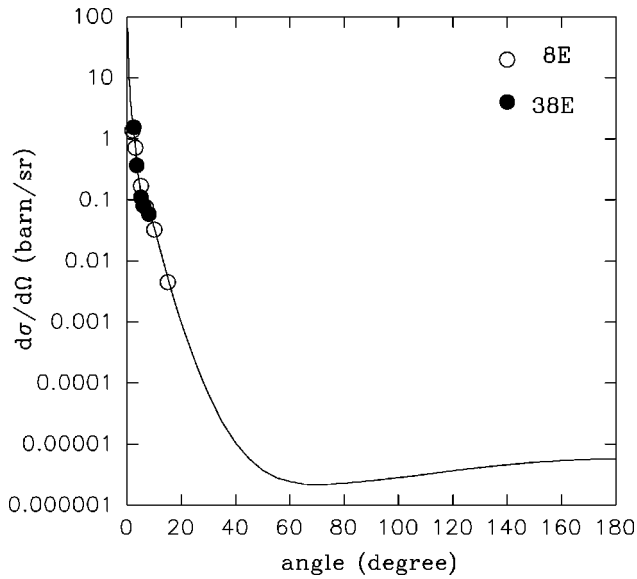

FIG. 8. Comparison of experimental results with the predicted cross sections for copper at 1112.1 keV.

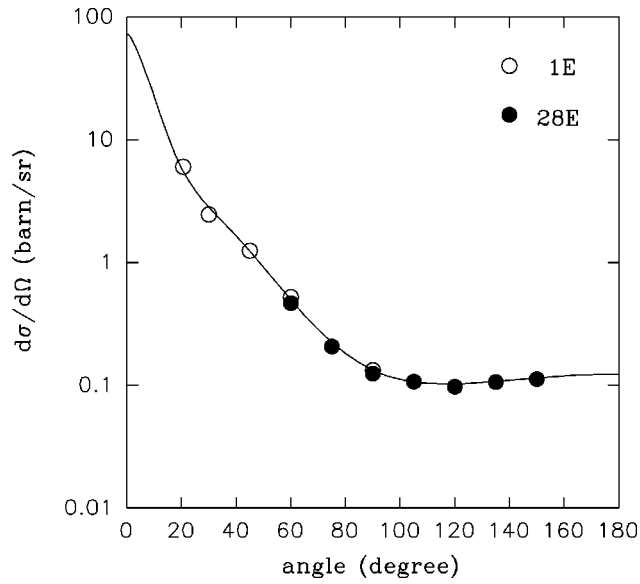

FIG. 10. Comparison of experimental results with the predicted cross sections for zinc at 59.54 keV.

is the momentum transferred to the atom as the photon is scattered through an angle θ. Another popular unit for expressing momentum transfer is in Å^{-1}, where traditionally the form factor is defined as $f(x)$ instead of $f(q)$ and $x = \lambda^{-1}\sin(\theta/2)$. The momentum transfer hq in the units of mc can be transformed into units of Å^{-1} by multiplying hq by 20.607 44. The scattering cross section for the unpolarized photon is obtained by multiplying the Thomson cross section by the square of the form factor and is given by

$$\frac{d\sigma_T}{d\Omega} = \frac{1}{2} r_0^2 (1+\cos^2\theta)|f(q)|^2. \tag{5}$$

The atomic form factor is usually obtained by evaluating the above integral [Eq. (3)], while the charge density $\rho(r)$ is derived from the atomic ground state wave functions using the following form

$$\rho(r) = \sum_{n=1}^{Z} |\psi_n(r)|^2, \tag{6}$$

where ψ is a single electron wave function. So far all calculations have been done in the independent particle approximation (IPA) model where it has been assumed that all atomic electrons move independently in a central potential due to the nucleus and the average field of other electrons.

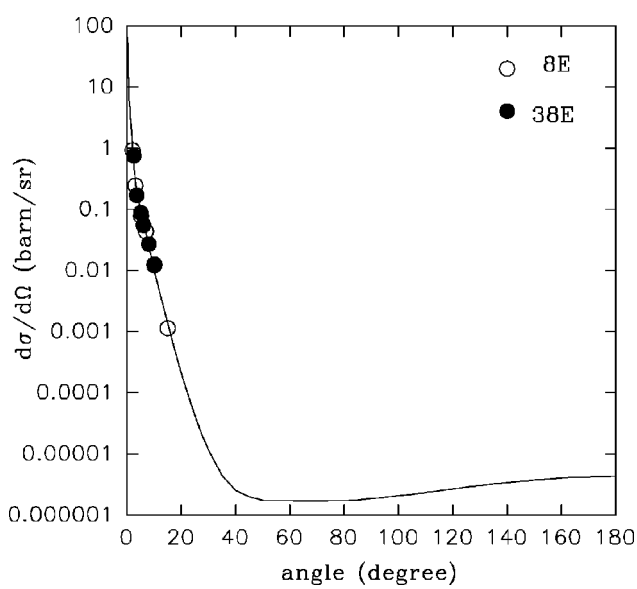

FIG. 9. Comparison of experimental results with the predicted cross sections for copper at 1408.0 keV.

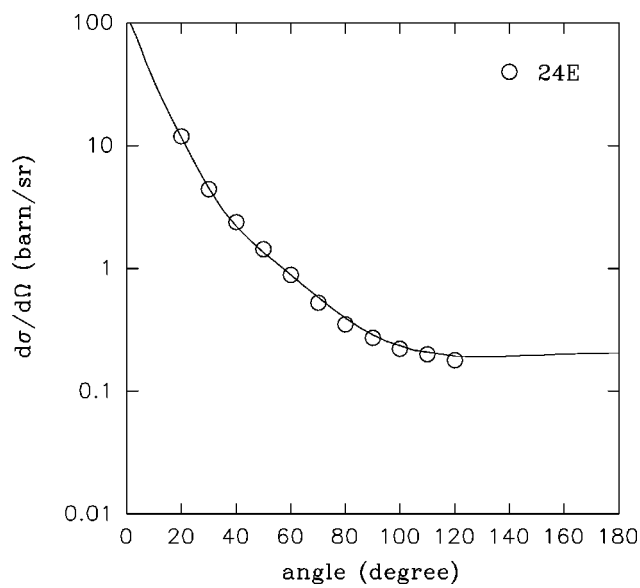

FIG. 11. Comparison of experimental results with the predicted cross sections for krypton at 59.54 keV.

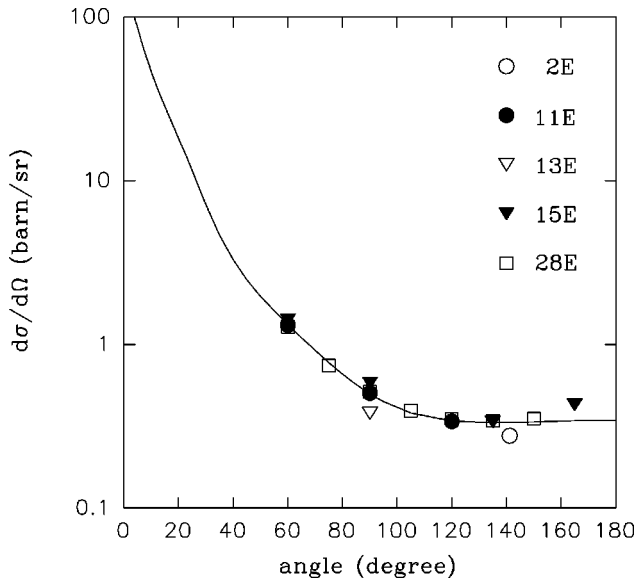

FIG. 12. Comparison of experimental results with the predicted cross sections for molybdenum at 59.54 keV.

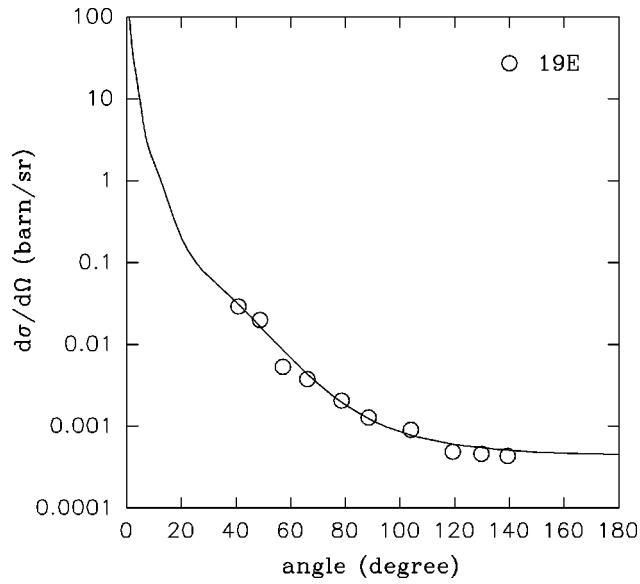

FIG. 14. Comparison of experimental results with the predicted cross sections for silver at 411.8 keV.

IPA works well except at very low energies and light atoms for which electron correlation could not be neglected. If the atomic charge distribution is derived using the nonrelativistic ground state wave function, the form factor derived from such a charge distribution is known as the nonrelativistic form factor. If the relativistic wave function is used to derive atomic charge distribution, the form factor derived using such charge distribution is known as the relativistic form factor.

In the form factors described above, the electron binding energy has been neglected. Franz in 1936[9] suggested an electron binding correction to the form factor, and the resulting corrected form factor is commonly known as the modified form factor (MFF) and is represented by $g(q)$ to differentiate it from the ordinary form factor $f(q)$. The MFF $g(q)$ for a given electron is given by

$$g_n(q)=4\pi\int \rho_n(r)\frac{\sin(qr)}{qr}\left(\frac{mc^2}{E_n-V(r)}\right)r^2\,\mathrm{d}r \qquad (7)$$

where E_n is the total energy of the nth electron ($E_n=mc^2-\epsilon_n$, ϵ_n is the electron binding energy), $V(r)$ is the atomic potential, and $\rho_n(r)$ is the charge distribution associated with the nth electron. Unlike $f(q)$, owing to the presence of the term ϵ_n, $g(q)$ cannot be calculated directly from the total

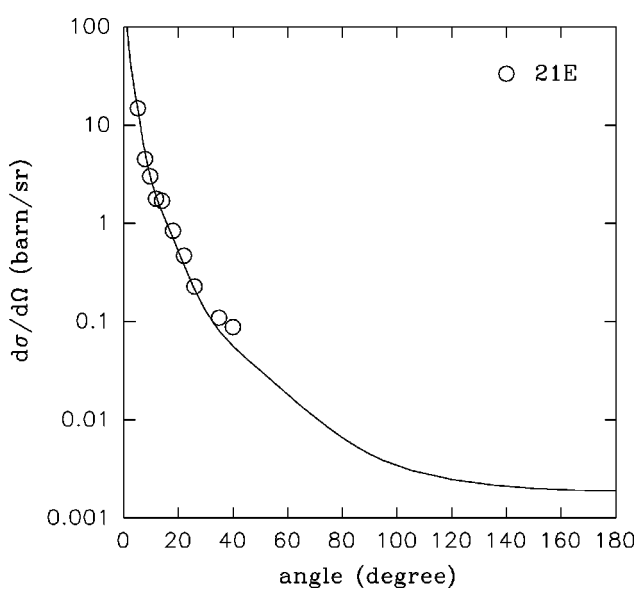

FIG. 13. Comparison of experimental results with the predicted cross sections for silver at 316.5 keV.

