Isotopic Abundances and Atomic Weights of the Elements

Paul De Bièvre and Marc Gallet
Central Bureau for Nuclear Measurements, Joint Research Centre, Commission of the European Communities, Geel, Belgium

Norman E. Holden
National Nuclear Data Center, Brookhaven National Laboratory, Upton, NY 11973, USA

and

I. Lynus Barnes
National Measurement Laboratory, National Bureau of Standards, Gaithersburg, MD 20859, USA

A large number of measurements describing the isotopic composition of the elements using a variety of analytical methods have been reported since the discovery of the first isotope in 1912. During the past several decades, however, mass spectrometric methods have been used, almost exclusively, to determine the isotopic composition, and thus the atomic weights, of the elements. This evaluated compilation reports the literature references for all complete mass spectrometric measurements published during the period 1920 through 1983. Also given are the isotopic compositions, the isotope ratios, the atomic weights calculated from the data, the appropriate nuclidian masses and an evaluation of the errors of the measurements. For each polynuclidic element, a best measurement has been selected.

Key words: atomic weights; chemical elements; elements; isotopes; isotopic composition; isotope ratios; mass spectrometry.

Contents

1. Introduction ........................................ $10
2. Explanation of Tables ......................... 811
3. Acknowledgments ................................. 812
4. References .................................. 885
   4.1. Commission Reports ..................... 891

List of Tables

Aluminum ........................................... 825
Antimony ......................................... 857
Argon .............................................. 828
Arsenic ........................................... 842
Barium ............................................. 861
Beryllium ......................................... 816
Bismuth ............................................ 883
Boron .............................................. 816
Bromine ........................................... 844
Cadmium .......................................... 853
Caesium ........................................... 860
Calcium ............................................ 830
Carbon ............................................. 818
Cerium ............................................. 863
Chromium .......................................... 834
Cobalt ............................................... 836
Copper .............................................. 838
Dysprosium ....................................... 868
Erbium ............................................. 869
Europium .......................................... 866
Fluorine ............................................ 822
Gadolinium ........................................ 866
Gallium ............................................. 840
Germanium ......................................... 841
Gold .................................................. 876
Hafnium ............................................. 972
Helium .............................................. 813
Holmium ............................................. 869
Hydrogen ............................................ 813
Indium .............................................. 856
Iodine .............................................. 859
Iridium ............................................. 875
Iron .................................................. 836
Krypton .............................................. 844
Lanthanum ......................................... 862
Lead .................................................. 878
Lithium ............................................ 814

©1984 by the U.S. Secretary of Commerce on behalf of the United States. This copyright is assigned to the American Institute of Physics and the American Chemical Society. Reprints available from ACS; see Reprint List at back of issue.

1. Introduction

The first discovery of a stable, "isotopic" of an element, 22Ne, by J.J. Thomson in November 1912 started an era of more refined knowledge of the nature of the elements. This period continued until the report of the discovery of 180Ta by White, Collins and Rourke in 1955, the most recently reported new isotope. Tantalum had been previously believed to be mononuclidic with 180Ta the only stable nuclide.

A variety of measurements describing the terrestrial isotopic composition of the elements has been published, both in the open and in more restricted literature since Thomson's discovery. However, it soon became apparent that the reported measurements frequently did not agree. In some cases, real variations in the natural isotopic composition were reported and have subsequently been verified. In other cases, unjustified high accuracy was claimed, which led to the conclusion that real isotopic variations existed. More recent work has shown that these conclusions were frequently erroneous and that no significant variations in the natural isotopic composition exist in many cases, at least at current measurement precision.

Since there is now a wide scientific interest in isotopic composition and natural isotopic measurements, the authors thought it useful to identify and assemble isotopic abundance literature for all the elements. Much of this literature is not readily available from libraries or in journals, either because it was published only as internal reports of various types, or the data were released from previously classified documents years after the measurements were performed.

This document is an outgrowth of three preliminary unpublished reports prepared in 1963 and 1964 at the Central Bureau of Nuclear Measurements (Joint Research Centre of the Commission of the European Communities), Geel, Belgium. The data presented here were compiled from literature sources there, and from literature files at the General Electric Knolls Atomic Power Laboratory, Schenectady, New York; the Brookhaven National Laboratory, Upton, New York; and the National Bureau of Standards, Gaithersburg, Maryland.

The present evaluated compilation is intended to provide all published data, along with the appropriate literature references, on isotopic abundances which have been reported in the open and available literature. It is limited to data obtained by mass spectrometric methods since, in general, these methods provide measurements of higher precision and accuracy than any other methods available at this time. The literature covered was published from 1940 to the end of 1983. References to literature published prior to 1940 have, in some cases, been included but, primarily due to instrumental limitations inherent in the period 1923—1940 much of that work was considered of lesser value for the purposes of this compilation. In general, literature has only been included for those cases where complete isotopic abundances (or alternatively, all isotopic ratios) have been reported. Much of the available literature in which only variations of individual isotopic ratios have been reported, has been omitted. In most of these cases, variations reported versus some reference material or ratio are not complete and make the calculation of abundances or of meaningful atomic weight values difficult if not impossible.
2. Explanation of the Tables

The elements are listed in the tables in order of increasing atomic number and using the names of the elements, in English, as recommended by the International Union of Pure and Applied Chemistry. For each element, in the line below the name and number of the element is listed the atomic weight (A(E)) recommended by the International Commission on Atomic Weights (now called the IUPAC Commission on Atomic Weights and Isotopic Abundances) in 1961 when these values were recalculated from the oxygen to the carbon. If the recommended value or the uncertainty (U(E)) has changed in the period 1961 to 1983, the changed value and the year of the recommended change are also listed. The references to each of the complete Reports of the Commission during that time are given at the end of this compilation.

In the tables, the appropriate nuclidic masses (in unified atomic mass units, u) for each stable isotope are listed (A.H. Wapstra and K. Bos, Atomic Data and Nuclear Data Tables, 19, 175 (1977)). The uncertainties for these are not repeated here since, in general, the nuclidic masses are known to a precision much greater than that of the corresponding isotopic abundance and, except for the mononuclidic elements, the uncertainty on the nuclidic mass is of lesser importance. The reader is cautioned however, that the levels of precision reached in the past few years in the determination of isotopic abundance values have approached the point where the nuclidic mass uncertainties may no longer be neglected and the most recent nuclidic mass evaluation should be consulted.

The references to the published data are given in chronological order for each element. The isotopic abundances and isotopic ratios are given for each reference. The data are given as presented in the original literature (however, see below). The user should be aware that, in some cases, the isotopic abundances given do not total to 100 percent. Where other information was not given so that corrections could be made (e.g. where isotopic ratios were not published) the data have not been corrected but are given as published. Uncertainties assigned by the original authors to the data are given in brackets and are applicable to the last digits. Where no uncertainties are indicated, none was given in the original literature and those authors are assumed to have intended an error of ±1 on the last digit given (see discussion below).

The authors of this compilation initially decided it would be of use to the majority of readers if both the isotopic composition (isotope abundances in atom percent) and the isotope ratios were presented. Further it was decided that, for the purpose of comparison, it would be useful if the ratios were given with a common base isotope for each element. It should be noted that data were presented in a variety of ways in the original literature. In some cases only abundances were given, in others the isotopic ratios were given but different reference isotopes were used from paper to paper. The necessary calculations have been made to present here both isotopic abundances and isotopic ratios using a common reference isotope. The choice of the base or common isotope was, in many cases, arbitrary although some general guidelines were used. For example, for systems of two isotopes only, the heavier isotope was frequently chosen as the denominator. For systems of more than two isotopes, a moderately abundant (a few percent) isotope near the center of mass for the element was chosen, however, in many cases, there have been other reasons that the majority of authors of data have chosen a common isotope to report the data and we have accepted that choice. To calculate the atomic weight for each entry, it was most convenient to use a computer program developed by one of the authors (ILB) which requires as input the isotopic abundance and the error on the abundance, thus it was necessary to calculate the abundances and the associated errors on the abundances in each case where that was not given in the literature. A small "c" annotating the uncertainty on an abundance indicates that we have calculated that uncertainty from that given for an isotopic ratio in the literature.

Next the atomic weight and its uncertainty are given as calculated from the abundances and the nuclidic masses. In the cases mentioned above, where isotopic abundances do not total to 100 percent, the atomic weight given has been normalized using the simple factor of the difference between the totals given and 100 percent. The indicated uncertainties for the mononuclidic elements were obtained by multiplying the uncertainties given by Wapstra and Bos for the appropriate nuclide by a factor of n. We believe that this gives an uncertainty as consistent as possible with those given for the polynuclidic elements.

An indication of the type of uncertainty quoted in the original literature is given below the atomic weight value as follows:

"NS" is used to indicate that an error value was not stated in the original literature.

"SD", "2XSD", and "3XSD" indicates that the author stated the errors to be 1, 2, or 3 standard deviations.

"P" indicates probable error (as defined by the author).

"SE" indicates standard error.

In the final row of the table a "C" has been placed if the measurement is known to be one which is calibrated with the use of separated isotopes thus becoming an "absolute" measurement. In a few cases the "C" has been appended where the effects of measurement fractionation have been removed by the use of the "double spike" technique, and where this was judged to have been done with particular care in the preparation and calibration of the spike solutions. A "B" has been added to the measurement which has been judged to be the best measurement from a natural source. The designation of "best measurement" was generally done on the basis of a calibrated measurement or a double spiked measurement. If
neither were available for an element, the most precise measurement was chosen from the group of published literature which gave sufficient detail of the measurement process for the authors to judge that reasonable care had been taken to eliminate the more common sources of error. As a result, the reader should note that the best measurement is not necessarily a good one.

Finally, in the last column (Ref. 83ICA1) the isotopic abundances are given as recommended by the IUPAC Subcommittee on the Assessment of Isotopic Composition of the Commission on Atomic Weights and Isotopic Abundances as "representative" for the element. In some cases, where it is known that the isotopic abundances for an element do not vary in nature and a calibrated measurement is available, the representative composition is the same as the best measurement. In other cases, the representative compositions are given with less precision, either because no calibrated measurements are available, or the possibility of small changes in isotopic composition exists. In general, however, these may be taken as the composition which might be expected in an average bottle of reagent chemicals. Nevertheless, the user should be aware that materials are available in commerce where the isotopic composition may vary considerably from these values (this is particularly true of the elements B, Li, and U). If more accurate values are needed, the reader is urged to obtain and use specially analyzed samples. The reader is referred to a recent publication by Peiser et al. for additional information on representative isotopic compositions and the effects of these on atomic weights (H.S. Peiser, L.L. Barnes, P.J. De Bièvre, J.R. De Laeter, R. Hagemann, N.E. Holden, T.J. Murphy, E. Roth, M. Shima, and H.G. Thode, "Element by Element Review of their Atomic Weights". Pure Appl. Chem. 56, 696 (1984).

The last section of this publication contains the complete reference to the data. The reference system contains was originally developed by one of the authors (NEH) for the General Electric Wall Chart of the Nuclides and is based on using the last two digits of the year of publication, followed by the first three letters of the first author's last (family) name and is followed by a single digit serial number.

The authors hope that this evaluated compilation will be of help to the scientist interested in the isotopic abundance of the elements and will help save the tedious effort of searching the literature, particularly since many of the original citations are no longer readily available. Additional information from those references may be obtained from the authors.

As mentioned above, this compilation was developed over a number of years. Every effort has been made to make it as complete as possible but it is inevitable that the authors have, inadvertently, missed some important references. We would be most grateful if readers would draw these to our attention. We would also appreciate receiving copies of reprints of papers that might be included in a future update of this compilation.

