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Cite as: Journal of Physical and Chemical Reference Data **6**, 615 (1977); <https://doi.org/10.1063/1.555554>
Published Online: 15 October 2009

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Errata

Erratum: Atomic Form Factors, Incoherent Scattering Functions, and Photon Scattering Cross Sections

[J. Phys. Chem. Ref. Data 4, 471 (1975)]

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P. 495: IN TABLE I. Atomic form factor, $F(x, Z)$, and incoherent scattering function, $S(x, Z)$, the values for $S(x, Z)$ for 2 He (helium) for $x = 0.005$ through 0.02 \AA^{-1} should be replaced as follows:

2 He		
$x,$ $\sin(\theta/2)/\lambda$	$S(x, Z)$ (Previous values)	$S(x, Z)$ (Corrected values)
5.00-03	2.1000-03	8.3186-04
1.00-02	5.0000-03	3.3274-03
1.50-02	8.8000-03	7.4867-03
2.00-02	1.4100-02	1.3310-02

These corrected values take advantage of the asymptotic form of $S(x, Z)$ for small x [1]:

$$S(x, Z) = [M(Z)]^2 \cdot (4\pi a_0 x)^2, \quad x \ll 1, \quad (1)$$

given implicitly by Inokuti [2] (his equations 3.17 and 3.18), in which a_0 is the first Bohr radius 0.52917706 \AA and $M(Z)$ is the total dipole-matrix-element. To obtain the above helium $S(x, Z)$ values for small x from the above eq (1) we used, as suggested by Gillespie [1], the value $[M(\text{He})]^2 = 0.752497553$ calculated by Pekeris [3] (the quantity denoted $S(-1)$ in his Table II).

The above corrected $S(x, Z)$ values are in good agreement with the comparable values of $S(x, Z)$ for helium:

$x, \sin(\theta/2)/\lambda (\text{\AA})$	$S(x, Z)$ (Smith et al. [4])
5.00-03	8.376-04
1.00-02	3.347-03
1.50-02	7.521-03
2.00-02	1.334-02

obtained from the recent Smith et al. [4] analytic approximation

$$S(x, Z) = Z[1 - (1 + ax^2 + bx^4)(1 + cx^2 + dx^4)^{-2}], \quad 0 \leq x \leq \infty, \quad (2)$$

which has the correct asymptotic behavior for small [5] as well as large [6] values of x , and in which $a, b, c,$ and d are Z -dependent fitted parameters tabulated in reference [4] for all Z 's 2 to 95.

P. 496: Also in TABLE I, the value of $S(x, Z)$ for 6 C (carbon) for $x = 0.04$ should be replaced as follows:

6 C		
$x,$ $\sin(\theta/2)/\lambda$	$S(x, Z)$ (Previous value)	$S(x, Z)$ (Corrected value)
4.00-02	2.015-02	2.015-01

P. 515: IN TABLE II. Coherent and incoherent scattering cross sections, barns/atom, the values of the incoherent scattering cross section "INCOH" for 2 He

(helium) for photon energies 100 to 1000 eV should be replaced as follows:

Photon energy eV	INCOH (Previous values)	INCOH (Corrected values)
1.0+02	1.524-03	7.194-04
1.5+02	2.559-03	1.618-03
2.0+02	3.793-03	2.876-03
3.0+02	7.081-03	6.438-03
4.0+02	1.183-02	1.144-02
5.0+02	1.796-02	1.768-02
6.0+02	2.543-02	2.523-02
8.0+02	4.426-02	4.413-02
1.0+03	6.767-02	6.759-02

The authors thank G. H. Gillespie and H. E. Johns for these corrections.

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