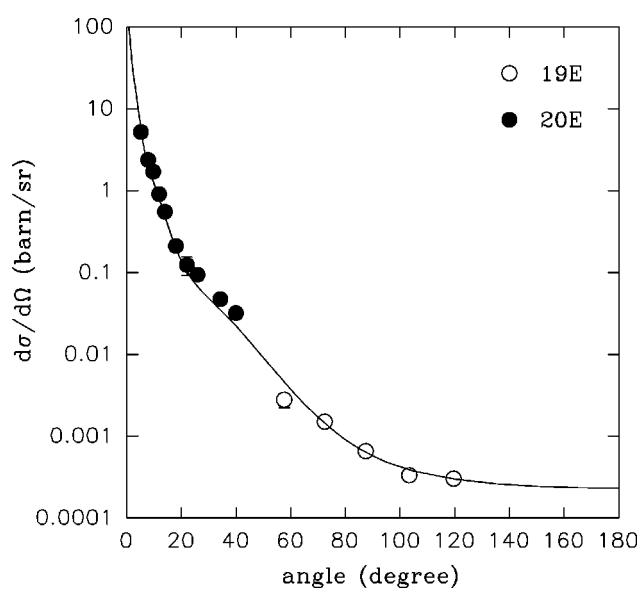

FIG. 15. Comparison of experimental results with the predicted cross sections for silver at 468.1 keV.

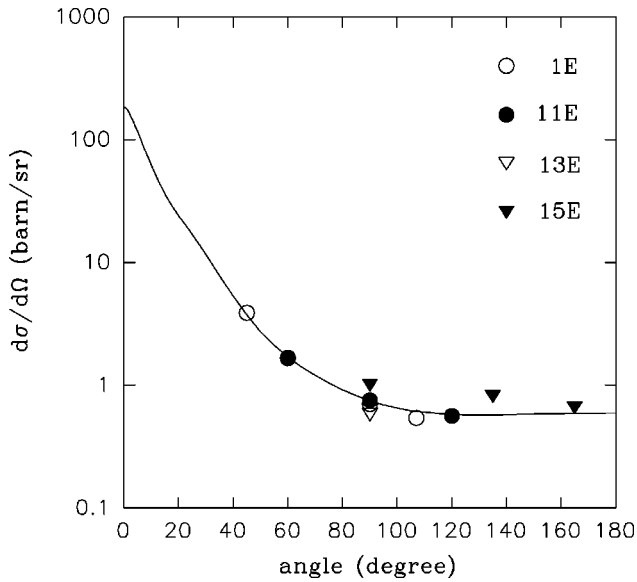

FIG. 16. Comparison of experimental results with the predicted cross sections for cadmium at 59.54 keV.

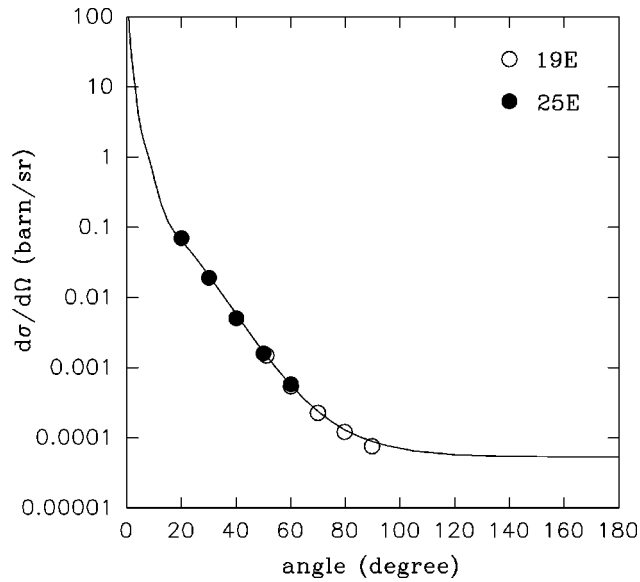

FIG. 18. Comparison of experimental results with the predicted cross sections for cadmium at 661.6 keV.

atom charge distribution. Instead, contributions from electrons of each subshell must be calculated separately and summed. In other words, the total atom MFF $g(q)$ should be

$$g(q)=\sum_n g_n(q)$$
$$=4\pi\sum_n \int \rho_n(r)\frac{\sin(qr)}{qr}\left(\frac{mc^2}{E_n-V(r)}\right)r^2\,\mathrm{d}r. \quad (8)$$

The corresponding cross section for the unpolarized photon is given by

$$\frac{\mathrm{d}\sigma}{\mathrm{d}\Omega}=\frac{1}{2}r_0^2(1+\cos^2\theta)|g(q)|^2. \quad (9)$$

Tabulated values of nonrelativistic[1] and relativistic $f(q)$s[2] and relativistic $g(q)$s[3] are available for all elements of the periodic table up to $Z=100$, covering a wide range of momentum transfers.

Since the basic assumption needed to derive the form factor is that photon energy is large compared with the binding energies of electrons that scatter (commonly referred to as high energy approximation), a form factor approximation is expected to give good predictions of cross sections for pho-

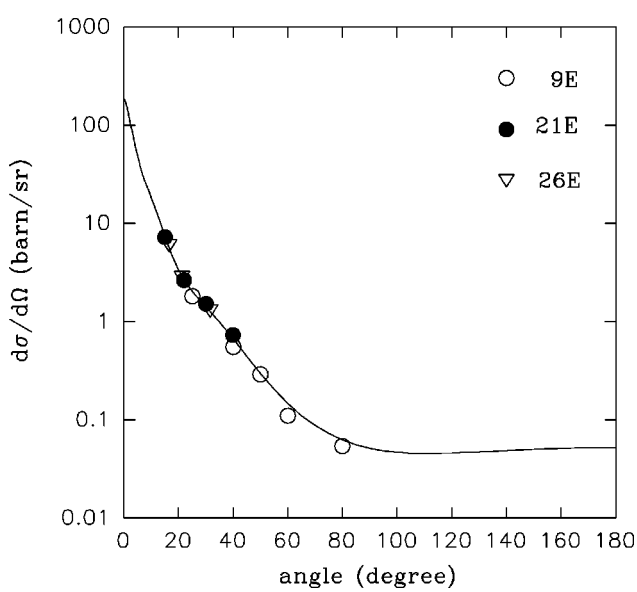

FIG. 17. Comparison of experimental results with the predicted cross sections for cadmium at 145.4 keV.

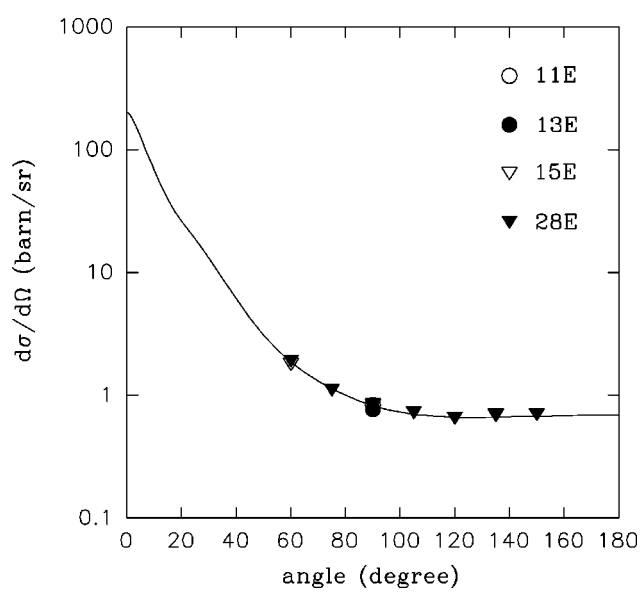

FIG. 19. Comparison of experimental results with the predicted cross sections for tin at 59.54 keV.

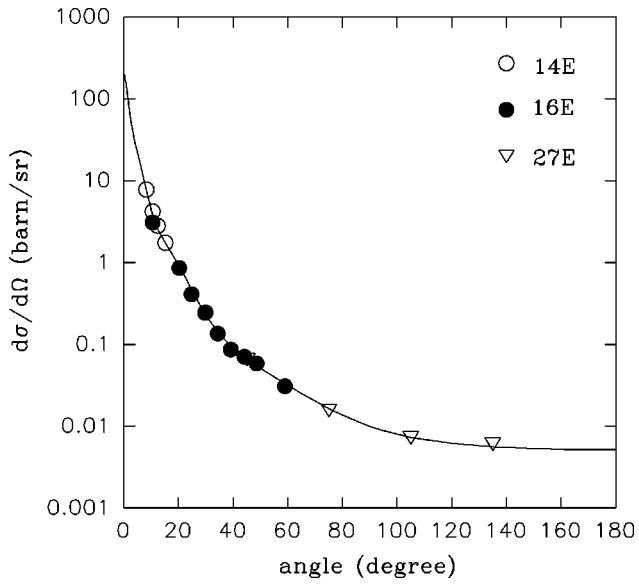

FIG. 20. Comparison of experimental results with the predicted cross sections for tin at 279.2 keV.

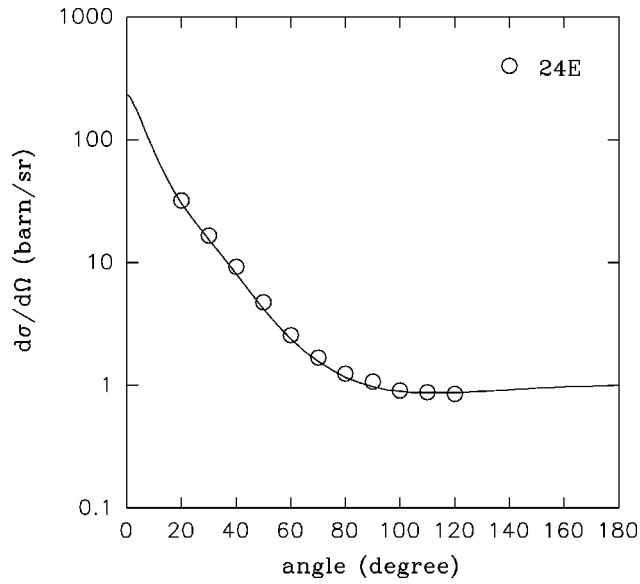

FIG. 22. Comparison of experimental results with the predicted cross sections for xenon at 59.54 keV.

ton energies above the *K*-shell binding energy. General comparisons of nonrelativistic, relativistic, and modified form factor with the experimental results have been extensively done by Roy *et al.*[10,11] and Kane *et al.*[5] It has been found that, in general, modified form factors agree better with experimental results compared to ordinary form factors. However, contrary to common notion, the nonrelativistic form factor gives better prediction compared to the corresponding relativistic form factor. The reason, as explained in Ref. 10, is substantial cancellation among relativistic, retardation, and higher multipole effects, so that the inclusion of relativistic effects without considering other effects makes the prediction worse. The modified form factor is found to be in good agreement with experimental results for all elements up to momentum transfer $x \leqslant 10\ \text{Å}^{-1}$ except for photon energies below or very close to *K* threshold.