3. Acknowledgments

Many helpful discussions with the author's colleagues on the Commission on Atomic Weights and Isotopic Abundances and, especially, those who served on the Subcommittee for Isotopic Abundances have added to the completeness of this compilation and their assistance and encouragement is gratefully acknowledged. Much appreciation is due to H.S. Peiser, T.J. Murphy, N.N. Greenwood, and E.R. Cohen whose careful reading of the manuscript and thoughtful suggestions have helped to make it more readable and useful. We owe a special debt of gratitude to the late A.E. "Gus" Cameron who was always ready to help and who offered freely from his vast knowledge of the field. We also thank Ann Lawrence, Teresa Sperow, Gelene Hensley, and Joy Shoemaker whose skills and patience in the preparation of the manuscript made it possible.
### ISOTOPIC ABUNDANCES AND ATOMIC WEIGHTS OF THE ELEMENTS

#### Element \( ^1\text{H} \) Hydrogen

<table>
<thead>
<tr>
<th>Mass no.</th>
<th>Nuclidic mass</th>
<th>36HAL1</th>
<th>38MOR1</th>
<th>38VOS1</th>
</tr>
</thead>
<tbody>
<tr>
<td>2</td>
<td>2.014101787</td>
<td>0.0156 (5)C</td>
<td>0.0161 (5)C</td>
<td>0.01492 (11)C</td>
</tr>
</tbody>
</table>

Isotope ratio 2/1:
- 0.0001563 (42)
- 0.0001613 (52)
- 0.00014922

Atomic weight:
- 1.007982 (5)
- 1.007987 (5)
- 1.0079752 (1)

Error:
- NS
- NS
- NS

Annotation

### Element \( ^2\text{He} \) Helium

<table>
<thead>
<tr>
<th>Mass no.</th>
<th>Nuclidic mass</th>
<th>39SWAL1</th>
<th>51KIR1</th>
<th>51KIR1</th>
<th>54CLA1</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>1.007825037</td>
<td>99.9855</td>
<td>99.9861 (1)</td>
<td>99.9847 (1)</td>
<td>99.9848 (3)</td>
</tr>
<tr>
<td>2</td>
<td>2.014101787</td>
<td>0.0145</td>
<td>0.0139 (1)</td>
<td>0.0153 (1)</td>
<td>0.0152 (3)</td>
</tr>
</tbody>
</table>

Isotope ratio 2/1:
- 0.0001449
- 0.00013902
- 0.00015302
- 0.00015200

Atomic weight:
- 1.007971 (1)
- 1.007955 (1)
- 1.007979 (1)
- 1.007976 (3)

Error:
- NS
- SD
- SD
- SD

Annotation

### Element \( ^3\text{He} \) Helium

<table>
<thead>
<tr>
<th>Mass no.</th>
<th>Nuclidic mass</th>
<th>60HOR1</th>
<th>60HOR1</th>
<th>70HAG1</th>
<th>83ICA1</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>1.007825037</td>
<td>99.98511 (5)</td>
<td>99.98531 (5)</td>
<td>99.984426 (5)C</td>
<td>99.986 (1)</td>
</tr>
<tr>
<td>2</td>
<td>2.014101787</td>
<td>0.01489 (5)</td>
<td>0.01469 (5)</td>
<td>0.015574 (5)C</td>
<td>0.015 (1) (for water only)</td>
</tr>
</tbody>
</table>

Isotope ratio 2/1:
- 0.00014692
- 0.00015787
- 0.00015576 (5)
- 0.000150

Atomic weight:
- 1.0079749 (5)
- 1.0079729 (5)
- 1.00798176 (5)
- 1.00798 (1)

Error:
- P
- P
- 2XSD

Annotation:
- C, B

---

### Element $^2$He Helium—continued

<table>
<thead>
<tr>
<th>Mass no.</th>
<th>Nuclidian mass</th>
<th>47FAI1</th>
<th>48ALD1</th>
<th>7(MAM)</th>
<th>76CLAI</th>
</tr>
</thead>
<tbody>
<tr>
<td>3</td>
<td>3.016029297</td>
<td>0.00013</td>
<td>0.000120 (12)c</td>
<td>0.0001399 (13)</td>
<td>0.0001384 (6)</td>
</tr>
</tbody>
</table>

Isotope ratio 3/4  
$1.3 \times 10^{-6}$  
$1.2 \times 10^{-6}$ (2)  
$1.399 \times 10^{-6}$ (13)  
$1.384 \times 10^{-6}$ (6)  

Atomic weight  
$4.00260001$ (1)  
$4.00260001$ (2)  
$4.00260000$ (4)  

Error  
NS  
SD  
SD  
SD  

Annotation  
B

<table>
<thead>
<tr>
<th>Mass no.</th>
<th>Nuclidian mass</th>
<th>84ICA1</th>
</tr>
</thead>
<tbody>
<tr>
<td>3</td>
<td>3.016029297</td>
<td>0.000138 (3)</td>
</tr>
<tr>
<td>4</td>
<td>4.00260325</td>
<td>99.999862 (3)</td>
</tr>
</tbody>
</table>

(is for air only)  
Isotope ratio 3/4  
$1.380 \times 10^{-6}$  

Atomic weight  
$4.00260001$ (1)  

Error  

Annotation

### Element $^3$Li Lithium

<table>
<thead>
<tr>
<th>Mass no.</th>
<th>Nuclidian mass</th>
<th>32AST1</th>
<th>47ING3</th>
<th>48ING4</th>
<th>48WHI1</th>
</tr>
</thead>
<tbody>
<tr>
<td>6</td>
<td>6.0151232</td>
<td>8.33</td>
<td>7.366 (22)c</td>
<td>7.407 (33)c</td>
<td>7.299 (37)c</td>
</tr>
<tr>
<td>7</td>
<td>7.0160045</td>
<td>91.67</td>
<td>92.614 (22)c</td>
<td>92.593 (33)c</td>
<td>92.701 (37)c</td>
</tr>
</tbody>
</table>

Isotope ratio 7/6  
11  
12.54 (4)  
12.50 (5)  
12.7 (7)  

Atomic weight  
$6.9326$ (1)  
$6.9421$ (2)  
$6.9419$ (3)  
$5.9429$ (4)  

Error  
NS  
NS  
NS  
SD  

Annotation

<table>
<thead>
<tr>
<th>Mass no.</th>
<th>Nuclidian mass</th>
<th>56ORD1</th>
<th>56ORD1</th>
<th>56PAC1</th>
<th>56WHI1</th>
</tr>
</thead>
<tbody>
<tr>
<td>6</td>
<td>6.0151232</td>
<td>7.413 (11)c</td>
<td>7.418 (11)c</td>
<td>7.519 (57)</td>
<td>8.12</td>
</tr>
<tr>
<td>7</td>
<td>7.0160045</td>
<td>92.587 (11)c</td>
<td>92.582 (11)c</td>
<td>92.481 (57)</td>
<td>91.88</td>
</tr>
</tbody>
</table>

Isotope ratio 7/6  
12.40 (2)  
12.40 (2)  
12.2 (1)  
11.32  

Atomic weight  
$6.9418$ (1)  
$6.9418$ (1)  
$6.9407$ (6)  
$6.9347$ (1)  

Error  
NS  
NS  
NS  
NS  

Annotation
### ISOTOPIC ABUNDANCES AND ATOMIC WEIGHTS OF THE ELEMENTS

#### Lithium

<table>
<thead>
<tr>
<th>Mass no.</th>
<th>Nuclidic mass</th>
<th>58OMUL</th>
<th>58PALL</th>
<th>58PALL</th>
<th>60OMUL</th>
</tr>
</thead>
<tbody>
<tr>
<td>7</td>
<td>7.0160045</td>
<td>92.532 (28)C</td>
<td>92.531 (55)C</td>
<td>92.552 (28)C</td>
<td>92.532 (22)C</td>
</tr>
</tbody>
</table>

**Isotope ratio 7/6**<br>12.48 (5) 12.47 (1) 12.37 (5) 12.48 (5)

**Atomic weight**<br>NS (7) NS (4) NS (7) NS (7)

**Error**<br>NS NS 3xSD NS

#### Lead

<table>
<thead>
<tr>
<th>Mass no.</th>
<th>Nuclidic mass</th>
<th>60OMUL</th>
<th>60PALL</th>
<th>60PALL</th>
<th>62PALL</th>
</tr>
</thead>
<tbody>
<tr>
<td>6</td>
<td>6.0151232</td>
<td>7.605 (10)C</td>
<td>7.629 (10)C</td>
<td>7.4239 (55)</td>
<td>7.490 (17)C</td>
</tr>
<tr>
<td>7</td>
<td>7.0160045</td>
<td>92.396 (10)C</td>
<td>92.371 (10)C</td>
<td>92.5761 (55)</td>
<td>92.510 (17)C</td>
</tr>
</tbody>
</table>

**Isotope ratio 7/6**<br>12.15 (1) 12.108 (10) 12.47 12.35 (3)

**Atomic weight**<br>6.9399 (1) 6.9396 (1) 6.94170 (5) 6.9410 (2)

**Error**<br>NS NS 3xSD NS

#### Sodium

<table>
<thead>
<tr>
<th>Mass no.</th>
<th>Nuclidic mass</th>
<th>62TAN2</th>
<th>62TAN2</th>
<th>62TAN2</th>
<th>63SHI4</th>
</tr>
</thead>
<tbody>
<tr>
<td>7</td>
<td>7.0160045</td>
<td>92.526 (10)C</td>
<td>92.526 (17)C</td>
<td>92.532 (10)C</td>
<td>92.31 (12)C</td>
</tr>
</tbody>
</table>

**Isotope ratio 7/6**<br>12.38 (1) 12.38 (3) 12.39 (1) 12.0 (2)

**Atomic weight**<br>6.9412 (1) 6.9412 (2) 6.9413 (1) 6.939 (1)

**Error**<br>SE SE SE SD

#### Strontium

<table>
<thead>
<tr>
<th>Mass no.</th>
<th>Nuclidic mass</th>
<th>64KRAI</th>
<th>65SVE1</th>
<th>66SHI2</th>
<th>66SHI2</th>
</tr>
</thead>
<tbody>
<tr>
<td>7</td>
<td>7.0160045</td>
<td>92.443 (46)C</td>
<td>92.437 (28)C</td>
<td>92.37 (10)C</td>
<td>92.54 (17)C</td>
</tr>
</tbody>
</table>

**Isotope ratio 7/6**<br>12.18 (1) 12.22 (5) 12.1 (1) 12.4 (3)

**Atomic weight**<br>0.9401 (5) 0.9400 (3) 0.940 (1) 0.941 (2)

**Error**<br>3xSD SD SD SD
### Element $^3$Li Lithium—continued

<table>
<thead>
<tr>
<th>Mass no.</th>
<th>Nuclidic mass</th>
<th>73FLE1</th>
<th>77FRI01</th>
<th>83MCI1</th>
<th>84ICAI</th>
</tr>
</thead>
<tbody>
<tr>
<td>6</td>
<td>6.0151232</td>
<td>7.68 (2)C</td>
<td>7.602 (37)</td>
<td>7.525 (29)</td>
<td>7.5 (2)</td>
</tr>
<tr>
<td>7</td>
<td>7.0160045</td>
<td>92.32 (2)C</td>
<td>92.398 (37)</td>
<td>92.475 (29)</td>
<td>92.5 (2)</td>
</tr>
<tr>
<td>Isotope ratio 7/6</td>
<td>12.02 (3)</td>
<td>12.15</td>
<td>12.29 (5)</td>
<td>12.3</td>
<td></td>
</tr>
<tr>
<td>Atomic weight</td>
<td>6.9391 (2)</td>
<td>6.9399 (4)</td>
<td>6.9407 (3)</td>
<td>6.941 (2)</td>
<td></td>
</tr>
<tr>
<td>Error</td>
<td>SD</td>
<td>2XSD</td>
<td>2XSD</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Annotation</td>
<td>C, C, D</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### Element $^4$Be Beryllium

<table>
<thead>
<tr>
<th>Mass no.</th>
<th>Nuclidic mass</th>
<th>73FLE1</th>
<th>77FRI01</th>
<th>83MCI1</th>
<th>84ICAI</th>
</tr>
</thead>
<tbody>
<tr>
<td>9</td>
<td>9.0121825</td>
<td>100</td>
<td>100</td>
<td>100</td>
<td></td>
</tr>
<tr>
<td>Isotope ratio</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Atomic weight</td>
<td>9.012182 (2)</td>
<td>9.012182 (2)</td>
<td>9.012182 (2)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Error</td>
<td>NS</td>
<td>NS</td>
<td>NS</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Annotation</td>
<td>B</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### Element $^5$B Boron

<table>
<thead>
<tr>
<th>Mass no.</th>
<th>Nuclidic mass</th>
<th>46HNL1</th>
<th>48TH01</th>
<th>48TH01</th>
<th>500551</th>
</tr>
</thead>
<tbody>
<tr>
<td>10</td>
<td>10.0129380</td>
<td>18.83 (2)</td>
<td>18.98</td>
<td>18.45</td>
<td>19.57</td>
</tr>
<tr>
<td>11</td>
<td>11.0093053</td>
<td>81.17 (2)</td>
<td>81.02</td>
<td>81.55</td>
<td>80.43</td>
</tr>
<tr>
<td>Isotope ratio 11/10</td>
<td>4.31</td>
<td>4.27</td>
<td>4.42</td>
<td>4.11</td>
<td></td>
</tr>
<tr>
<td>Atomic weight</td>
<td>10.8217 (2)</td>
<td>10.8202 (1)</td>
<td>10.8255 (1)</td>
<td>10.8143 (1)</td>
<td></td>
</tr>
<tr>
<td>Error</td>
<td>NS</td>
<td>NS</td>
<td>NS</td>
<td>NS</td>
<td></td>
</tr>
<tr>
<td>Annotation</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

---

### ISOTOPIC ABUNDANCES AND ATOMIC WEIGHTS OF THE ELEMENTS

**Element 5B Boron—continued**

<table>
<thead>
<tr>
<th>Mass no.</th>
<th>Nuclidic Mass</th>
<th>60BEM1</th>
<th>61FIN1</th>
<th>61FIN1</th>
<th>61GOR1</th>
</tr>
</thead>
<tbody>
<tr>
<td>10</td>
<td>10.0129380</td>
<td>19.27  (13)</td>
<td>19.92</td>
<td>19.72</td>
<td>19.83</td>
</tr>
<tr>
<td>11</td>
<td>11.0099053</td>
<td>80.73  (13)</td>
<td>80.08</td>
<td>80.28</td>
<td>80.17</td>
</tr>
<tr>
<td>Isotope ratio 11/10</td>
<td>4.09</td>
<td>4.019</td>
<td>4.070</td>
<td>4.044</td>
<td></td>
</tr>
<tr>
<td>Atomic weight</td>
<td>10.017  (1)</td>
<td>10.0100  (1)</td>
<td>10.0120  (1)</td>
<td>10.0117  (1)</td>
<td></td>
</tr>
<tr>
<td>Error</td>
<td>3XSD</td>
<td>SD</td>
<td>SD</td>
<td>2XSD</td>
<td></td>
</tr>
</tbody>
</table>