To remedy the failure of the form factor (including the modified form factor) at low photon energies, an anomalous scattering factor (ASF), defined as the deviation of the exact forward scattering amplitude from FF or MFF, is often included. ASF has been obtained utilizing the dispersion relation between real and imaginary parts of the forward scattering amplitude and the optical theorem relating the imaginary part to the photon absorption cross section. Readers are re-

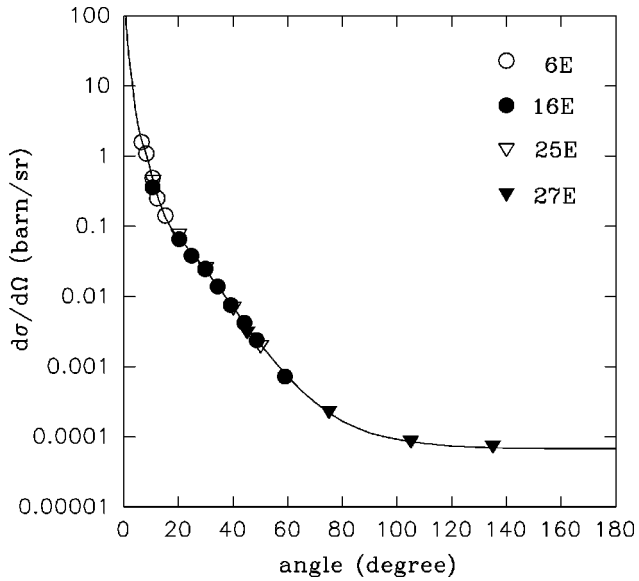

FIG. 21. Comparison of experimental results with the predicted cross sections for tin at 661.6 keV.

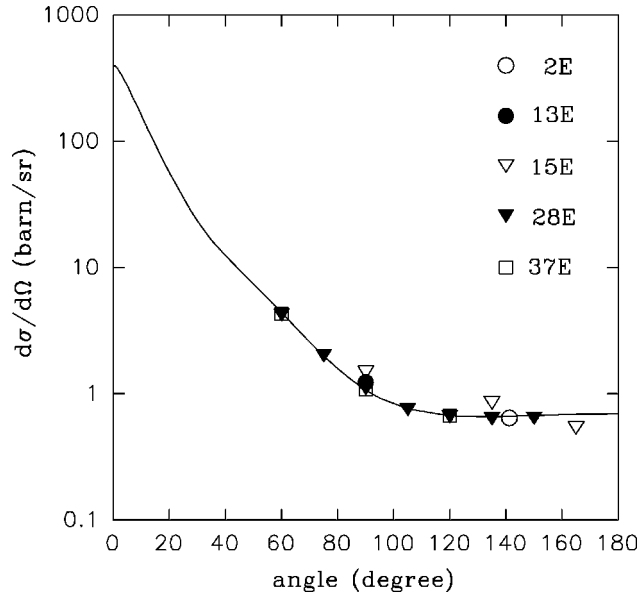

FIG. 23. Comparison of experimental results with the predicted cross sections for tantalum at 59.54 keV.

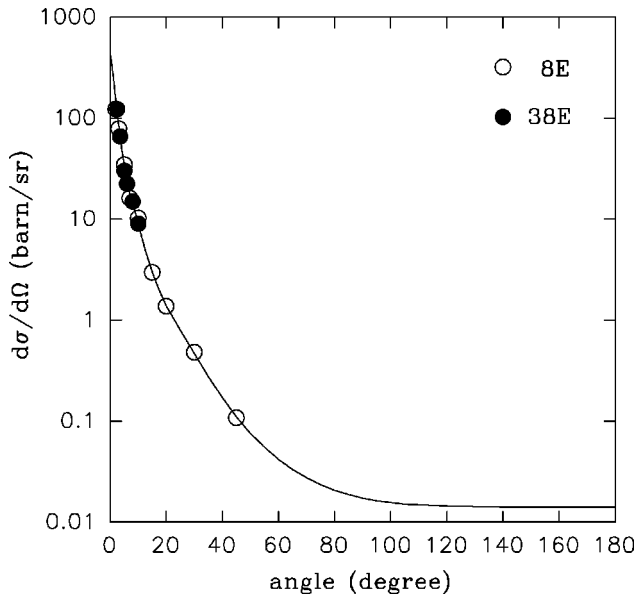

FIG. 24. Comparison of experimental results with the predicted cross sections for tantalum at 344.3 keV.

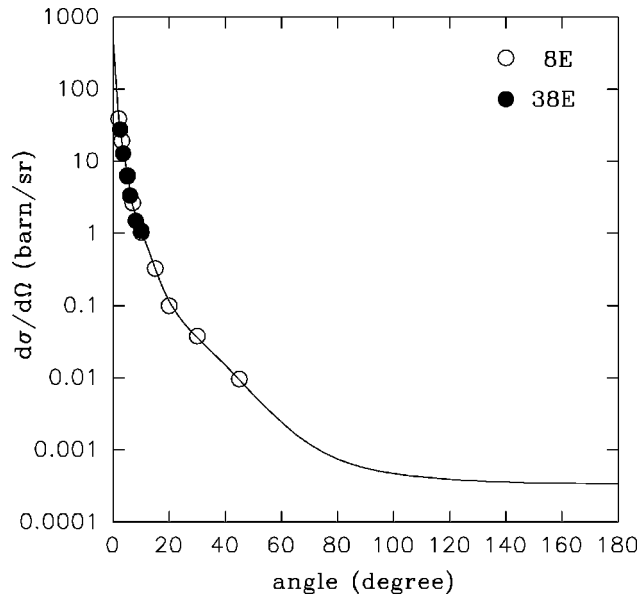

FIG. 26. Comparison of experimental results with the predicted cross sections for tantalum at 778.9 keV.

ferred to the publication of Kissel *et al.*[12] for a detailed discussion on the derivation of ASF, its validity, etc. All ASF calculations are for forward angle, and there exists no general scheme to extend them for other angles. It has been found that, in general, MFF with angle independent ASF, improves the agreement with experiments for all angles at photon energies near and below K threshold. Comparison of experimental results with different form factor approximations are shown in Figs. 1–3. Deviations of experimental results from the values predicted using MFF plus angle independent ASF at large momentum transfer indicate that it is essential to understand the variation of ASF at large angles.

2.3. *S*-matrix calculation

The scattering matrix (commonly called the S matrix) is an operator which connects the final state of a time-dependent system with that of the initial state. For Rayleigh scattering, the matrix element $S=\langle f|S|i\rangle$ represents the amplitude of a

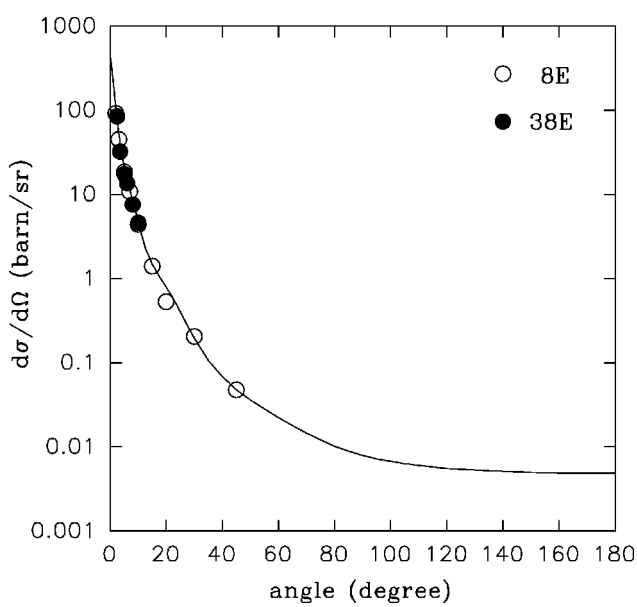

FIG. 25. Comparison of experimental results with the predicted cross sections for tantalum at 444.0 keV.

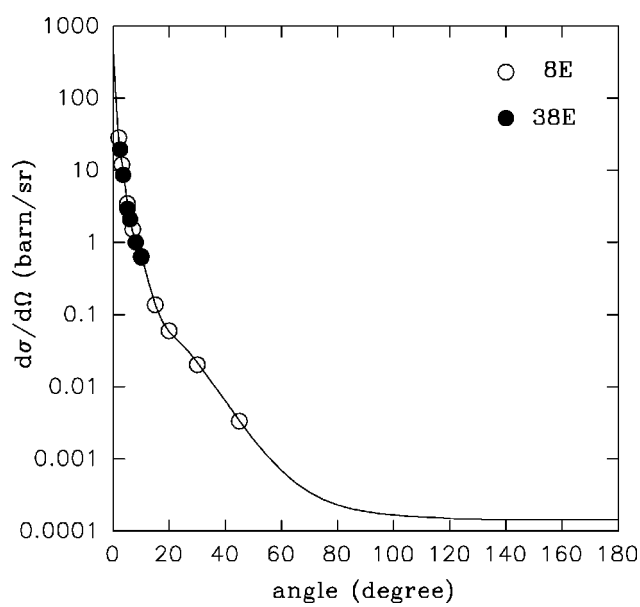

FIG. 27. Comparison of experimental results with the predicted cross sections for tantalum at 964.0 keV.