**Annotation**

<table>
<thead>
<tr>
<th>Mass no.</th>
<th>Nuclidic mass</th>
<th>61GOR1</th>
<th>61GOR1</th>
<th>61MCMI</th>
<th>61MCMI</th>
</tr>
</thead>
<tbody>
<tr>
<td>10</td>
<td>10.0129380</td>
<td>19.93</td>
<td>20.00</td>
<td>19.84</td>
<td>19.84</td>
</tr>
<tr>
<td>11</td>
<td>11.0099053</td>
<td>80.07</td>
<td>80.00</td>
<td>80.16</td>
<td>80.16</td>
</tr>
<tr>
<td>Isotope ratio 11/10</td>
<td>4.017</td>
<td>4.000</td>
<td>4.040</td>
<td>4.040</td>
<td></td>
</tr>
<tr>
<td>Atomic weight</td>
<td>10.8107  (1)</td>
<td>10.8100  (1)</td>
<td>10.8116  (1)</td>
<td>10.8116  (1)</td>
<td></td>
</tr>
<tr>
<td>Error</td>
<td>2XSD</td>
<td>2XSD</td>
<td>NS</td>
<td>NS</td>
<td></td>
</tr>
</tbody>
</table>

**Annotation**

<table>
<thead>
<tr>
<th>Mass no.</th>
<th>Nuclidic mass</th>
<th>61MCMI</th>
<th>61MCMI</th>
<th>63SH13</th>
<th>6381EI</th>
</tr>
</thead>
<tbody>
<tr>
<td>10</td>
<td>10.0129380</td>
<td>19.73</td>
<td>19.72</td>
<td>19.80</td>
<td>19.82  (3)</td>
</tr>
<tr>
<td>11</td>
<td>11.0099053</td>
<td>80.27</td>
<td>80.28</td>
<td>80.20</td>
<td>80.18  (3)</td>
</tr>
<tr>
<td>Isotope ratio 11/10</td>
<td>4.068</td>
<td>4.077</td>
<td>4.06</td>
<td>4.04%</td>
<td></td>
</tr>
<tr>
<td>Atomic weight</td>
<td>10.8127  (1)</td>
<td>10.8128  (1)</td>
<td>10.8120  (1)</td>
<td>10.8118  (3)</td>
<td></td>
</tr>
<tr>
<td>Error</td>
<td>NS</td>
<td>NS</td>
<td>NS</td>
<td>SD</td>
<td></td>
</tr>
</tbody>
</table>

**Annotation**

<table>
<thead>
<tr>
<th>Mass no.</th>
<th>Nuclidic mass</th>
<th>6381EI</th>
<th>68AGY1</th>
<th>68AGY1</th>
<th>6981EI</th>
</tr>
</thead>
<tbody>
<tr>
<td>10</td>
<td>10.0129380</td>
<td>20.14  (2)</td>
<td>19.58  (3)</td>
<td>20.05  (3)</td>
<td>19.824  (20)</td>
</tr>
<tr>
<td>11</td>
<td>11.0099053</td>
<td>79.86  (2)</td>
<td>80.42  (3)</td>
<td>79.95  (3)</td>
<td>80.176  (20)</td>
</tr>
<tr>
<td>Isotope ratio 11/10</td>
<td>3.965</td>
<td>4.108  (8)</td>
<td>3.987  (8)</td>
<td>4.0444  (52)</td>
<td></td>
</tr>
<tr>
<td>Atomic weight</td>
<td>10.8096  (2)</td>
<td>10.8142  (3)</td>
<td>10.8095  (3)</td>
<td>10.8118  (2)</td>
<td></td>
</tr>
<tr>
<td>Error</td>
<td>SD</td>
<td>2XSE</td>
<td>2XSE</td>
<td>3XSD</td>
<td></td>
</tr>
</tbody>
</table>

**Annotation**
Element $^5\text{B}$ Boron—continued

<table>
<thead>
<tr>
<th>Mass no.</th>
<th>Nuclidic mass</th>
<th>70CAT1</th>
<th>71GEN1</th>
<th>73NOM1</th>
<th>73TAM1</th>
</tr>
</thead>
<tbody>
<tr>
<td>10</td>
<td>10.0129380</td>
<td>19.827 (13)</td>
<td>19.9 (2)$^C$</td>
<td>19.85 (1)$^C$</td>
<td>19.83 (3)$^C$</td>
</tr>
<tr>
<td>11</td>
<td>11.0093053</td>
<td>80.173 (13)</td>
<td>80.1 (2)$^C$</td>
<td>80.15 (1)$^C$</td>
<td>80.17 (3)$^C$</td>
</tr>
</tbody>
</table>

Isotope ratio 11/10

| Isotope ratio 11/10 | 4.0436 (33) | 4.03 (4) | 4.039 (2) | 4.042 (5) |

Atomic weight

| Atomic weight | 10.8118 (2) | 10.811 (2) | 10.8115 (1) | 10.8117 (3) |

Error

| Error | 3XSD | SD | SD | SD |

Annotation

Element $^6\text{C}$ Carbon

<table>
<thead>
<tr>
<th>Mass no.</th>
<th>Nuclidic mass</th>
<th>37BRO1</th>
<th>39NIE3</th>
<th>39NIE3</th>
<th>41MUR2</th>
</tr>
</thead>
<tbody>
<tr>
<td>12</td>
<td>12.01115 (5)</td>
<td>98.927 (43)$^C$</td>
<td>98.866 (23)$^C$</td>
<td>98.900 (22)$^C$</td>
<td>98.891 (22)$^C$</td>
</tr>
<tr>
<td>13</td>
<td>13.003564839</td>
<td>1.073 (43)$^C$</td>
<td>1.134 (23)$^C$</td>
<td>1.100 (22)$^C$</td>
<td>1.169 (22)$^C$</td>
</tr>
</tbody>
</table>

Isotope ratio 12/13

| Isotope ratio 12/13 | 92.2 (3.7) | 87.2 (1.8) | 89.9 (1.8) | 89.2 (1.8) |

Atomic weight

| Atomic weight | 12.0108 (4) | 12.0114 (2) | 12.0110 (2) | 12.0111 (2) |

Error

| Error | NS | SD | SD | NS |

Annotation

Element $^7\text{C}$ Carbon

<table>
<thead>
<tr>
<th>Mass no.</th>
<th>Nuclidic mass</th>
<th>41MUR2</th>
<th>48RAN1</th>
<th>48RAN1</th>
<th>48RAN2</th>
</tr>
</thead>
<tbody>
<tr>
<td>12</td>
<td>12.01115 (5)</td>
<td>98.827 (43)$^C$</td>
<td>98.866 (43)$^C$</td>
<td>98.900 (43)$^C$</td>
<td>98.891 (43)$^C$</td>
</tr>
<tr>
<td>13</td>
<td>13.003564839</td>
<td>1.073 (43)$^C$</td>
<td>1.134 (43)$^C$</td>
<td>1.100 (43)$^C$</td>
<td>1.169 (43)$^C$</td>
</tr>
</tbody>
</table>

Isotope ratio 12/13

| Isotope ratio 12/13 | 92.2 (1.8) | 92.9 (5) | 88.4 (5) | 88.4 |

Atomic weight

| Atomic weight | 12.0107 (2) | 12.0109 (5) | 12.01122 (6) | 12.01123 (1) |

Error

| Error | NS | NS | NS | NS |

Annotation

---

## ISOTOPIC ABUNDANCES AND ATOMIC WEIGHTS OF THE ELEMENTS

### Element C Carbon—continued

<table>
<thead>
<tr>
<th>Mass no.</th>
<th>Nuclidic mass</th>
<th>4BRANZ</th>
<th>50TRO1</th>
<th>50BEC1</th>
<th>50NIE1</th>
</tr>
</thead>
<tbody>
<tr>
<td>12</td>
<td>12.003169</td>
<td>98.947</td>
<td>98.891</td>
<td>98.878 (5)</td>
<td>98.892 (4)</td>
</tr>
<tr>
<td>13</td>
<td>13.003354839</td>
<td>1.063</td>
<td>1.109</td>
<td>1.124 (5)</td>
<td>1.108 (4)</td>
</tr>
<tr>
<td>Isotope ratio 12/13</td>
<td>93.1</td>
<td>89.17</td>
<td>87.97</td>
<td>89.25</td>
<td></td>
</tr>
<tr>
<td>Atomic weight</td>
<td>12.01067 (1)</td>
<td>12.01113 (1)</td>
<td>12.01128 (5)</td>
<td>12.01112 (4)</td>
<td></td>
</tr>
<tr>
<td>Error</td>
<td>NS</td>
<td>NS</td>
<td>NS</td>
<td>NS</td>
<td>P</td>
</tr>
</tbody>
</table>

### Mass no. 61MAR1 61MAR1 61WIC1 61WIC1

<table>
<thead>
<tr>
<th>Mass no.</th>
<th>Nuclidic mass</th>
<th>61MAR1</th>
<th>61MAR1</th>
<th>61WIC1</th>
<th>61WIC1</th>
</tr>
</thead>
<tbody>
<tr>
<td>12</td>
<td>12.003169</td>
<td>98.930 (11)(^\text{C})</td>
<td>98.878 (11)(^\text{C})</td>
<td>98.8787 (13)(^\text{C})</td>
<td>98.881 (12)(^\text{C})</td>
</tr>
<tr>
<td>13</td>
<td>13.003354839</td>
<td>1.070 (11)(^\text{C})</td>
<td>1.122 (11)(^\text{C})</td>
<td>1.1212 (12)(^\text{C})</td>
<td>1.110 (12)(^\text{C})</td>
</tr>
<tr>
<td>Isotope ratio 12/13</td>
<td>92.5 (1.0)</td>
<td>88.1 (1.0)</td>
<td>88.18 (10)</td>
<td>88.36 (10)</td>
<td></td>
</tr>
<tr>
<td>Atomic weight</td>
<td>12.0107 (1)</td>
<td>12.0113 (1)</td>
<td>12.01126 (11)</td>
<td>12.0112 (1)</td>
<td></td>
</tr>
<tr>
<td>Error</td>
<td>NS</td>
<td>NS</td>
<td>NS</td>
<td>NS</td>
<td>NS</td>
</tr>
</tbody>
</table>

### Mass no. 51WIC1 51WIC2 51WIC2 520181

<table>
<thead>
<tr>
<th>Mass no.</th>
<th>Nuclidic mass</th>
<th>51WIC1</th>
<th>51WIC2</th>
<th>51WIC2</th>
<th>520181</th>
</tr>
</thead>
<tbody>
<tr>
<td>12</td>
<td>12.003169</td>
<td>98.8824 (12)(^\text{C})</td>
<td>98.9095 (36)(^\text{C})</td>
<td>98.8777 (38)(^\text{C})</td>
<td>98.9130 (59)(^\text{C})</td>
</tr>
<tr>
<td>13</td>
<td>13.003354839</td>
<td>1.1176 (12)(^\text{C})</td>
<td>1.0905 (36)(^\text{C})</td>
<td>1.1223 (38)(^\text{C})</td>
<td>1.0870 (59)(^\text{C})</td>
</tr>
<tr>
<td>Isotope ratio 12/13</td>
<td>90.48 (10)</td>
<td>90.48 (10)</td>
<td>90.48 (10)</td>
<td>90.48 (10)</td>
<td></td>
</tr>
<tr>
<td>Atomic weight</td>
<td>12.01121 (1)</td>
<td>12.01094 (4)</td>
<td>12.01126 (4)</td>
<td>12.0109 (6)</td>
<td></td>
</tr>
<tr>
<td>Error</td>
<td>NS</td>
<td>NS</td>
<td>NS</td>
<td>2xSD</td>
<td></td>
</tr>
</tbody>
</table>

### Mass no. 52WIC1 52WIC1 53CRA1 53CRA1

<table>
<thead>
<tr>
<th>Mass no.</th>
<th>Nuclidic mass</th>
<th>52WIC1</th>
<th>52WIC1</th>
<th>53CRA1</th>
<th>53CRA1</th>
</tr>
</thead>
<tbody>
<tr>
<td>12</td>
<td>12.003169</td>
<td>98.9181 (12)(^\text{C})</td>
<td>98.8912 (12)(^\text{C})</td>
<td>98.87678 (25)(^\text{C})</td>
<td>98.92658 (23)(^\text{C})</td>
</tr>
<tr>
<td>13</td>
<td>13.003354839</td>
<td>1.0819 (12)(^\text{C})</td>
<td>1.1088 (12)(^\text{C})</td>
<td>1.12322 (25)(^\text{C})</td>
<td>1.07342 (23)(^\text{C})</td>
</tr>
<tr>
<td>Isotope ratio 12/13</td>
<td>91.43 (10)</td>
<td>89.19 (10)</td>
<td>88.03 (2)</td>
<td>92.16 (2)</td>
<td></td>
</tr>
<tr>
<td>Atomic weight</td>
<td>12.01086 (1)</td>
<td>12.01112 (1)</td>
<td>12.01270 (2)</td>
<td>12.010770 (2)</td>
<td></td>
</tr>
<tr>
<td>Error</td>
<td>NS</td>
<td>NS</td>
<td>P</td>
<td>P</td>
<td></td>
</tr>
<tr>
<td>Mass no.</td>
<td>Nuclidic Mass</td>
<td>53DAN1</td>
<td>53DAN2</td>
<td>53DAN3</td>
<td>53DAN4</td>
</tr>
<tr>
<td>--------</td>
<td>---------------</td>
<td>--------</td>
<td>--------</td>
<td>--------</td>
<td>--------</td>
</tr>
<tr>
<td>12</td>
<td>12.</td>
<td>98.88891 (74)°</td>
<td>98.9116 (71)°</td>
<td>98.8982 (74)°</td>
<td>98.8885 (76)°</td>
</tr>
<tr>
<td>13</td>
<td>13.003354839</td>
<td>1.11309 (74)°</td>
<td>1.0884 (71)°</td>
<td>1.1018 (74)°</td>
<td>1.1115 (76)°</td>
</tr>
<tr>
<td>Isotope ratio 12/13</td>
<td>88.84 (6)</td>
<td>90.88 (6)</td>
<td>88.76 (6)</td>
<td>87.97 (6)</td>
<td></td>
</tr>
<tr>
<td>Error</td>
<td>NS</td>
<td>NS</td>
<td>NS</td>
<td>NS</td>
<td></td>
</tr>
</tbody>
</table>