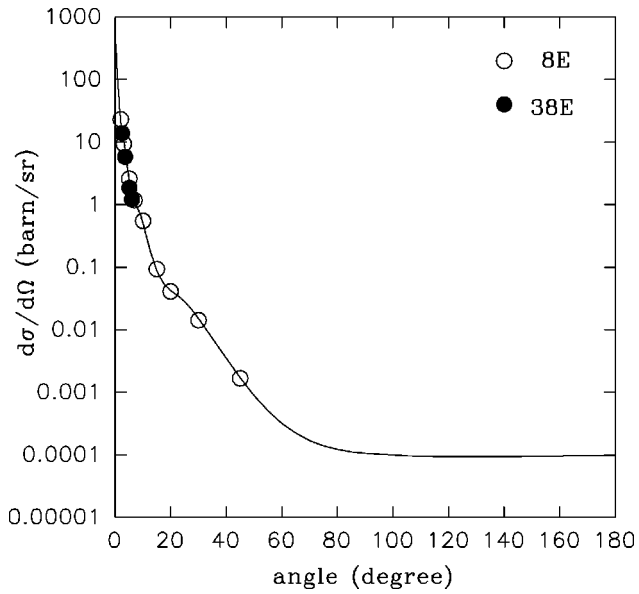

FIG. 28. Comparison of experimental results with the predicted cross sections for tantalum at 1085.8 keV.

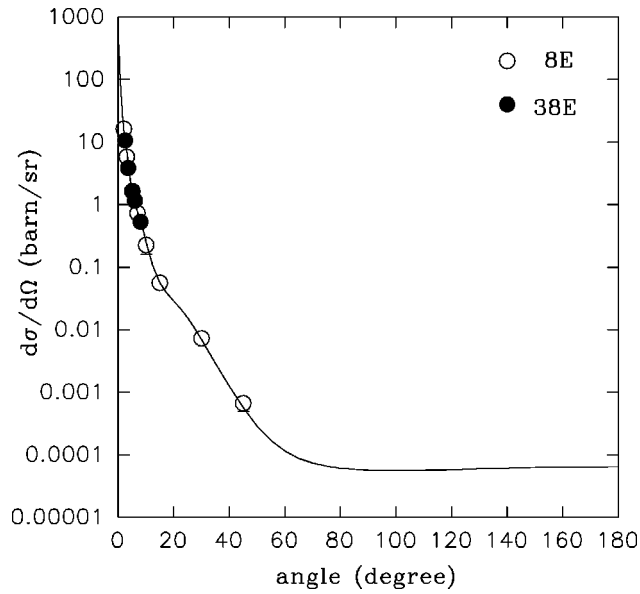

FIG. 30. Comparison of experimental results with the predicted cross sections for tantalum at 1274.5 keV.

specific stationary state $|f\rangle$ that evolved through scattering from the initial state $|i\rangle$. Such a scattering calculation usually starts with the atomic potential obtained in the independent particle approximations. The calculation starts with the well known Feynman–Dyson representation of scattering in second order. The effect of binding in the intermediate state is important and was explored analytically in the relativistic theory of Brown and Woodward[13]. This calculation was done in Born approximation. The realization that higher order Born correction terms are important in calculating the Rayleigh scattering amplitude led to the development of numerical partial wave methods.[14] Brown and co-workers[15,16] applied the numerical method to the elastic scattering of 0.32, 0.64, 1.28 and 2.56 mc^2 ($mc^2=511$ keV) from the K shell of mercury ($Z=80$). The atomic potential assumed in these calculations was a point Coulomb potential. Later Cornille and Chapdelaine[17] extended the above calculation for 2.62 MeV. These calculations are very lengthy and the com-

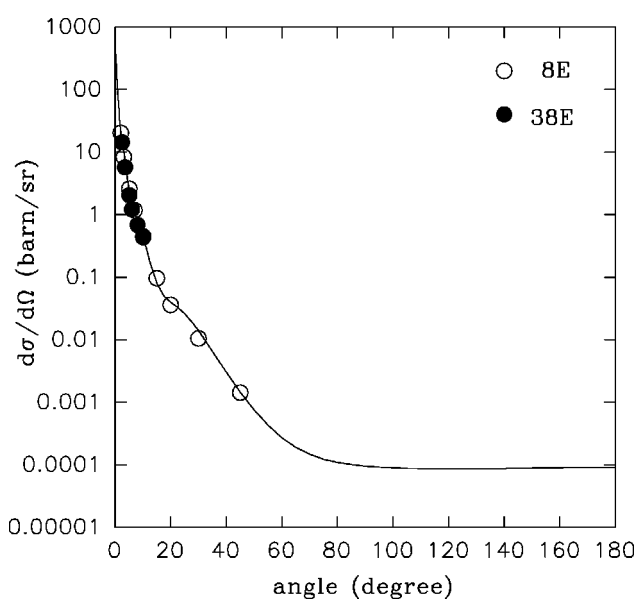

FIG. 29. Comparison of experimental results with the predicted cross sections for tantalum at 1112.1 keV.

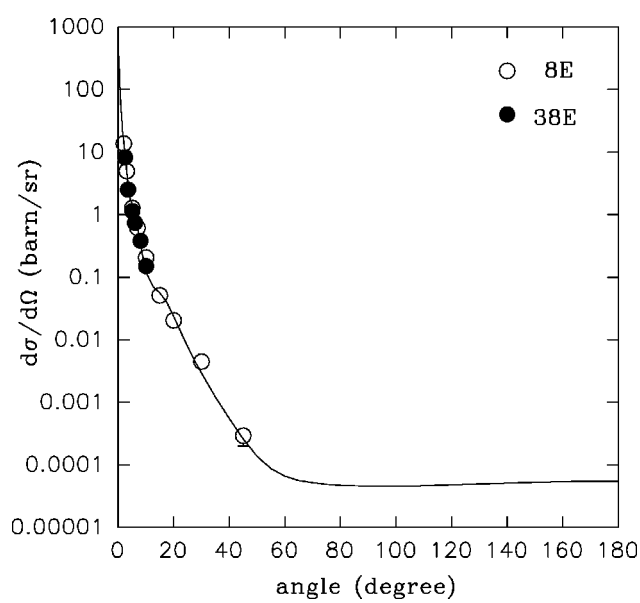

FIG. 31. Comparison of experimental results with the predicted cross sections for tantalum at 1408.0 keV.

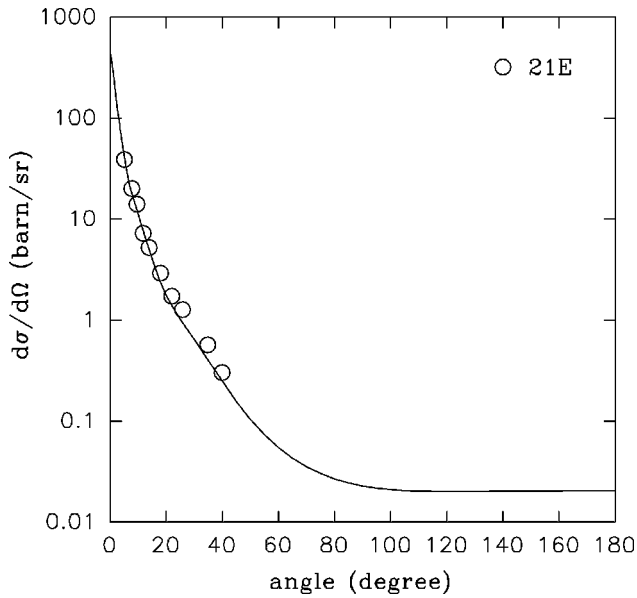

FIG. 32. Comparison of experimental results with the predicted cross sections for tungsten at 316.5 keV.

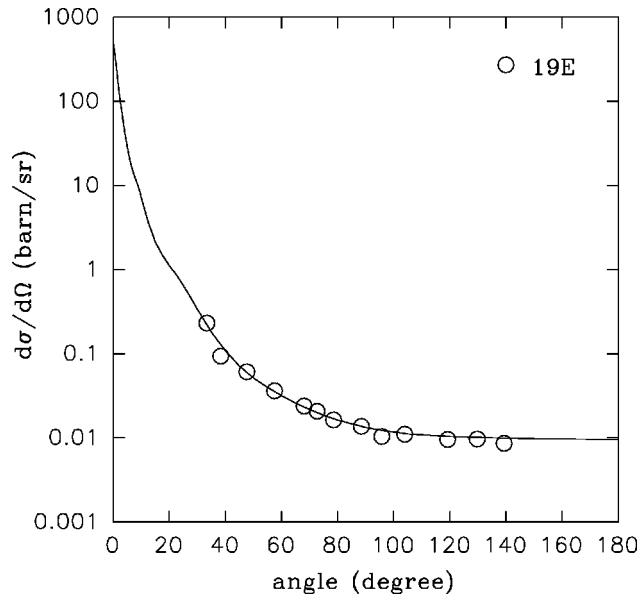

FIG. 34. Comparison of experimental results with the predicted cross sections for platinum at 411.8 keV.

puters available at that time were not fast enough; hence the calculations were limited to only the *K* shell of a single atom and for five photon energies.

With the availability of faster computers in the 1970s, such calculations were first extended by Johnson and Cheng[18] to higher shell electrons (*K*, *L* and *M* shell) and for different atoms in the range $30 \leqslant Z \leqslant 82$ and for five photon energies in the range 145–889 keV. Later, Kissel *et al.*[4] performed systematic partial wave calculations of Rayleigh scattering for *K*-, *L*-, *M*- and *N*-subshell electrons of lead ($Z=82$) and for 12 photon energies in the range 22.1 keV–2.756 MeV, including through the *P* shell in situations where a complete *S*-matrix calculation is important. Note that the *S*-matrix calculation needs an increasing number of multipoles to converge for a given subshell of electrons as the photon energy increases. This can be related to the binding energy of the electron subshell (number of photon multipoles increases as the ratio of photon energy to the binding energy of a given subshell increases). Even with modern computers it is often found to be impractical to perform ''complete''

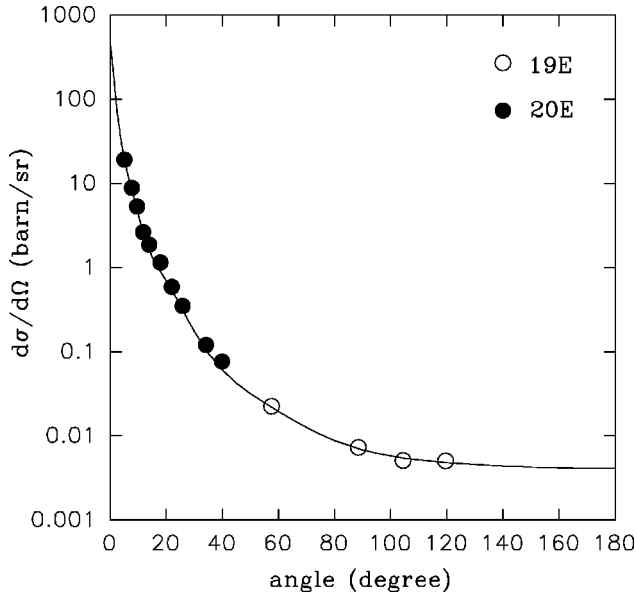

FIG. 33. Comparison of experimental results with the predicted cross sections for tungsten at 468.1 keV.