Annotation

<table>
<thead>
<tr>
<th>Mass no.</th>
<th>Nuclidic mass</th>
<th>53WIC1</th>
<th>53WIC2</th>
<th>55LAN1</th>
<th>55LAN2</th>
</tr>
</thead>
<tbody>
<tr>
<td>12</td>
<td>12.</td>
<td>98.9128 (12)°</td>
<td>98.8746 (13)°</td>
<td>98.9143 (14)°</td>
<td>98.8963 (20)°</td>
</tr>
<tr>
<td>13</td>
<td>13.003354839</td>
<td>1.0872 (12)°</td>
<td>1.1254 (13)°</td>
<td>1.0867 (14)°</td>
<td>1.1047 (20)°</td>
</tr>
<tr>
<td>Isotope ratio 12/13</td>
<td>90.96 (10)</td>
<td>87.86 (10)</td>
<td>91.11 (12)</td>
<td>89.52 (16)</td>
<td></td>
</tr>
<tr>
<td>Atomic weight</td>
<td>12.01091 (1)</td>
<td>12.01129 (1)</td>
<td>12.01069 (1)</td>
<td>12.01106 (2)</td>
<td></td>
</tr>
<tr>
<td>Error</td>
<td>2XSD</td>
<td>2XSD</td>
<td>SD</td>
<td>SD</td>
<td></td>
</tr>
</tbody>
</table>

Annotation

<table>
<thead>
<tr>
<th>Mass no.</th>
<th>Nuclidic Mass</th>
<th>57CRT1</th>
<th>57CRT2</th>
<th>57GAV1</th>
<th>57GAV2</th>
</tr>
</thead>
<tbody>
<tr>
<td>12</td>
<td>12.</td>
<td>98.889 (3)°</td>
<td>98.91992 (58)°</td>
<td>98.90074 (50)°</td>
<td></td>
</tr>
<tr>
<td>13</td>
<td>13.003354839</td>
<td>1.111 (3)°</td>
<td>1.08108 (58)°</td>
<td>1.09926 (60)°</td>
<td></td>
</tr>
<tr>
<td>Isotope ratio 12/13</td>
<td>89.05 (27)</td>
<td>91.50 (5)</td>
<td>89.97 (5)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Atomic weight</td>
<td>12.01115 (3)</td>
<td>12.010847 (6)</td>
<td>12.01029 (6)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Error</td>
<td>P</td>
<td>NS</td>
<td>NS</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Annotation

<table>
<thead>
<tr>
<th>Mass no.</th>
<th>Nuclidic Mass</th>
<th>83ICAT</th>
</tr>
</thead>
<tbody>
<tr>
<td>12</td>
<td>12.</td>
<td>98.90 (3)</td>
</tr>
<tr>
<td>13</td>
<td>13.003354839</td>
<td>1.10 (3)</td>
</tr>
<tr>
<td>Isotope ratio 12/13</td>
<td>89.91</td>
<td></td>
</tr>
<tr>
<td>Atomic weight</td>
<td>12.0110 (3)</td>
<td></td>
</tr>
<tr>
<td>Error</td>
<td>Annotation</td>
<td></td>
</tr>
</tbody>
</table>

# ISOTOPIC ABUNDANCES AND ATOMIC WEIGHTS OF THE ELEMENTS

## Element 14N Nitrogen

**1961 14.0067**

<table>
<thead>
<tr>
<th>Mass no.</th>
<th>Nuclidic mass</th>
<th>50NIEI</th>
<th>58JUNI</th>
<th>63PIL1</th>
<th>63PIL1</th>
</tr>
</thead>
<tbody>
<tr>
<td>14</td>
<td>14.003074008</td>
<td>99.6350 (13)°</td>
<td>99.63370 (40)°</td>
<td>99.6366 (53)°</td>
<td>99.6361</td>
</tr>
<tr>
<td>15</td>
<td>15.000108978</td>
<td>0.3650 (13)°</td>
<td>0.36630 (40)°</td>
<td>0.3634 (53)°</td>
<td>0.3639</td>
</tr>
<tr>
<td>Isotope ratio 14/15</td>
<td>272 (1)</td>
<td>272.0 (3)</td>
<td>274.1 (4)</td>
<td>273.0 (4)</td>
<td></td>
</tr>
<tr>
<td>Atomic weight</td>
<td>14.00671 (1)</td>
<td>14.006726 (4)</td>
<td>14.006697 (5)</td>
<td>14.00670 (5)</td>
<td></td>
</tr>
<tr>
<td>Error</td>
<td>P</td>
<td>NS</td>
<td>NS</td>
<td>NS</td>
<td></td>
</tr>
<tr>
<td>Annotation</td>
<td>C, B</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Mass no.</th>
<th>Nuclidic mass</th>
<th>63PIL1</th>
<th>83ICAI</th>
</tr>
</thead>
<tbody>
<tr>
<td>14</td>
<td>14.003074008</td>
<td>99.6353 (5)°</td>
<td>99.634 (9)</td>
</tr>
<tr>
<td>15</td>
<td>15.000108978</td>
<td>0.3647 (5)°</td>
<td>0.366 (9)</td>
</tr>
<tr>
<td>Isotope ratio 14/15</td>
<td>273.2 (4)</td>
<td>272.2</td>
<td></td>
</tr>
<tr>
<td>Atomic weight</td>
<td>14.006710 (5)</td>
<td>14.00672 (9)</td>
<td></td>
</tr>
<tr>
<td>Error</td>
<td>NS</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Annotation</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

## Element 16O Oxygen

**1961 15.9994**

<table>
<thead>
<tr>
<th>Mass no.</th>
<th>Nuclidic mass</th>
<th>41MURI</th>
<th>44TH01</th>
<th>49HIB1</th>
<th>49HIB2</th>
</tr>
</thead>
<tbody>
<tr>
<td>16</td>
<td>15.9991464</td>
<td>99.7598 (74)°</td>
<td>99.7574 (37)°</td>
<td>99.770 (5)</td>
<td>99.775 (6)</td>
</tr>
<tr>
<td>17</td>
<td>16.9991306</td>
<td>0.0407 (20)°</td>
<td>0.03920 (80)°</td>
<td>0.035 (9)</td>
<td>0.035 (9)</td>
</tr>
<tr>
<td>18</td>
<td>17.99915939</td>
<td>0.1995 (60)°</td>
<td>0.2034 (6)°</td>
<td>0.196 (10)</td>
<td>0.190 (10)</td>
</tr>
<tr>
<td>Isotope ratio 16/18, 17/18</td>
<td>500. (15)</td>
<td>490.4 (8.6)</td>
<td>509</td>
<td>525</td>
<td></td>
</tr>
<tr>
<td>Atomic weight</td>
<td>15.9993 (1)</td>
<td>15.99938 (5)</td>
<td>15.99919 (3)</td>
<td>15.99907 (3)</td>
<td></td>
</tr>
<tr>
<td>Error</td>
<td>NS</td>
<td>NS</td>
<td>SD</td>
<td>SD</td>
<td></td>
</tr>
<tr>
<td>Annotation</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
### Element \(^{16}\)O Oxygen—continued

<table>
<thead>
<tr>
<th>Mass no.</th>
<th>Nuclidic mass</th>
<th>50NiE1</th>
<th>50NiE2</th>
<th>76BaE1</th>
<th>83IcA1</th>
</tr>
</thead>
<tbody>
<tr>
<td>16</td>
<td>15.99491464</td>
<td>99.75769 (50)(^{C})</td>
<td>99.75873 (70)(^{C})</td>
<td>99.7628 (5)(^{C})</td>
<td>99.762 (15)</td>
</tr>
<tr>
<td>17</td>
<td>16.9991306</td>
<td>0.03766 (10)(^{C})</td>
<td>0.03736 (50)(^{C})</td>
<td>0.0372 (4)(^{C})</td>
<td>0.038 (3)</td>
</tr>
<tr>
<td>18</td>
<td>17.99915939</td>
<td>0.20465 (50)(^{C})</td>
<td>0.20391 (50)(^{C})</td>
<td>0.200045 (5)</td>
<td>0.200 (12)</td>
</tr>
</tbody>
</table>

**Isotope ratio 16/18, 17/18**

<table>
<thead>
<tr>
<th></th>
<th>16(^{C})</th>
<th>17(^{C})</th>
<th>18(^{C})</th>
</tr>
</thead>
<tbody>
<tr>
<td>16/18</td>
<td>487.44 (58)</td>
<td>489.24 (59)</td>
<td>498.7 (2.2)</td>
</tr>
<tr>
<td>17/18</td>
<td>0.1840 (3)</td>
<td>0.1832 (12)</td>
<td>0.1860</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>0.190</td>
</tr>
</tbody>
</table>

**Atomic weight**

|        | 15.99939 (1) | 15.99938 (1) | 15.999296 (6) | 15.9993 (3) |

**Error**

|       | \(P\) | \(P\) | \(SD\) |

**Annotation**

C, B

---

### Element \(^{19}\)F Fluorine


<table>
<thead>
<tr>
<th>Mass no.</th>
<th>Nuclidic mass</th>
<th>20Ast1</th>
<th>83IcA1</th>
</tr>
</thead>
<tbody>
<tr>
<td>19</td>
<td>18.99840325</td>
<td>100</td>
<td>100</td>
</tr>
</tbody>
</table>

**Isotope ratio**

<table>
<thead>
<tr>
<th></th>
<th>20Ast1</th>
<th>83IcA1</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>-</td>
<td>-</td>
</tr>
</tbody>
</table>

**Atomic weight**

|        | 18.9984032 (8) | 18.9984032 (8) |

**Error**

|       | \(NS\) |

**Annotation**

---

### Element \(^{20}\)Ne Neon


<table>
<thead>
<tr>
<th>Mass no.</th>
<th>Nuclidic mass</th>
<th>47DiB1</th>
<th>49Hib2</th>
<th>50NiE2</th>
<th>58WAn1</th>
</tr>
</thead>
<tbody>
<tr>
<td>20</td>
<td>19.9924391</td>
<td>90.51 (18)</td>
<td>89.99 (3)</td>
<td>90.92 (4)</td>
<td>90.87 (9)</td>
</tr>
<tr>
<td>21</td>
<td>21.9913837</td>
<td>9.49 (7)</td>
<td>9.90 (1)</td>
<td>9.077 (1)</td>
<td>9.17 (1)</td>
</tr>
<tr>
<td>22</td>
<td>21.9913837</td>
<td>9.21 (16)</td>
<td>9.72 (1)</td>
<td>8.82 (14)</td>
<td>8.82 (6)</td>
</tr>
</tbody>
</table>

**Isotope ratio 21/20, 22/20**

<table>
<thead>
<tr>
<th></th>
<th>21/20</th>
<th>22/20</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>0.0032</td>
<td>0.1016</td>
</tr>
<tr>
<td></td>
<td>0.0033</td>
<td>0.1090</td>
</tr>
<tr>
<td></td>
<td>0.002827 (6)</td>
<td>0.09703 (40)</td>
</tr>
<tr>
<td></td>
<td>0.0034</td>
<td>0.0971</td>
</tr>
</tbody>
</table>

**Atomic weight**

|        | 20.179 (3) | 20.1897 (4) | 20.1713 (8) | 20.172 (2) |

**Error**

|       | \(SD\) | \(SD\) | \(3XP\) | \(SD\) |

**Annotation**
### ISOTOPIC ABUNDANCES AND ATOMIC WEIGHTS OF THE ELEMENTS

Element $^{10}$Ne Neon--continued

<table>
<thead>
<tr>
<th>Mass no.</th>
<th>Nuclidic mass</th>
<th>65EBEI</th>
<th>66WALL</th>
<th>71MELI</th>
<th>83ICAI</th>
</tr>
</thead>
<tbody>
<tr>
<td>20</td>
<td>19.9924391</td>
<td>90.50 (7)</td>
<td>90.514 (31)</td>
<td>90.512 (8)</td>
<td>90.51 (9)</td>
</tr>
<tr>
<td>21</td>
<td>20.9938453</td>
<td>0.268 (2)</td>
<td>0.266 (5)</td>
<td>0.267 (1)</td>
<td>0.27 (2)</td>
</tr>
<tr>
<td>22</td>
<td>21.9913837</td>
<td>9.23 (7)</td>
<td>9.220 (29)</td>
<td>9.221 (6)</td>
<td>9.22 (9)</td>
</tr>
<tr>
<td>Isotope ratio 21/20, 22/20</td>
<td>0.002959 (22)</td>
<td>0.002935 (58)</td>
<td>0.00295</td>
<td>0.00298</td>
<td></td>
</tr>
<tr>
<td></td>
<td>0.10204 (33)</td>
<td>0.10187 (38)</td>
<td>0.10188</td>
<td>0.1019</td>
<td></td>
</tr>
<tr>
<td>Atomic weights</td>
<td>20.179 (1)</td>
<td>20.1794 (6)</td>
<td>20.1794 (6)</td>
<td>20.179 (2)</td>
<td></td>
</tr>
<tr>
<td>Error</td>
<td>3XSE</td>
<td>NS</td>
<td>NS</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Annotation</td>
<td>C</td>
<td>C, B</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

#### Element $^{11}$Na Sodium

1961 22.9898 1971 22.98977

<table>
<thead>
<tr>
<th>Mass no.</th>
<th>Nuclidic mass</th>
<th>66WALL</th>
</tr>
</thead>
<tbody>
<tr>
<td>23</td>
<td>22.9897697</td>
<td>100</td>
</tr>
<tr>
<td>Isotope ratio</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Atomic weight</td>
<td>22.989770 (5)</td>
<td>22.989770 (5)</td>
</tr>
<tr>
<td>Error</td>
<td>NS</td>
<td></td>
</tr>
<tr>
<td>Annotation</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

#### Element $^{12}$Mg Magnesium

1961 24.312 1967 24.305

<table>
<thead>
<tr>
<th>Mass no.</th>
<th>Nuclidic mass</th>
<th>48H1B1</th>
<th>48H1B1</th>
<th>48H1B1</th>
<th>56W1H1</th>
</tr>
</thead>
<tbody>
<tr>
<td>24</td>
<td>23.9650450</td>
<td>78.98 (4)</td>
<td>78.97 (3)</td>
<td>78.60 (13)</td>
<td>78.8 (2)</td>
</tr>
<tr>
<td>25</td>
<td>24.9658392</td>
<td>10.06 (2)</td>
<td>10.01 (2)</td>
<td>10.11 (5)</td>
<td>10.15 (1)</td>
</tr>
<tr>
<td>26</td>
<td>25.9825954</td>
<td>10.97 (4)</td>
<td>11.02 (4)</td>
<td>11.29 (8)</td>
<td>11.06 (1)</td>
</tr>
<tr>
<td>Isotope ratio 25/24, 26/24</td>
<td>0.1272</td>
<td>0.1266</td>
<td>0.1266</td>
<td>0.1288</td>
<td></td>
</tr>
<tr>
<td></td>
<td>0.1389</td>
<td>0.1397</td>
<td>0.1436</td>
<td>0.1404</td>
<td></td>
</tr>
<tr>
<td>Atomic weight</td>
<td>24.3048 (8)</td>
<td>24.3054 (7)</td>
<td>24.312 (2)</td>
<td>24.308 (3)</td>
<td></td>
</tr>
<tr>
<td>Error</td>
<td>SE</td>
<td>SE</td>
<td>SD</td>
<td>NS</td>
<td></td>
</tr>
<tr>
<td>Annotation</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

---

### DE BIÈVRE ET AL.

Element $^{12}$Mg Magnesium---continued

<table>
<thead>
<tr>
<th>Mass no.</th>
<th>Nuclidic mass</th>
<th>600MU1</th>
<th>64ShI2</th>
<th>64ShI2</th>
<th>66CaT1</th>
</tr>
</thead>
<tbody>
<tr>
<td>24</td>
<td>23.9850450</td>
<td>78.60 (4)</td>
<td>78.907 (36)$^C$</td>
<td>78.945 (40)$^C$</td>
<td>78.992 (25)</td>
</tr>
<tr>
<td>26</td>
<td>25.9825954</td>
<td>11.31 (4)</td>
<td>11.034 (22)$^C$</td>
<td>11.026 (28)$^C$</td>
<td>11.005 (19)</td>
</tr>
<tr>
<td>Isotope ratio 25/24</td>
<td>26/24</td>
<td>.1291</td>
<td>.12748 (5)</td>
<td>.12704 (5)</td>
<td>.12663 (13)</td>
</tr>
<tr>
<td>Atomic weight</td>
<td>24.3123 (7)</td>
<td>24.3061 (5)</td>
<td>24.3057 (6)</td>
<td>24.3050 (4)</td>
<td></td>
</tr>
<tr>
<td>Error</td>
<td>NS</td>
<td>NS</td>
<td>NS</td>
<td>3XSD</td>
<td></td>
</tr>
<tr>
<td>Annotation</td>
<td>C, B</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Mass no.</th>
<th>Nuclidic mass</th>
<th>67TAK1</th>
<th>70SCH1</th>
<th>74LEE1</th>
<th>77LEE1</th>
</tr>
</thead>
<tbody>
<tr>
<td>24</td>
<td>23.9850450</td>
<td>79.12 (8)$^C$</td>
<td>78.962 (20)$^C$</td>
<td>74.963 (20)$^C$</td>
<td>78.962 (20)$^C$</td>
</tr>
<tr>
<td>Isotope ratio 25/24, 26/24</td>
<td>0.1261 (8)</td>
<td>0.12663</td>
<td>0.12663 (13)</td>
<td>0.12663 (13)</td>
<td>0.12663 (13)</td>
</tr>
<tr>
<td>Atomic weight</td>
<td>24.329 (1)</td>
<td>24.3056 (3)</td>
<td>24.3056 (3)</td>
<td>24.3056 (3)</td>
<td></td>
</tr>
<tr>
<td>Error</td>
<td>SE</td>
<td>2XSD</td>
<td>2XSE</td>
<td>2XSE</td>
<td></td>
</tr>
<tr>
<td>Annotation</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Mass no.</th>
<th>Nuclidic mass</th>
<th>78SCLAI</th>
<th>83LAI</th>
</tr>
</thead>
<tbody>
<tr>
<td>24</td>
<td>23.9950450</td>
<td>78.962</td>
<td>78.99 (3)</td>
</tr>
<tr>
<td>25</td>
<td>24.9958392</td>
<td>9.999</td>
<td>10.00 (1)</td>
</tr>
<tr>
<td>26</td>
<td>25.9925954</td>
<td>11.039</td>
<td>11.01 (2)</td>
</tr>
<tr>
<td>Isotope ratio 25/24, 26/24</td>
<td>0.12663</td>
<td>0.12660</td>
<td>0.12660</td>
</tr>
<tr>
<td>Atomic weight</td>
<td>24.3056 (3)</td>
<td>24.3051 (5)</td>
<td></td>
</tr>
<tr>
<td>Error</td>
<td>NS</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Annotation</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
### Element 13Al Aluminum

<table>
<thead>
<tr>
<th>Mass no.</th>
<th>Nuclidic mass</th>
<th>56WH1</th>
<th>83ICA1</th>
</tr>
</thead>
<tbody>
<tr>
<td>27</td>
<td>26.9815147</td>
<td>100</td>
<td>100</td>
</tr>
<tr>
<td>Isotope ratio</td>
<td>100</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Atomic weight</td>
<td>26.981541 (4)</td>
<td>26.981541 (4)</td>
<td></td>
</tr>
<tr>
<td>Error</td>
<td>NS</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### Element 14Si Silicon

<table>
<thead>
<tr>
<th>Mass no.</th>
<th>Nuclidic mass</th>
<th>46ING1</th>
<th>46NEY1</th>
<th>46W11</th>
<th>48W11</th>
</tr>
</thead>
<tbody>
<tr>
<td>28</td>
<td>27.9769284</td>
<td>92.28 (8)</td>
<td>92.24 (10)</td>
<td>92.268 (19)C</td>
<td>92.16 (6)</td>
</tr>
<tr>
<td>29</td>
<td>28.9764964</td>
<td>4.67 (5)</td>
<td>4.69 (5)</td>
<td>4.678 (16)C</td>
<td>4.71 (3)</td>
</tr>
<tr>
<td>30</td>
<td>29.9737717</td>
<td>3.05 (5)</td>
<td>3.05 (5)</td>
<td>3.0541 (50)C</td>
<td>3.13 (4)</td>
</tr>
<tr>
<td>Isotope ratio 29/28</td>
<td>0.0506</td>
<td>0.0506</td>
<td>0.0507 (2)</td>
<td>0.0511</td>
<td></td>
</tr>
<tr>
<td></td>
<td>30/28</td>
<td>0.0330</td>
<td>0.0333</td>
<td>0.0331 (1)</td>
<td>0.0340</td>
</tr>
<tr>
<td>Atomic weight</td>
<td>28.084 (1)</td>
<td>28.085 (1)</td>
<td>28.0847 (2)</td>
<td>28.066 (1)</td>
<td></td>
</tr>
<tr>
<td>Error</td>
<td>NS</td>
<td>NS</td>
<td>NS</td>
<td>SE</td>
<td></td>
</tr>
</tbody>
</table>
### Element $^{14}$Si Silicon—continued

<table>
<thead>
<tr>
<th>Mass no.</th>
<th>Nuclidic mass</th>
<th>7SBAR2</th>
<th>83ICA1</th>
</tr>
</thead>
<tbody>
<tr>
<td>28</td>
<td>27.9769284</td>
<td>92.22933 (155)</td>
<td>92.23 (1)</td>
</tr>
<tr>
<td>29</td>
<td>28.9764964</td>
<td>4.66982 (124)</td>
<td>4.67 (1)</td>
</tr>
<tr>
<td>30</td>
<td>29.9757717</td>
<td>3.10608 (74)</td>
<td>3.10 (1)</td>
</tr>
<tr>
<td>Isotope ratio 29/28</td>
<td>0.050633</td>
<td>0.05063</td>
<td></td>
</tr>
<tr>
<td>30/28</td>
<td>0.033621</td>
<td>0.03361</td>
<td></td>
</tr>
<tr>
<td>Atomic weight</td>
<td>28.00555 (2)</td>
<td>28.00555 (2)</td>
<td></td>
</tr>
<tr>
<td>Error</td>
<td>3XSD</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Annotation</td>
<td>C, B</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### Element $^{15}$P Phosphorus

<table>
<thead>
<tr>
<th>Mass no.</th>
<th>Nuclidic mass</th>
<th>63LE11</th>
<th>83ICA1</th>
</tr>
</thead>
<tbody>
<tr>
<td>31</td>
<td>30.973634</td>
<td>100</td>
<td>100</td>
</tr>
<tr>
<td>Isotope ratio</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Atomic weight</td>
<td>30.97363 (4)</td>
<td>30.97363 (4)</td>
<td></td>
</tr>
<tr>
<td>Error</td>
<td>NS</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Annotation</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### Element $^{16}$S Sulfur

<table>
<thead>
<tr>
<th>Mass no.</th>
<th>Nuclidic mass</th>
<th>38NIE2</th>
<th>49HER1</th>
<th>49TR01</th>
</tr>
</thead>
<tbody>
<tr>
<td>32</td>
<td>31.9720718</td>
<td>95.061 (83)$^c$</td>
<td>94.84</td>
<td>94.89</td>
</tr>
<tr>
<td>33</td>
<td>32.9714591</td>
<td>0.741 (15)$^c$</td>
<td>0.04</td>
<td>0.799</td>
</tr>
<tr>
<td>34</td>
<td>32.96766774</td>
<td>4.183 (82)$^c$</td>
<td>4.26</td>
<td>4.34</td>
</tr>
<tr>
<td>36</td>
<td>35.9470799</td>
<td>0.01521 (15)$^c$</td>
<td>0.05</td>
<td>0.0136</td>
</tr>
<tr>
<td>Isotope ratio 33/32</td>
<td>0.0078 (2)</td>
<td>0.009</td>
<td>0.006</td>
<td></td>
</tr>
<tr>
<td>34/32</td>
<td>0.044 (1)</td>
<td>0.045</td>
<td>0.0456</td>
<td></td>
</tr>
<tr>
<td>36/32</td>
<td>0.000186 (16)</td>
<td>0.0005</td>
<td>0.0001</td>
<td></td>
</tr>
<tr>
<td>Atomic weight</td>
<td>32.064 (2)</td>
<td>32.0675 (4)</td>
<td>32.0668 (2)</td>
<td></td>
</tr>
<tr>
<td>Error</td>
<td>NS</td>
<td>NS</td>
<td>NS</td>
<td></td>
</tr>
<tr>
<td>Annotation</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

---

### ISOTOPIC ABUNDANCES AND ATOMIC WEIGHS OF THE ELEMENTS

#### Element $^{16}\text{S}$ Sulfur—continued

<table>
<thead>
<tr>
<th>Mass no.</th>
<th>Nuclidic Mass</th>
<th>50HRE1</th>
<th>50MAC1</th>
<th>56BRAL</th>
<th>83ICA1</th>
</tr>
</thead>
<tbody>
<tr>
<td>32</td>
<td>31.9720718</td>
<td>95.00 (3)</td>
<td>95.018</td>
<td>95.0</td>
<td>95.02 (9)</td>
</tr>
<tr>
<td>33</td>
<td>32.9714591</td>
<td>0.74 (2)</td>
<td>0.750</td>
<td>0.760 (4)</td>
<td>0.75 (1)</td>
</tr>
<tr>
<td>34</td>
<td>33.96786774</td>
<td>4.24 (2)</td>
<td>4.215</td>
<td>4.22 (1)</td>
<td>4.21 (8)</td>
</tr>
<tr>
<td>36</td>
<td>35.9670790</td>
<td>0.017 (3)</td>
<td>0.017</td>
<td>0.014</td>
<td>0.02 (1)</td>
</tr>
<tr>
<td>Isotope ratio 33/32</td>
<td>0.0078</td>
<td>0.0079</td>
<td>0.008</td>
<td>0.008</td>
<td></td>
</tr>
<tr>
<td>34/32</td>
<td>0.0446</td>
<td>0.0444</td>
<td>0.044</td>
<td>0.0002</td>
<td></td>
</tr>
<tr>
<td>26/32</td>
<td>0.00010</td>
<td>0.00010</td>
<td>0.0001</td>
<td>0.0002</td>
<td></td>
</tr>
<tr>
<td>Atomic weight</td>
<td>32.0648 (4)</td>
<td>32.06437 (4)</td>
<td>32.0663 (2)</td>
<td>32.064 (2)</td>
<td></td>
</tr>
<tr>
<td>Error</td>
<td>SD</td>
<td>P</td>
<td>NS</td>
<td>N/A</td>
<td></td>
</tr>
<tr>
<td>Annotation</td>
<td>B</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