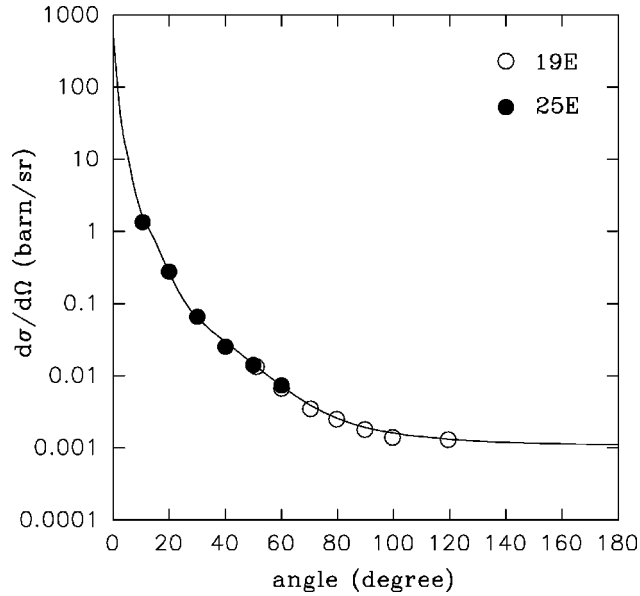

FIG. 35. Comparison of experimental results with the predicted cross sections for platinum at 661.6 keV.

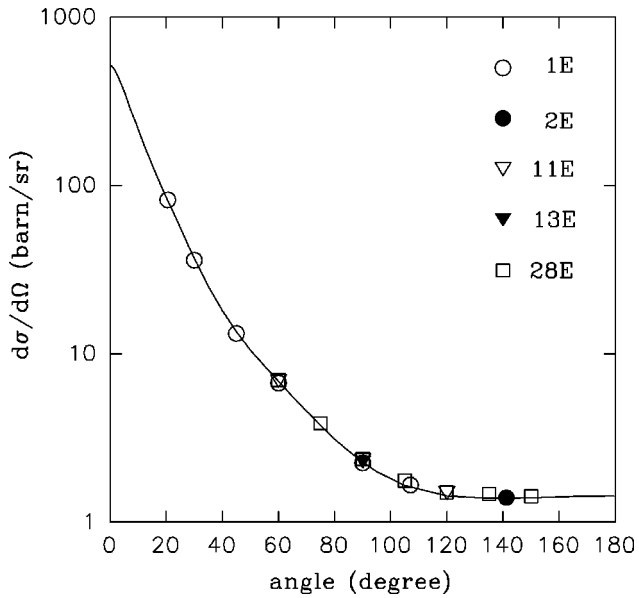

FIG. 36. Comparison of experimental results with the predicted cross sections for lead at 59.54 keV.

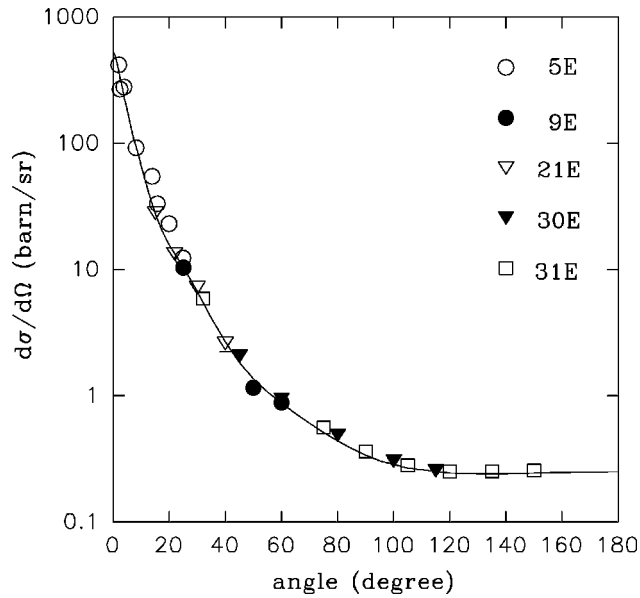

FIG. 38. Comparison of experimental results with the predicted cross sections for lead at 145.4 keV.

(considering all subshell electrons, particularly for high Z atoms and high photon energies) calculations of total atom Rayleigh amplitudes using the S matrix. For this reason the tabulated values of total atom elastic scattering cross sections are only available in the literature for ten elements in the range $13 \leqslant Z \leqslant 103$ and seven selected photon energies 59.5, 145, 279.2, 412, 662, 889 and 1332 keV in 55 angular grids in the range $0 \leqslant \theta \leqslant 180$.[5]

As can be understood from the Feynman diagram of second order S-matrix scattering, exact calculation of Rayleigh amplitudes must include binding effects in the initial, final, and intermediate states. In the present method of S-matrix calculation, the binding effects in these states are included exactly to all orders in the IPA potential and hence sometimes referred to as an ''exact'' calculation. One may argue that the calculation was performed for an isolated atom, in the lowest nonvanishing order of S-matrix expansion, and electron correlation was neglected and therefore the calculation is far from exact. However, it has been found that the higher order correction and correlation effects are not very

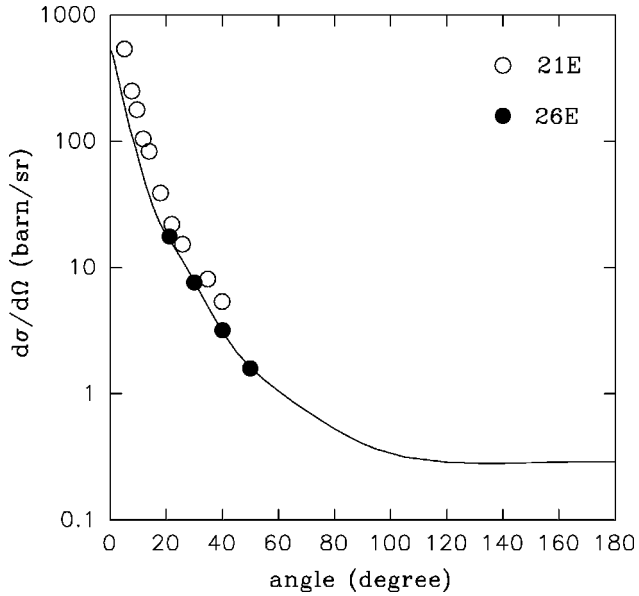

FIG. 37. Comparison of experimental results with the predicted cross sections for lead at 136.5 keV.

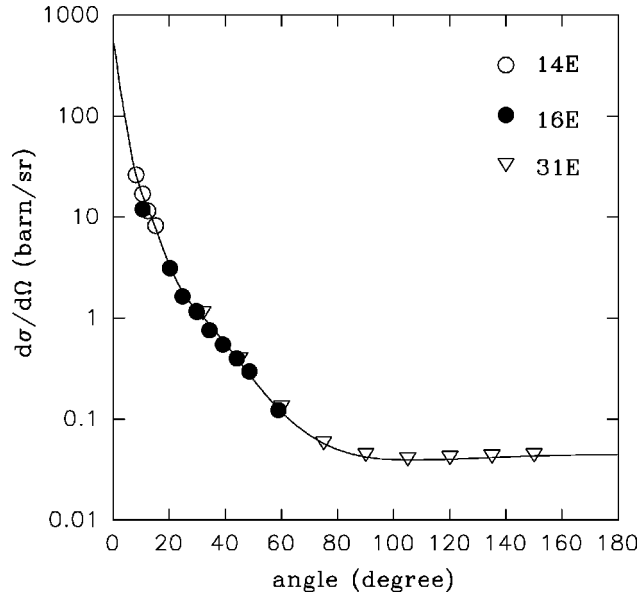

FIG. 39. Comparison of experimental results with the predicted cross sections for lead at 279.2 keV.

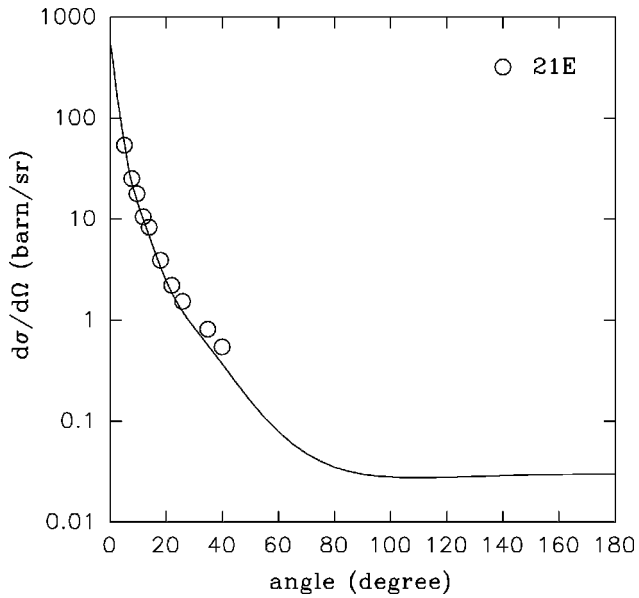

FIG. 40. Comparison of experimental results with the predicted cross sections for lead at 316.5 keV.

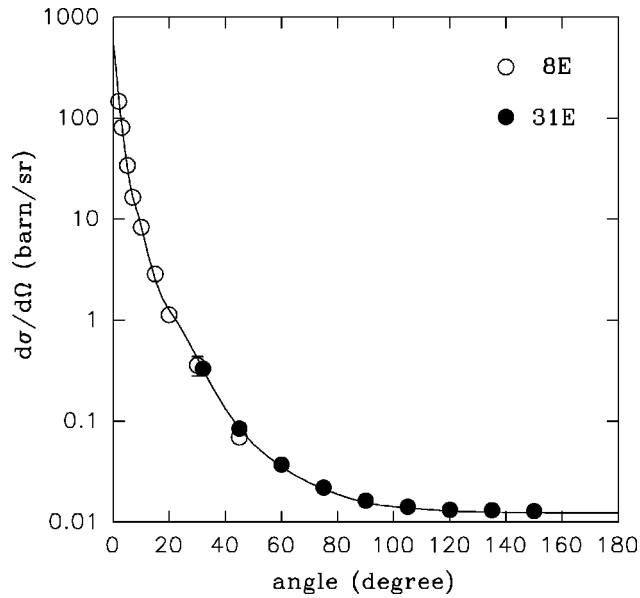

FIG. 42. Comparison of experimental results with the predicted cross sections for lead at 411.8 keV.

important in the photon energies of this article. Nonetheless, calculated scattering amplitudes are accurate within an order of 1% and are so far the best available. Systematic comparison of predicted values in generally good agreement with the available experimental results can be shown as a typical example in Figs. 1–3.