#### Element $^{35}\text{Cl}$ Chlorine

<table>
<thead>
<tr>
<th>Mass no.</th>
<th>Nuclidic mass</th>
<th>36NIE1</th>
<th>55BDY1</th>
<th>550WE1</th>
<th>61MEY1</th>
</tr>
</thead>
<tbody>
<tr>
<td>35</td>
<td>34.968852729</td>
<td>75.4 (2) $^c$</td>
<td>75.529 (16)</td>
<td>75.79 (18) $^c$</td>
<td>75.80 (6)</td>
</tr>
<tr>
<td>37</td>
<td>36.965902624</td>
<td>24.6 (2) $^c$</td>
<td>24.471 (16)</td>
<td>24.21 (18) $^c$</td>
<td>24.20 (6)</td>
</tr>
<tr>
<td>Isotope ratio 35/37</td>
<td>3.07 (3)</td>
<td>3.0665 (27)</td>
<td>3.13 (3)</td>
<td>3.132</td>
<td></td>
</tr>
<tr>
<td>Atomic weight</td>
<td>35.460 (4)</td>
<td>35.4575 (3)</td>
<td>35.452 (4)</td>
<td>35.452 (1)</td>
<td></td>
</tr>
<tr>
<td>Error</td>
<td>NS</td>
<td>SD</td>
<td>NS</td>
<td>SE</td>
<td></td>
</tr>
<tr>
<td>Annotation</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Mass no.</th>
<th>Nuclidic mass</th>
<th>62SHI2</th>
<th>83ICA1</th>
</tr>
</thead>
<tbody>
<tr>
<td>35</td>
<td>34.968852729</td>
<td>75.7705 (450)</td>
<td>75.77 (5)</td>
</tr>
<tr>
<td>37</td>
<td>36.965902624</td>
<td>24.2295 (450)</td>
<td>24.23 (5)</td>
</tr>
<tr>
<td>Isotope ratio 35/37</td>
<td>3.1272</td>
<td>0.0079 -0.0082</td>
<td>3.1271</td>
</tr>
<tr>
<td>Atomic weight</td>
<td>35.4527 (9)</td>
<td>35.453 (1)</td>
<td></td>
</tr>
<tr>
<td>Error</td>
<td>3XSD</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Annotation</td>
<td>C,B</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

---

## Element $^{19}$Ar Argon

<table>
<thead>
<tr>
<th>Mass no.</th>
<th>Nuclidic mass</th>
<th>47DIBI</th>
<th>50NIE1</th>
<th>50NIE1</th>
<th>71MEL1</th>
</tr>
</thead>
<tbody>
<tr>
<td>36</td>
<td>35.967545605</td>
<td>0.33 (1)</td>
<td>0.33049 (60)</td>
<td>0.33367 (60)</td>
<td>0.339 (1)</td>
</tr>
<tr>
<td>38</td>
<td>37.9627322</td>
<td>0.08 (1)</td>
<td>0.06325 (10)</td>
<td>0.06275 (10)</td>
<td>0.064 (1)</td>
</tr>
<tr>
<td>40</td>
<td>39.9623631</td>
<td>99.57 (3)</td>
<td>99.60300 (60)</td>
<td>99.60397 (60)</td>
<td>99.597 (1)</td>
</tr>
</tbody>
</table>

Isotope ratio 36/40: 0.00004, 0.000378 (6), 0.000635 (1), 0.000346 (6), 0.00340. Atomic weight: 39.96600 (1) (for air only). Error: SD, P, NS. Annotation: C, B, C.

## Element $^{19}$K Potassium

<table>
<thead>
<tr>
<th>Mass no.</th>
<th>Nuclidic mass</th>
<th>35BREI</th>
<th>35NIE1</th>
<th>40NIE1</th>
<th>50NIE1</th>
</tr>
</thead>
<tbody>
<tr>
<td>36</td>
<td>39.102</td>
<td>0.33 (1)</td>
<td>0.33110 (7)</td>
<td>0.33110 (7)</td>
<td>0.33110 (4)</td>
</tr>
<tr>
<td>38</td>
<td>39.962998</td>
<td>0.012 (2)</td>
<td>0.0108 (11)</td>
<td>0.010 (2)</td>
<td>0.0119 (1)</td>
</tr>
<tr>
<td>40</td>
<td>40.9618254</td>
<td>6.56 (2)</td>
<td>6.68 (1)</td>
<td>6.75 (7)</td>
<td>6.91 (4)</td>
</tr>
</tbody>
</table>

### ISOTOPIC ABUNDANCES AND ATOMIC WEIGHTS OF THE ELEMENTS

#### Element $^{19}$K Potassium—continued

<table>
<thead>
<tr>
<th>Mass no.</th>
<th>Nuclidic mass</th>
<th>$^{2}$REUI</th>
<th>$^{5}$REUI</th>
<th>$^{5}$WHII</th>
<th>$^{6}$OKENT</th>
</tr>
</thead>
<tbody>
<tr>
<td>39</td>
<td>38.9637079</td>
<td>93.462 (21)$^C$</td>
<td>93.126 (42)$^C$</td>
<td>93.23 (5)</td>
<td>93.219 (14)$^C$</td>
</tr>
<tr>
<td>40</td>
<td>39.9639988</td>
<td>0.0118 (1)</td>
<td>0.011730 (47)$^C$</td>
<td>0.0118 (2)</td>
<td>0.011750 (65)$^C$</td>
</tr>
<tr>
<td>Isotope ratio 39/41</td>
<td>14.32 (5)</td>
<td>15.57 (9)</td>
<td>13.79</td>
<td>13.77 (3)</td>
<td></td>
</tr>
<tr>
<td>40/41</td>
<td>0.00181 (1)</td>
<td>0.001710 (2)</td>
<td>0.00175</td>
<td>0.00174 (1)</td>
<td></td>
</tr>
<tr>
<td>Atomic weight</td>
<td>39.0939 (4)</td>
<td>39.1009 (8)</td>
<td>39.099 (1)</td>
<td>39.0991 (3)</td>
<td></td>
</tr>
<tr>
<td>Error</td>
<td>SE</td>
<td>P</td>
<td>NS</td>
<td>P</td>
<td></td>
</tr>
<tr>
<td>Annotation</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Mass no.</th>
<th>Nuclidic mass</th>
<th>$^{6}$GUMUI</th>
<th>$^{6}$HARI</th>
<th>$^{6}$STATI</th>
<th>$^{6}$SHII</th>
</tr>
</thead>
<tbody>
<tr>
<td>39</td>
<td>38.9637079</td>
<td>93.19 (2)</td>
<td>93.46 (5)</td>
<td>93.423 (43)$^C$</td>
<td>93.28 (10)</td>
</tr>
<tr>
<td>40</td>
<td>39.9639988</td>
<td>0.011 (1)</td>
<td>0.0115 (1)</td>
<td>0.01162 (6)$^C$</td>
<td>0.0117 (2)</td>
</tr>
<tr>
<td>41</td>
<td>40.9618254</td>
<td>6.78 (2)</td>
<td>6.52 (6)</td>
<td>6.565 (43)$^C$</td>
<td>6.70 (8)</td>
</tr>
<tr>
<td>Isotope ratio 39/41</td>
<td>13.74</td>
<td>14.33</td>
<td>14.23 (10)</td>
<td>13.92</td>
<td></td>
</tr>
<tr>
<td>40/41</td>
<td>0.001622</td>
<td>0.00176</td>
<td>0.00177 (2)</td>
<td>0.001746</td>
<td></td>
</tr>
<tr>
<td>Atomic weight</td>
<td>39.0953 (4)</td>
<td>39.099 (1)</td>
<td>39.094 (8)</td>
<td>39.09 (2)</td>
<td></td>
</tr>
<tr>
<td>Error</td>
<td>NS</td>
<td>NS</td>
<td>NS</td>
<td>SD</td>
<td></td>
</tr>
<tr>
<td>Annotation</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Mass no.</th>
<th>Nuclidic mass</th>
<th>$^{7}$GARII</th>
<th>$^{7}$SMAI</th>
<th>$^{8}$IMA1</th>
<th>$^{8}$IICS</th>
</tr>
</thead>
<tbody>
<tr>
<td>39</td>
<td>38.9637079</td>
<td>93.2581 (29)</td>
<td>93.29 (10)$^C$</td>
<td>93.27 (30)$^C$</td>
<td>93.2581 (30)</td>
</tr>
<tr>
<td>40</td>
<td>39.9639988</td>
<td>0.01167 (4)</td>
<td>0.0131 (2)$^C$</td>
<td>0.01157 (6)$^C$</td>
<td>0.0117 (1)</td>
</tr>
<tr>
<td>41</td>
<td>40.9618254</td>
<td>6.7302 (29)</td>
<td>6.69 (8)$^C$</td>
<td>6.72 (3)$^C$</td>
<td>6.7302 (30)</td>
</tr>
<tr>
<td>Isotope ratio 39/41</td>
<td>13.8566 (63)</td>
<td>13.94 (2)</td>
<td>13.877 (45)</td>
<td>13.857</td>
<td></td>
</tr>
<tr>
<td>40/41</td>
<td>0.001734 (41)</td>
<td>0.001686 (57)</td>
<td>0.001722 (9)</td>
<td>0.001730</td>
<td></td>
</tr>
<tr>
<td>Atomic weight</td>
<td>39.09829 (6)</td>
<td>39.095 (2)</td>
<td>39.098 (4)</td>
<td>39.09830 (6)</td>
<td></td>
</tr>
<tr>
<td>Error</td>
<td>3xSD</td>
<td>SD</td>
<td>SD</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Annotation</td>
<td>C, B</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
### Element \( \text{Ca} \) Calcium

<table>
<thead>
<tr>
<th>Mass no.</th>
<th>Nuclidic mass</th>
<th>38NIE2</th>
<th>48NH11</th>
<th>60MO11</th>
<th>62ST11</th>
</tr>
</thead>
<tbody>
<tr>
<td>40</td>
<td>39.9625907</td>
<td>90.391 (60)</td>
<td>90.52 (5)</td>
<td>90.09 (4)</td>
<td>90.339 (13)</td>
</tr>
<tr>
<td>42</td>
<td>41.9566218</td>
<td>0.640 (19)</td>
<td>0.64 (1)</td>
<td>0.66 (1)</td>
<td>0.6485 (41)</td>
</tr>
<tr>
<td>43</td>
<td>42.9587704</td>
<td>0.1454 (48)</td>
<td>0.132 (4)</td>
<td>0.16 (1)</td>
<td>0.13280 (69)</td>
</tr>
<tr>
<td>44</td>
<td>43.9554848</td>
<td>2.065 (57)</td>
<td>2.13 (4)</td>
<td>2.03 (1)</td>
<td>2.0718 (86)</td>
</tr>
<tr>
<td>46</td>
<td>45.953689</td>
<td>0.00330 (48)</td>
<td>0.0032</td>
<td>0.0023 (2)</td>
<td>0.003160 (34)</td>
</tr>
<tr>
<td>48</td>
<td>47.952532</td>
<td>0.1852 (58)</td>
<td>0.179 (1)</td>
<td>0.23 (2)</td>
<td>0.1850 (11)</td>
</tr>
<tr>
<td>Isotope ratio 40/44</td>
<td>46.954</td>
<td>45.50</td>
<td>47.73</td>
<td>46.8 (2)</td>
<td></td>
</tr>
<tr>
<td>42/44</td>
<td>0.310</td>
<td>0.30</td>
<td>0.325</td>
<td>0.313 (1.5)</td>
<td></td>
</tr>
<tr>
<td>43/44</td>
<td>0.004</td>
<td>0.0087</td>
<td>0.0013</td>
<td>0.00152 (1.5)</td>
<td></td>
</tr>
<tr>
<td>46/44</td>
<td>0.00016</td>
<td>0.0015</td>
<td>0.0013</td>
<td>0.00152 (1.5)</td>
<td></td>
</tr>
<tr>
<td>48/44</td>
<td>0.090</td>
<td>0.113</td>
<td>0.0893</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Atomic weight</td>
<td>40.077 (2)</td>
<td>40.079 (2)</td>
<td>40.081 (2)</td>
<td>40.0773 (3)</td>
<td></td>
</tr>
<tr>
<td>Error</td>
<td>NS</td>
<td>SD</td>
<td>NS</td>
<td>NS</td>
<td></td>
</tr>
</tbody>
</table>