3. Tabulation

The importance of tabulated elastic scattering cross sections for all elements of the periodic table and for a wide energy range is well known. It is realized that since producing such tables using complete numerical calculation of all subshells is not practical, and one may therefore produce such tabulations either by interpolation or parametrization utilizing the available *S*-matrix cross sections. Present tabulations have been made by accurate interpolation of the published precise elastic scattering cross sections[5] of ten elements in the range $13 \leqslant Z \leqslant 103$ and seven photon energies in the range 59.5–1332 keV.

It has been observed that, for energies above the *K* edge, the differential cross section is a smooth function of energy

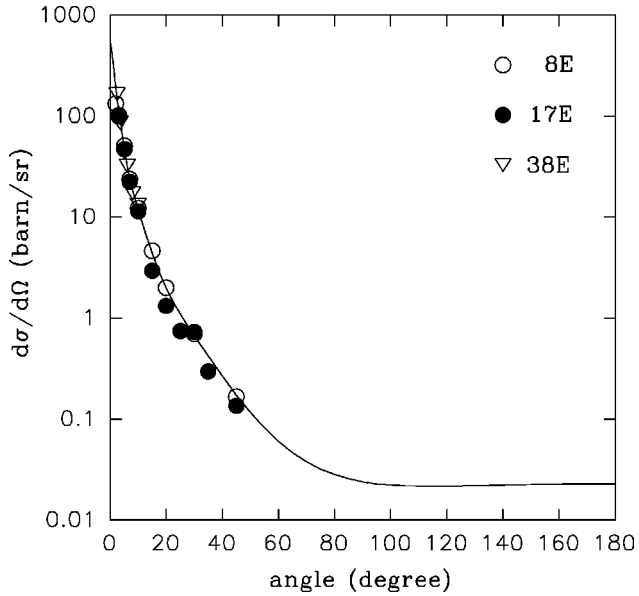

FIG. 41. Comparison of experimental results with the predicted cross sections for lead at 344.3 keV.

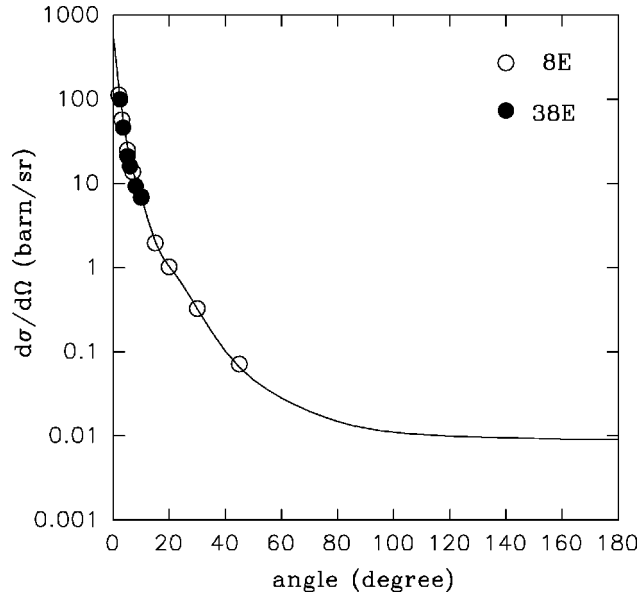

FIG. 43. Comparison of experimental results with the predicted cross sections for lead at 444.0 keV.

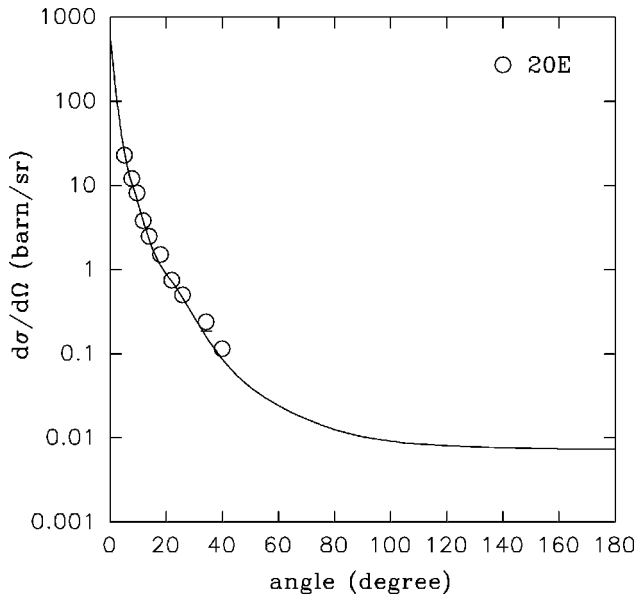

FIG. 44. Comparison of experimental results with the predicted cross sections for lead at 468.1 keV.

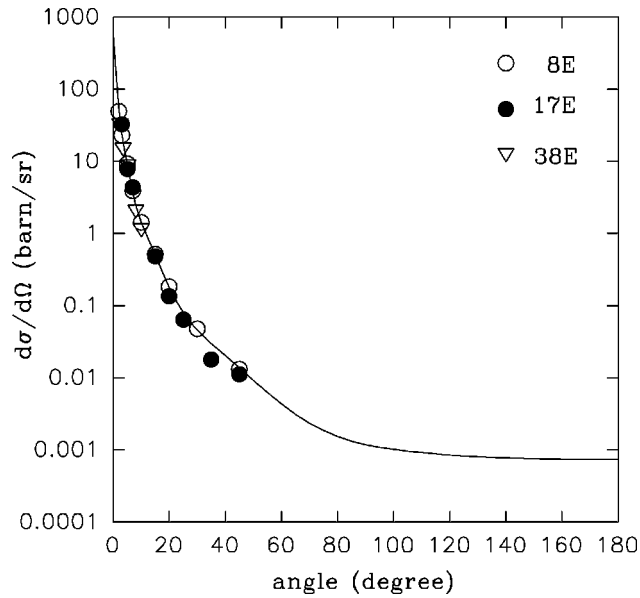

FIG. 46. Comparison of experimental results with the predicted cross sections for lead at 778.9 keV.

of the scattered photon (E), atomic number of the scatterer (Z), and scattering angle (θ). This allows us to use the spline method to interpolate the differential cross section $d\sigma/d\Omega$ hypersurface in the θ, Z, E space. The spline interpolation is done in three steps. In the first step, a quadratic spline interpolation of $\ln(d\sigma/d\Omega)$ as a function of $\ln(Z)$ is done at 16 (θ, E) points, two points in θ and E above and below the required interpolation point. Here three values of $d\sigma/d\Omega$ two steps above and one step below the required Z are used for interpolation. From these interpolated values of $\ln(d\sigma/d\Omega)$ at 16 (θ, E) points, for the given Z, $\ln(d\sigma/d\Omega)$ is interpolated as a function of θ by the cubic spline method. Here $\ln(d\sigma/d\Omega)$ at four values of θ: two below and two above the required value are used for the interpolation. This yields $\ln(d\sigma/d\Omega)$, for the given Z and θ, at four values of E, two below and two above the required value. In the third step a cubic-spline interpolation is used to interpolate $\ln(d\sigma/d\Omega)$ as a function of E, at the required values of E, Z and θ. This process is repeated to interpolate $d\sigma/d\Omega$ at each value of E (at least 5% above the K threshold), Z and θ which has a sufficient num-

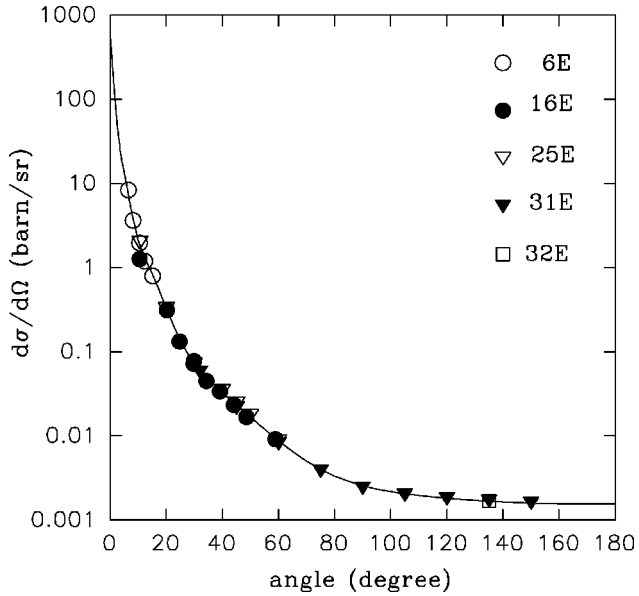

FIG. 45. Comparison of experimental results with the predicted cross sections for lead at 661.6 keV.

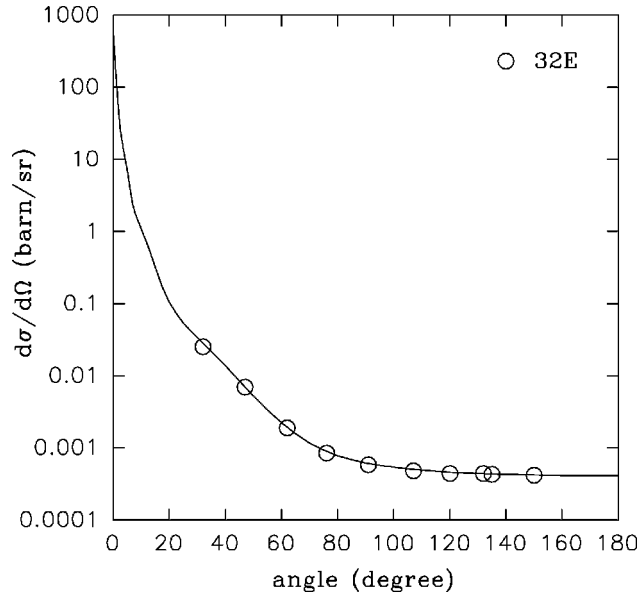

FIG. 47. Comparison of experimental results with the predicted cross sections for lead at 889.3 keV.

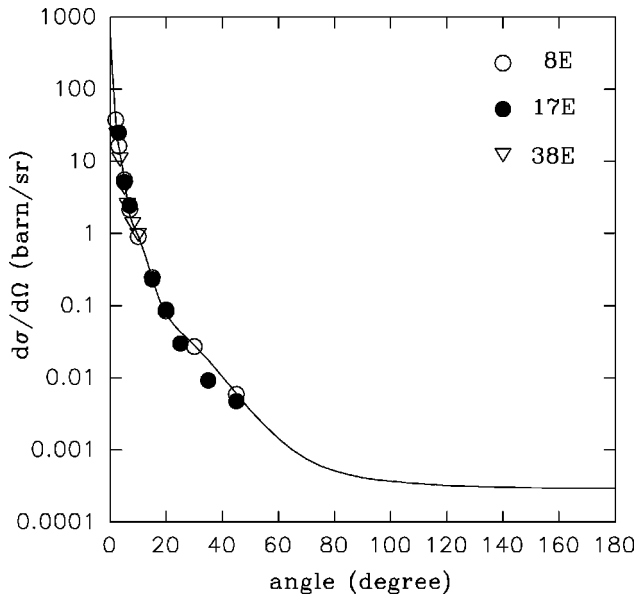

FIG. 48. Comparison of experimental results with the predicted cross sections for lead at 964.0 keV.