### Element \( \text{Ca} \) Calcium

<table>
<thead>
<tr>
<th>Mass no.</th>
<th>Nuclidic mass</th>
<th>64BAC1</th>
<th>68SH11</th>
<th>71COL1</th>
<th>72MO1</th>
</tr>
</thead>
<tbody>
<tr>
<td>40</td>
<td>39.9625907</td>
<td>96.86 (5)</td>
<td>96.87 (99)</td>
<td>96.8918 (200)</td>
<td>96.941 (1)</td>
</tr>
<tr>
<td>42</td>
<td>41.9566218</td>
<td>0.655 (6)</td>
<td>0.660 (8)</td>
<td>0.6662 (19)</td>
<td>0.647 (1)</td>
</tr>
<tr>
<td>43</td>
<td>42.9587704</td>
<td>0.138 (2)</td>
<td>0.136 (2)</td>
<td>0.1312 (13)</td>
<td>0.135 (1)</td>
</tr>
<tr>
<td>44</td>
<td>43.9554848</td>
<td>2.12 (4)</td>
<td>2.133 (4)</td>
<td>2.1202 (5)</td>
<td>2.066 (1)</td>
</tr>
<tr>
<td>46</td>
<td>45.963689</td>
<td>0.0046 (10)</td>
<td>0.0004 (1)</td>
<td>0.0004 (4)</td>
<td>0.004 (1)</td>
</tr>
<tr>
<td>48</td>
<td>47.952532</td>
<td>0.200 (6)</td>
<td>0.199 (3)</td>
<td>0.1972 (40)</td>
<td>0.187 (1)</td>
</tr>
<tr>
<td>Isotope ratio 40/44</td>
<td>45.70</td>
<td>45.41 (60)</td>
<td>45.70</td>
<td>45.848 (87)</td>
<td></td>
</tr>
<tr>
<td>42/44</td>
<td>0.309</td>
<td>0.3096 (37)</td>
<td>0.3099 (9)</td>
<td>0.3104 (11)</td>
<td></td>
</tr>
<tr>
<td>43/44</td>
<td>0.065</td>
<td>0.0637 (9)</td>
<td>0.0619 (6)</td>
<td>0.0648 (9)</td>
<td></td>
</tr>
<tr>
<td>46/44</td>
<td>0.002</td>
<td>0.00160 (2)</td>
<td>0.0016 (2)</td>
<td>0.0017 (5)</td>
<td></td>
</tr>
<tr>
<td>48/44</td>
<td>0.094</td>
<td>0.0935 (12)</td>
<td>0.093 (2)</td>
<td>0.0898 (6)</td>
<td></td>
</tr>
<tr>
<td>Atomic Weight</td>
<td>40.080 (2)</td>
<td>40.081 (1)</td>
<td>40.0802 (3)</td>
<td>40.0780 (1)</td>
<td></td>
</tr>
<tr>
<td>Error</td>
<td>SD</td>
<td>SD</td>
<td>NS</td>
<td>2XSD</td>
<td></td>
</tr>
</tbody>
</table>

**Annotation**
### ISOTOPIC ABUNDANCES AND ATOMIC WEIGHS OF THE ELEMENTS

#### Element 20Ca Calcium--continued

<table>
<thead>
<tr>
<th>Mass no.</th>
<th>Nuclidic mass</th>
<th>7BRUS1</th>
<th>8OROS1</th>
<th>83ICA1</th>
</tr>
</thead>
<tbody>
<tr>
<td>40</td>
<td>39.9625907</td>
<td>96.98213 (617)$^C$</td>
<td>96.980 (1)</td>
<td>96.941 (13)</td>
</tr>
<tr>
<td>42</td>
<td>41.9586218</td>
<td>0.64214 (4)$^C$</td>
<td>0.646 (1)</td>
<td>0.647 (3)</td>
</tr>
<tr>
<td>43</td>
<td>42.9587704</td>
<td>0.13340 (2)$^C$</td>
<td>0.135 (1)</td>
<td>0.135 (3)</td>
</tr>
<tr>
<td>44</td>
<td>43.9554848</td>
<td>2.05675 (13)$^C$</td>
<td>2.095 (1)</td>
<td>2.086 (5)</td>
</tr>
<tr>
<td>46</td>
<td>45.953689</td>
<td>0.00313 (2)$^C$</td>
<td>0.003 (1)</td>
<td>0.004 (3)</td>
</tr>
<tr>
<td>48</td>
<td>47.9564546$^C$</td>
<td>0.13640 (4)$^C$</td>
<td>0.139 (1)</td>
<td>0.139 (3)</td>
</tr>
</tbody>
</table>

Isotope ratio 40/44

<table>
<thead>
<tr>
<th>Isotope ratio 40/44</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>40/44</td>
<td>47.153 (3)</td>
</tr>
<tr>
<td>42/44</td>
<td>0.31221 (2)</td>
</tr>
<tr>
<td>43/44</td>
<td>0.06486 (1)</td>
</tr>
<tr>
<td>46/44</td>
<td>0.00152 (1)</td>
</tr>
<tr>
<td>48/44</td>
<td>0.08671 (2)</td>
</tr>
</tbody>
</table>

Atomic weight

<table>
<thead>
<tr>
<th>Atomic weight (g/mol)</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>40.07629 (1)</td>
<td></td>
</tr>
<tr>
<td>40.0785 (1)</td>
<td></td>
</tr>
<tr>
<td>40.0780 (4)</td>
<td></td>
</tr>
</tbody>
</table>

Error

<table>
<thead>
<tr>
<th>Error</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>2XSE</td>
<td></td>
</tr>
<tr>
<td>2XSD</td>
<td></td>
</tr>
</tbody>
</table>

Annotation

---

#### Element 21Sc Scandium

<table>
<thead>
<tr>
<th>Mass no.</th>
<th>Nuclidic mass</th>
<th>SLEL1</th>
<th>83IAC1</th>
</tr>
</thead>
<tbody>
<tr>
<td>45</td>
<td>44.9569136</td>
<td>100</td>
<td>100</td>
</tr>
</tbody>
</table>

Isotope ratio

<table>
<thead>
<tr>
<th>Isotope ratio</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
</tr>
</tbody>
</table>

Atomic weight

<table>
<thead>
<tr>
<th>Atomic weight (g/mol)</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>44.955914 (2)</td>
<td></td>
</tr>
<tr>
<td>44.955914 (3)</td>
<td></td>
</tr>
</tbody>
</table>

Error

<table>
<thead>
<tr>
<th>Error</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>NS</td>
<td></td>
</tr>
</tbody>
</table>

Annotation
### Titanium (22Ti)

#### Mass No. 38NeI2 49HER1 49HER1 52MAt1

<table>
<thead>
<tr>
<th>Mass no.</th>
<th>Nuclidic mass</th>
<th>1961 47.90</th>
<th>1969 47.90 (3)</th>
<th>1979 47.88 (3)</th>
</tr>
</thead>
<tbody>
<tr>
<td>46</td>
<td>45.95260327</td>
<td>7.96 (15)C</td>
<td>0.22 (13)</td>
<td>7.92 (7)</td>
</tr>
<tr>
<td>47</td>
<td>46.9517649</td>
<td>7.76 (14)C</td>
<td>7.42 (5)</td>
<td>7.50 (7)</td>
</tr>
<tr>
<td>48</td>
<td>47.9479467</td>
<td>73.45 (20)C</td>
<td>73.38 (11)</td>
<td>73.09 (13)</td>
</tr>
<tr>
<td>49</td>
<td>48.9478705</td>
<td>5.51 (11)C</td>
<td>5.56 (4)</td>
<td>5.90 (13)</td>
</tr>
<tr>
<td>50</td>
<td>49.9447658</td>
<td>5.34 (11)C</td>
<td>5.41 (5)</td>
<td>5.59 (11)</td>
</tr>
<tr>
<td>Isotope ratio 46/48</td>
<td>0.1082 (22)</td>
<td>0.1120</td>
<td>0.1084</td>
<td>0.1065</td>
</tr>
<tr>
<td></td>
<td>47/48</td>
<td>0.1056 (21)</td>
<td>0.1011</td>
<td>0.1026</td>
</tr>
<tr>
<td></td>
<td>49/48</td>
<td>0.0750 (15)</td>
<td>0.0758</td>
<td>0.0807</td>
</tr>
<tr>
<td></td>
<td>50/48</td>
<td>0.0727 (14)</td>
<td>0.0737</td>
<td>0.0765</td>
</tr>
<tr>
<td>Atomic weight</td>
<td>47.873 (4)</td>
<td>47.874 (3)</td>
<td>47.886 (3)</td>
<td>47.8827 (3)</td>
</tr>
<tr>
<td>Error</td>
<td>P</td>
<td>2XSD</td>
<td>2XSD</td>
<td>NS</td>
</tr>
</tbody>
</table>

**Annotation**

| Mass no. | Nuclidic mass | 54HOG1 58BRA1 68BEl1 68BMA1 79HEY1 |
|----------|---------------|-----------------|-----------------|-----------------|-----------------|
| 46       | 45.9526327    | 7.99 (2)       | 8.00 (5)       | 8.24 (45)      | 8.01 (5)C       | 8.0242 (27)    |
| 47       | 46.9517649    | 7.32 (2)       | 7.29 (4)       | 7.44 (22)      | 7.34 (4)C       | 7.3362 (27)    |
| 48       | 47.9479467    | 73.99 (7)      | 73.98 (8)      | 73.71 (18)     | 73.80 (8)C      | 73.8066 (110)  |
| 49       | 48.9478705    | 5.46 (2)       | 5.38 (5)       | 5.43 (16)      | 5.40 (3)C       | 5.4912 (27)    |
| 50       | 49.9447658    | 5.25 (5)       | 5.35 (4)       | 5.18 (31)      | 5.36 (3)C       | 5.3418 (27)    |
| Isotope ratio 46/48 | 0.1080         | 0.1081         | 0.1118         | 0.10858        | 0.10872 (4)     |
|           | 0.0969        | 0.0969         | 0.1009         | 0.09943        | 0.09940 (5)     |
|           | 0.0738        | 0.0727         | 0.0737         | 0.07442        | 0.07440 (5)     |
|           | 0.0712        | 0.0723         | 0.0703         | 0.07258 (38)   | 0.07238 (5)     |
| Atomic weight | 47 R7F (1)     | 47 R7F (1)     | 47 R7 (1)      | 47 R77 (1)     | 47 R799 (9)     |
| Error     | SD            | SE             | SD             | SD             | 3XSE            |

**Annotation** C, B

---

### Element 22 Ti: Titanium—continued

<table>
<thead>
<tr>
<th>Mass no.</th>
<th>Nuclidic mass</th>
<th>80NiE1</th>
<th>81NiE1</th>
<th>83CaE1</th>
</tr>
</thead>
<tbody>
<tr>
<td>46</td>
<td>45.9526327</td>
<td>8.0124</td>
<td>7.9957</td>
<td>8.0 (1)</td>
</tr>
<tr>
<td>47</td>
<td>46.9517649</td>
<td>7.3309</td>
<td>7.3159</td>
<td>7.3 (1)</td>
</tr>
<tr>
<td>48</td>
<td>47.9479467</td>
<td>73.8145</td>
<td>73.6765</td>
<td>73.8 (1)</td>
</tr>
<tr>
<td>49</td>
<td>48.9478705</td>
<td>5.4964</td>
<td>5.5228</td>
<td>5.5 (1)</td>
</tr>
<tr>
<td>50</td>
<td>49.9447658</td>
<td>5.3458</td>
<td>5.4891</td>
<td>5.4 (1)</td>
</tr>
</tbody>
</table>

**Isotope ratio 46/48**
- 0.10649
- 0.09062
- 0.1111

**Isotope ratio 47/48**
- 0.099315 (5)
- 0.09930
- 0.1003

**Isotope ratio 49/48**
- 0.074663 (4)
- 0.07496
- 0.0732

**Isotope ratio 50/48**
- 0.072422 (4)
- 0.07450
- 0.0705

**Atomic weight**
- 47.8675 (1)
- 47.880360 (3)
- 47.878 (3)

**Error**
- 2XSD
- NS

---

### Element 23 V: Vanadium

<table>
<thead>
<tr>
<th>Mass no.</th>
<th>Nuclidic mass</th>
<th>49HES1</th>
<th>49HES1</th>
<th>49HES1</th>
<th>49HES1</th>
</tr>
</thead>
<tbody>
<tr>
<td>50</td>
<td>49.9471613</td>
<td>0.273 (4)</td>
<td>0.27 (3) c</td>
<td>0.27 (3) c</td>
<td>0.255 (4)</td>
</tr>
<tr>
<td>51</td>
<td>50.9439625</td>
<td>99.727 (4)</td>
<td>99.73 (3) c</td>
<td>99.73 (3) c</td>
<td>99.745 (4)</td>
</tr>
</tbody>
</table>

**Isotope ratio 50/51**
- 0.00274 (4)
- 0.00271 (27)
- 0.00268 (26)
- 0.00256 (4)

**Atomic weight**
- 50.94124 (4)
- 50.9413 (3)
- 50.9413 (3)
- 50.94142 (4)

**Error**
- SE
- SE
- SE
- SE

---

### Element 54 Cr: Chromium

<table>
<thead>
<tr>
<th>Mass no.</th>
<th>Nuclidic mass</th>
<th>49HES1</th>
<th>49LEL2</th>
<th>50HES1</th>
<th>56HES1</th>
</tr>
</thead>
<tbody>
<tr>
<td>50</td>
<td>49.9411613</td>
<td>0.263 (50) c</td>
<td>0.23 (1)</td>
<td>0.28 (2)</td>
<td>0.28 (1)</td>
</tr>
<tr>
<td>51</td>
<td>50.9409325</td>
<td>99.747 (50) c</td>
<td>99.77 (1)</td>
<td>99.72 (2)</td>
<td>99.75 (1)</td>
</tr>
</tbody>
</table>