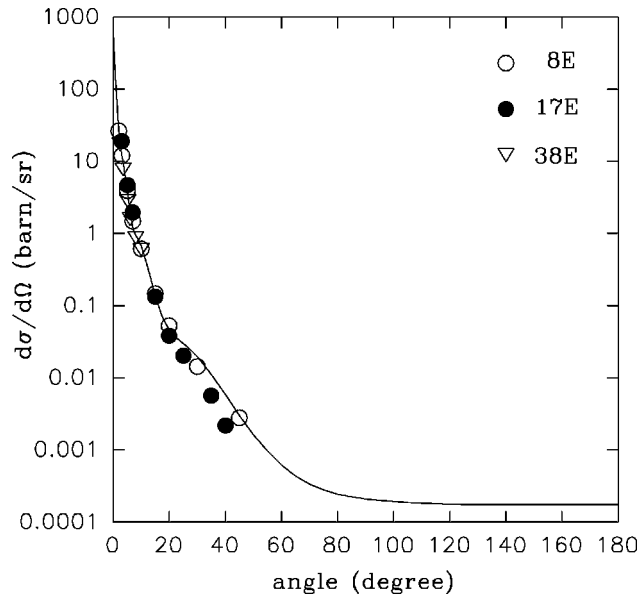

FIG. 50. Comparison of experimental results with the predicted cross sections for lead at 1112.1 keV.

ber of points on each side required for the interpolation. For points near the extremities of E, Z and θ, the distribution of points is suitably altered so that the same number of points are available for interpolation.

In Table 1, we have presented the interpolated differential elastic scattering cross sections for all elements in the range $13 \leqslant Z \leqslant 104$ and for 14 photon energies (50.0, 59.54, 145.4, 316.5, 411.8, 468.1, 661.6, 778.9, 964.0, 1004.8, 1112.1, 1274.5, 1408.0 and 1500.0 keV) for which sufficient experimental data are present (along with suitably chosen extreme energies) and for 55 scattering angles (judiciously chosen depending on the nature of variation of cross sections with angle) in the range $0 \leqslant \theta \leqslant 180$. Energies are chosen in such a way so as to include the commonly used photon energies (except energies at two extremities namely, 50–1500 keV) as well as at a suitable interval so as to enable one to interpolate cross sections for other energies. Energies shown in the table are taken from the CRC Handbook (1985). The cross sections presented in this table include Rayleigh, nuclear Thomson, and Delbruck scattering. Angle integrated elastic scattering cross sections are also presented on the last line for each energy and element. The angle integrated cross sections

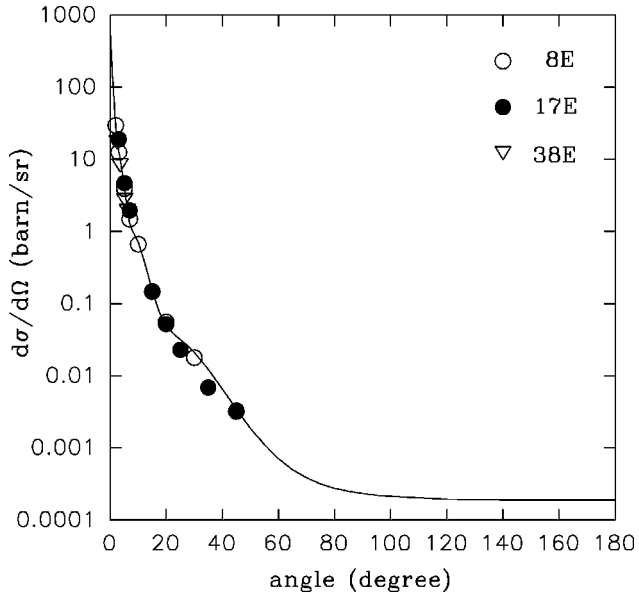

FIG. 49. Comparison of experimental results with the predicted cross sections for lead at 1085.8 keV.

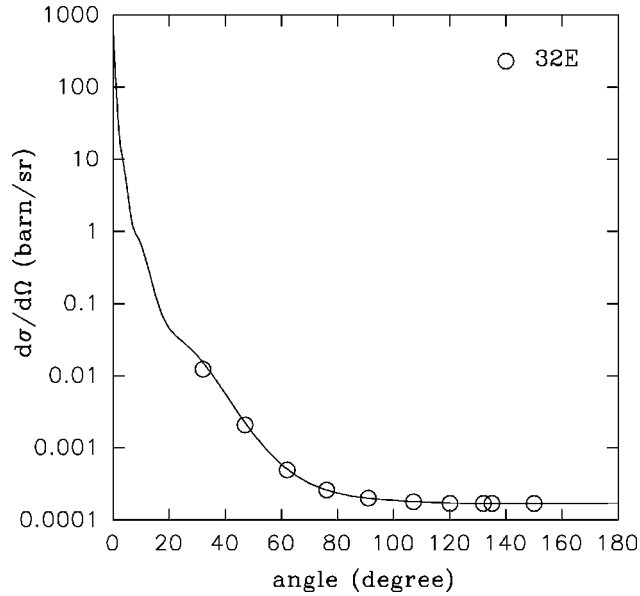

FIG. 51. Comparison of experimental results with the predicted cross sections for lead at 1120.5 keV.

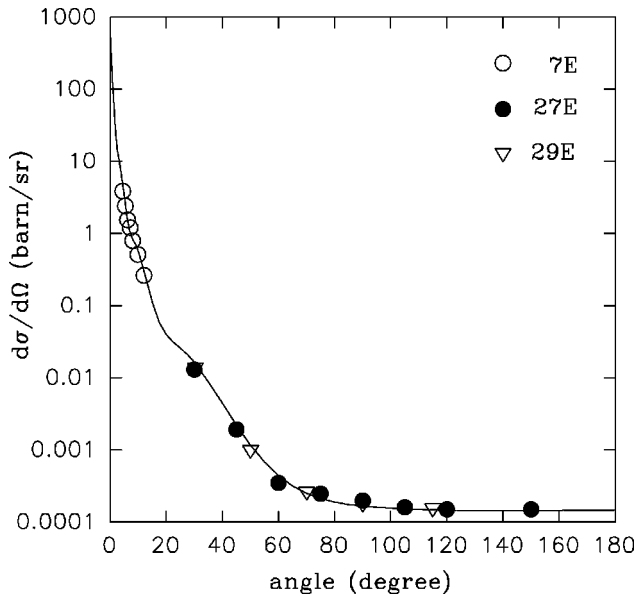

FIG. 52. Comparison of experimental results with the predicted cross sections for lead at 1173.2 keV.

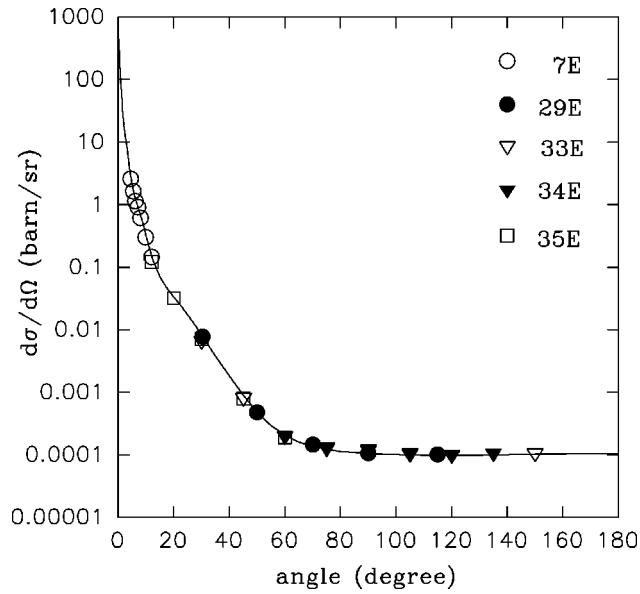

FIG. 54. Comparison of experimental results with the predicted cross sections for lead at 1332.5 keV.

derived using the nonrelativistic form factor available in Ref. 1 and using the relativistic form factor as available in Ref. 2 are also included.

The interpolated cross sections for some elements was checked with the *S*-matrix values. This was done by ignoring the $d\sigma/d\Omega$ at the grid point (E, Z, θ) which is being interpolated. The deviation of the interpolated $d\sigma/d\Omega$ from the tabulated value is found to be less than 1%.

4. Comparison With Experiments

In this section the comparison of measured experimental cross sections with the interpolated cross sections is presented graphically. It should be noted in this connection that the comparison presented here is representative rather than exhaustive. The first experimental studies of elastic scattering of gamma rays were reported in 1932 by Meitner and

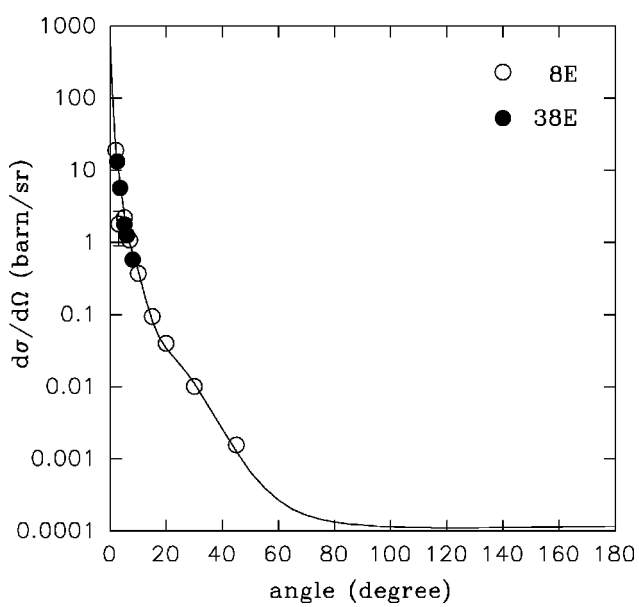

FIG. 53. Comparison of experimental results with the predicted cross sections for lead at 1274.5 keV.

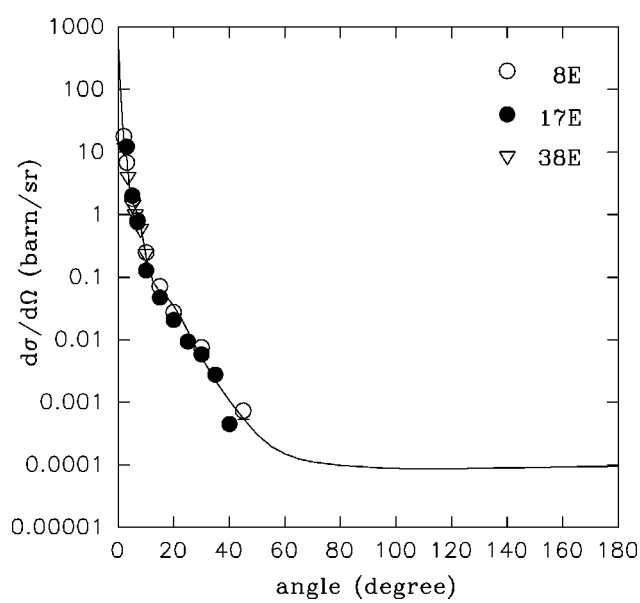

FIG. 55. Comparison of experimental results with the predicted cross sections for lead at 1408.0 keV.

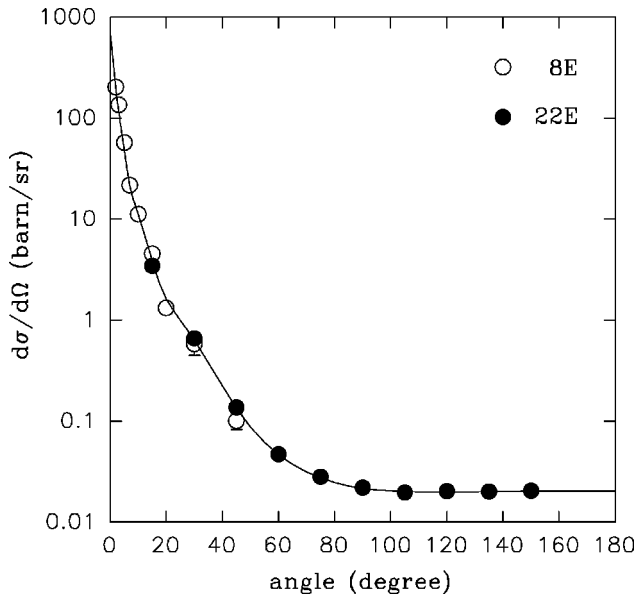

FIG. 56. Comparison of experimental results with the predicted cross sections for uranium at 411.8 keV.

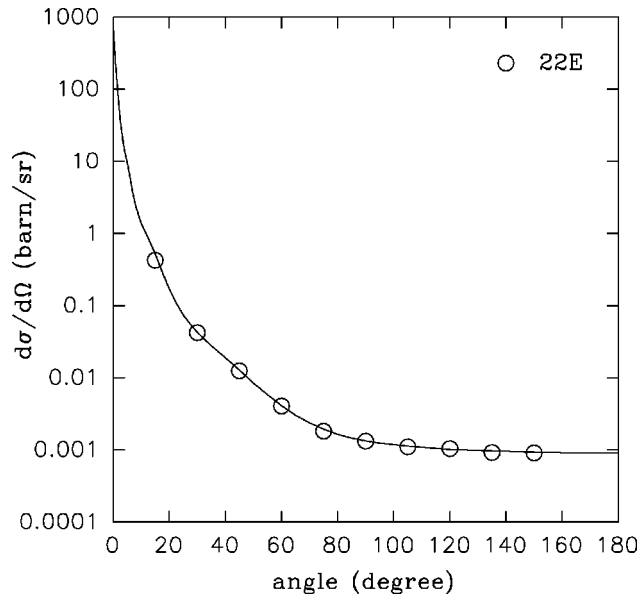

FIG. 58. Comparison of experimental results with the predicted cross sections for uranium at 889.3 keV.

Hupfeld.[19] Considerable experimental activities on the elastic scattering of x rays and gamma rays had been noted from the early 1950s. Ionization chambers were used at that time to detect x rays and gamma rays, which were replaced by the scintillators (mainly thallium drifted sodium iodide) in later years. Scintillators having better detecting efficiencies compared to ionization chambers were used as detector until the late 1960s. Due to their superior energy resolution the solid state detectors (namely germanium–lithium, or high purity germanium) effectively replaced the scintillators used since the early 1970s. In spite of poorer detection efficiency compared to scintillators, solid state detectors due to their superb energy resolution produce precise cross sections. (Use of scintillation detectors in some energies and angles may produce comparable results.) In view of this, in comparing experimental results, we only considered the measurements performed using the solid state detector. In order to give an idea of the extent of experimental measurements performed in this field in Table 2 we present the number of experimental measurements performed on each element at different energies. This will also help to identify the experimentally unexplored region of investigation. In comparing this with our

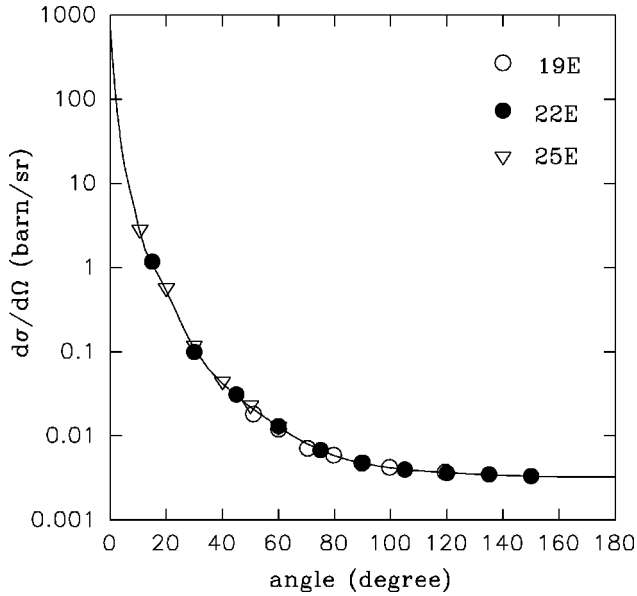

FIG. 57. Comparison of experimental results with the predicted cross sections for uranium at 661.6 keV.

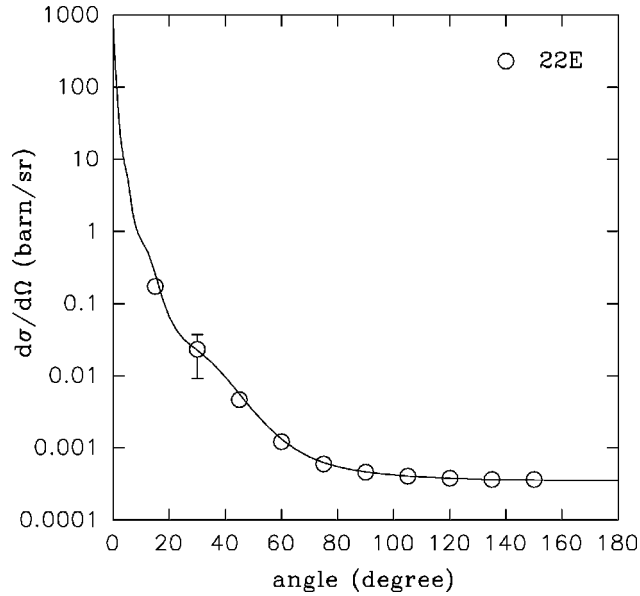

FIG. 59. Comparison of experimental results with the predicted cross sections for uranium at 1120.5 keV.

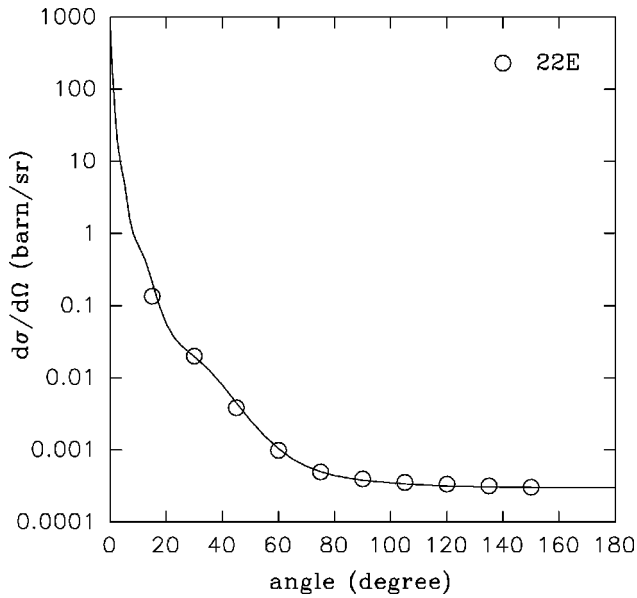

FIG. 60. Comparison of experimental results with the predicted cross sections for uranium at 1173.2 keV.

predicted values graphically, for meaningful comparison, we consider only those elements and energies for which at least ten data points are available. Comparison of experimental values with the predicted values is presented in Figs. 4–61. Table 2, along with the figures, also indicates the region of photon energy and elements for which further measurements are needed. For convenience, the references of experimental measurements are shown separately. As can be seen from the comparison, the predicted values are, in general, in good agreement with the measured values and hence also establish the preciseness of the interpolation method.

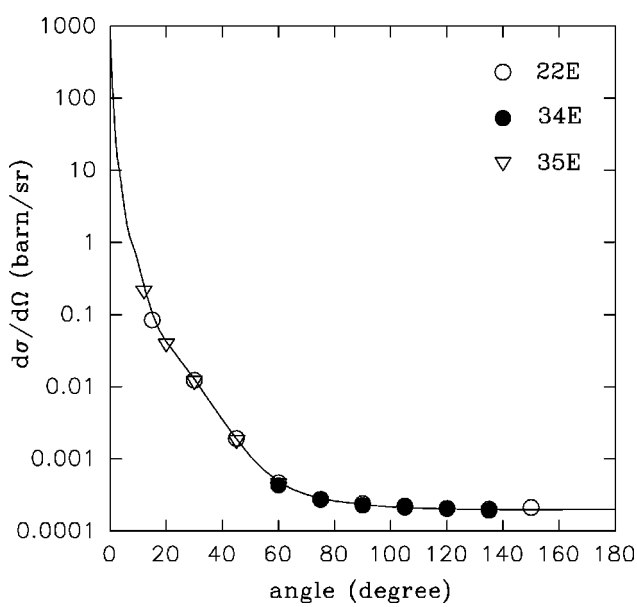

FIG. 61. Comparison of experimental results with the predicted cross sections for uranium at 1332.5 keV.

5. Acknowledgments

Thanks are due to Professor R. H. Pratt of the University of Pittsburgh and to Dr. Lynn Kissel of Lawrence Livermore Laboratories for helpful discussions. Help and assistance by Mala Das in preparing the manuscript is also acknowledged.

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