**Isotope ratio 50/51**
- 0.00232 (5)
- 0.00220
- 0.00081
- 0.000251

**Atomic weight**
- 50.94109 (5)
- 50.9417 (1)
- 50.9412 (2)
- 50.9415 (1)

**Error**
- SE
- NS
- 2XSD
- NS
Element \textsuperscript{23}V Vanadium—continued

<table>
<thead>
<tr>
<th>Mass no.</th>
<th>Nuclidic mass</th>
<th>63SVE1</th>
<th>64FLE1</th>
<th>66FLE1</th>
<th>58IMA1</th>
<th>59BAL1</th>
</tr>
</thead>
<tbody>
<tr>
<td>50</td>
<td>49.9471613</td>
<td>0.2497 (12)(^c)</td>
<td>0.2497 (12)(^c)</td>
<td>0.2497 (6)(^c)</td>
<td>.250 (2)(^c)</td>
<td>0.2419 (30)(^c)</td>
</tr>
<tr>
<td>51</td>
<td>50.9439625</td>
<td>99.7503 (12)(^c)</td>
<td>99.7503 (12)(^c)</td>
<td>99.7503 (6)(^c)</td>
<td>99.750 (2)(^c)</td>
<td>99.7581 (30)(^c)</td>
</tr>
<tr>
<td>Isotope ratio 50/51</td>
<td>0.002503 (12)</td>
<td>0.002503 (10)</td>
<td>0.002503 (6)</td>
<td>0.002506 (38)</td>
<td>0.002425 (30)</td>
<td></td>
</tr>
<tr>
<td>Atomic weight</td>
<td>50.94147 (1)</td>
<td>50.94147 (1)</td>
<td>50.941473 (6)</td>
<td>50.94147 (2)</td>
<td>50.94155 (3)</td>
<td></td>
</tr>
<tr>
<td>Error</td>
<td>NS</td>
<td>SE</td>
<td>SE</td>
<td>SD</td>
<td>NS</td>
<td></td>
</tr>
<tr>
<td>Annotation</td>
<td>C, B</td>
<td>C</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Mass no.</th>
<th>Nuclidic mass</th>
<th>70PEL1</th>
<th>60IMA1</th>
<th>83ICA1</th>
</tr>
</thead>
<tbody>
<tr>
<td>50</td>
<td>49.9471613</td>
<td>0.2444 (17)(^c)</td>
<td>.2500 (3)(^c)</td>
<td>0.250 (2)</td>
</tr>
<tr>
<td>51</td>
<td>50.9439625</td>
<td>99.756 (17)(^e)</td>
<td>99.7500 (3)(^e)</td>
<td>99.750 (2)</td>
</tr>
<tr>
<td>Isotope ratio 50/51</td>
<td>0.002450 (17)</td>
<td>0.002506 (12)</td>
<td>0.002506</td>
<td></td>
</tr>
<tr>
<td>Atomic weight</td>
<td>50.941473 (2)</td>
<td>50.941470 (3)</td>
<td>50.94147 (2)</td>
<td></td>
</tr>
<tr>
<td>Error</td>
<td>NS</td>
<td>SD</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Annotation</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Element \textsuperscript{24}Cr Chromium

<table>
<thead>
<tr>
<th>Mass no.</th>
<th>Nuclidic mass</th>
<th>39NIE2</th>
<th>48ING4</th>
<th>48WH11</th>
<th>49H182</th>
<th>60FLE1</th>
</tr>
</thead>
<tbody>
<tr>
<td>50</td>
<td>49.9460463</td>
<td>4.49</td>
<td>4.51 (6)</td>
<td>4.31 (4)</td>
<td>4.41 (6)</td>
<td>4.352 (24)</td>
</tr>
<tr>
<td>52</td>
<td>51.9405097</td>
<td>83.78</td>
<td>83.52 (30)</td>
<td>83.76 (14)</td>
<td>83.46 (11)</td>
<td>63.764 (36)</td>
</tr>
<tr>
<td>53</td>
<td>52.9406510</td>
<td>9.43</td>
<td>9.55 (20)</td>
<td>9.55 (9)</td>
<td>9.54 (6)</td>
<td>9.509 (27)</td>
</tr>
<tr>
<td>54</td>
<td>53.9388822</td>
<td>2.30</td>
<td>2.42 (4)</td>
<td>2.38 (2)</td>
<td>2.61 (9)</td>
<td>2.375 (18)</td>
</tr>
<tr>
<td>Isotope ratio 50/52</td>
<td>0.0559</td>
<td>0.0504</td>
<td>0.0313</td>
<td>0.0320</td>
<td>0.0320</td>
<td></td>
</tr>
<tr>
<td>53/52</td>
<td>0.1128</td>
<td>0.1143</td>
<td>0.1140</td>
<td>0.1143</td>
<td>0.1135</td>
<td></td>
</tr>
<tr>
<td>54/52</td>
<td>0.0275</td>
<td>0.0290</td>
<td>0.0284</td>
<td>0.0283</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Atomic weight</td>
<td>51.9912 (3)</td>
<td>51.994 (3)</td>
<td>51.996 (1)</td>
<td>52.00 (2)</td>
<td>51.9959 (3)</td>
<td></td>
</tr>
<tr>
<td>Error</td>
<td>NS</td>
<td>NS</td>
<td>SD</td>
<td>SD</td>
<td>3XSD</td>
<td></td>
</tr>
<tr>
<td>Annotation</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
### ISOTOPIC ABUNDANCES AND ATOMIC WEIGHTS OF THE ELEMENTS

**Element \(^{53}\text{Cr}\) Chromium--continued**

<table>
<thead>
<tr>
<th>Mass no.</th>
<th>Nuclidic Mass</th>
<th>60MU1</th>
<th>62SVE1</th>
<th>66SH11</th>
<th>66SH13</th>
<th>73BAR1</th>
</tr>
</thead>
<tbody>
<tr>
<td>50</td>
<td>49.9460463</td>
<td>4.37 (3)</td>
<td>4.357 (5)</td>
<td>4.3452 (85)</td>
<td>4.354 (15)</td>
<td>4.34 (1)(^c)</td>
</tr>
<tr>
<td>52</td>
<td>51.9405097</td>
<td>83.86 (8)</td>
<td>83.760 (9)</td>
<td>83.7895 (117)</td>
<td>83.803 (32)</td>
<td>83.80 (1)(^c)</td>
</tr>
<tr>
<td>53</td>
<td>52.9406510</td>
<td>9.44 (9)</td>
<td>9.506 (7)</td>
<td>9.506 (110)</td>
<td>9.507 (27)</td>
<td>9.50 (1)(^c)</td>
</tr>
<tr>
<td>54</td>
<td>53.9388822</td>
<td>2.36 (3)</td>
<td>2.375 (5)</td>
<td>2.3647 (48)</td>
<td>2.336 (8)</td>
<td>2.36 (1)(^c)</td>
</tr>
</tbody>
</table>

**Isotope ratio**

- 50/52: 0.0521
- 53/52: 0.1120
- 54/52: 0.0261

**Atomic weight**

- 51.995 (1)
- 51.9962 (2)
- 51.9961 (2)
- 51.9954 (4)
- 51.9961 (3)

**Error**

- NS
- SE
- 3XSD
- 2XSD
- 2XSD

**Annotation**

- C
- C, B

---

**Element \(^{53}\text{Mn}\) Manganese**

<table>
<thead>
<tr>
<th>Mass no.</th>
<th>Nuclidic mass</th>
<th>63LE11</th>
<th>83ICA1</th>
</tr>
</thead>
<tbody>
<tr>
<td>55</td>
<td>54.9380463</td>
<td>100</td>
<td>100</td>
</tr>
</tbody>
</table>

**Isotope ratio**

**Atomic weight**

- 54.93805 (1)
- 54.93805 (1)

**Error**

- NS

**Annotation**
### Element $^{56}$Fe Iron

<table>
<thead>
<tr>
<th>Mass no.</th>
<th>Nuclidic mass</th>
<th>39NIE2</th>
<th>41VAL1</th>
<th>47VAL1</th>
<th>48WH11</th>
</tr>
</thead>
<tbody>
<tr>
<td>54</td>
<td>53.9396121</td>
<td>6.04</td>
<td>5.84</td>
<td>5.81 (1)$^c$</td>
<td>5.81 (1) $^c$</td>
</tr>
<tr>
<td>56</td>
<td>55.9349393</td>
<td>91.57</td>
<td>91.68</td>
<td>91.75 (1)$^c$</td>
<td>91.64 (2)</td>
</tr>
<tr>
<td>57</td>
<td>56.9393967</td>
<td>2.11</td>
<td>2.17</td>
<td>2.15 (1)$^c$</td>
<td>2.21 (1)</td>
</tr>
<tr>
<td>58</td>
<td>57.9332778</td>
<td>0.28</td>
<td>0.31</td>
<td>0.29 (1)$^c$</td>
<td>0.34 (1)</td>
</tr>
</tbody>
</table>

Isotope ratio

<table>
<thead>
<tr>
<th>Mass no.</th>
<th>Nuclidic mass</th>
<th>54/56</th>
<th>57/56</th>
<th>58/56</th>
</tr>
</thead>
<tbody>
<tr>
<td>54</td>
<td>53.9396121</td>
<td>0.066</td>
<td>0.0631</td>
<td>0.0634</td>
</tr>
<tr>
<td>56</td>
<td>55.9349393</td>
<td>0.023</td>
<td>0.0237</td>
<td>0.0234</td>
</tr>
<tr>
<td>57</td>
<td>56.9393967</td>
<td>0.003</td>
<td>0.0034</td>
<td>0.0032</td>
</tr>
</tbody>
</table>

Atomic weight

<table>
<thead>
<tr>
<th>Mass no.</th>
<th>Nuclidic mass</th>
<th>55.8411 (3)</th>
<th>55.8463 (3)</th>
<th>55.8463 (3)</th>
<th>55.8479 (3)</th>
</tr>
</thead>
</table>

Error

<table>
<thead>
<tr>
<th>Mass no.</th>
<th>Nuclidic mass</th>
<th>49H1B2</th>
<th>64CHE2</th>
<th>65SH12</th>
<th>65SH12</th>
<th>83ICA1</th>
</tr>
</thead>
<tbody>
<tr>
<td>54</td>
<td>53.9396121</td>
<td>5.903 (15)</td>
<td>5.83 (6)</td>
<td>5.773 (61)$^c$</td>
<td>5.818 (52)$^c$</td>
<td>5.8 (1)</td>
</tr>
<tr>
<td>56</td>
<td>55.9349393</td>
<td>91.52 (2)</td>
<td>91.75 (5)</td>
<td>91.785 (65)$^c$</td>
<td>91.760 (54)$^c$</td>
<td>91.72 (30)</td>
</tr>
<tr>
<td>57/56</td>
<td>65.932967</td>
<td>0.045 (11)</td>
<td>0.14 (6)</td>
<td>0.129 (2)</td>
<td>0.122 (10)$^c$</td>
<td>0.12 (1)</td>
</tr>
<tr>
<td>58/56</td>
<td>57.9332778</td>
<td>0.335 (3)</td>
<td>0.28 (1)</td>
<td>0.3029 (2)$^c$</td>
<td>0.2936 (92)$^c$</td>
<td>0.28 (1)</td>
</tr>
</tbody>
</table>

Isotope ratio

<table>
<thead>
<tr>
<th>Mass no.</th>
<th>Nuclidic mass</th>
<th>54/56</th>
<th>57/56</th>
<th>58/56</th>
</tr>
</thead>
<tbody>
<tr>
<td>54</td>
<td>53.9396121</td>
<td>0.0645</td>
<td>0.0635</td>
<td>0.0629 (7)</td>
</tr>
<tr>
<td>56</td>
<td>55.9349393</td>
<td>0.0249</td>
<td>0.0233</td>
<td>0.0233 (3)</td>
</tr>
<tr>
<td>57</td>
<td>56.9393967</td>
<td>0.0037</td>
<td>0.0035</td>
<td>0.0033 (1)</td>
</tr>
</tbody>
</table>

Atomic weight

<table>
<thead>
<tr>
<th>Mass no.</th>
<th>Nuclidic mass</th>
<th>55.8463 (3)</th>
<th>55.846 (1)</th>
<th>55.847 (1)</th>
<th>55.846 (1)</th>
<th>55.847 (3)</th>
</tr>
</thead>
</table>

Error

### Element $^{27}$Co Cobalt

<table>
<thead>
<tr>
<th>Mass no.</th>
<th>Nuclidic mass</th>
<th>63LE11</th>
<th>83ICA1</th>
</tr>
</thead>
<tbody>
<tr>
<td>59</td>
<td>58.9331978</td>
<td>100</td>
<td>100</td>
</tr>
</tbody>
</table>

Isotope ratio

<table>
<thead>
<tr>
<th>Mass no.</th>
<th>Nuclidic mass</th>
<th>59/59</th>
</tr>
</thead>
<tbody>
<tr>
<td>59</td>
<td>58.9331978</td>
<td>1.001</td>
</tr>
</tbody>
</table>

Atomic weight

<table>
<thead>
<tr>
<th>Mass no.</th>
<th>Nuclidic mass</th>
<th>58.93320 (1)</th>
<th>58.93320 (1)</th>
</tr>
</thead>
</table>

Error

Annotation

---

## ISOTOPIC ABUNDANCES AND ATOMIC WEIGHTS OF THE ELEMENTS

### Element: Ni Nickel

<table>
<thead>
<tr>
<th>Mass no.</th>
<th>Nuclidic mass</th>
<th>41STR1</th>
<th>41VAL2</th>
<th>44EWA2</th>
<th>48ING4</th>
</tr>
</thead>
<tbody>
<tr>
<td>58</td>
<td>57.9353471</td>
<td>62.85</td>
<td>67.4</td>
<td>69.16</td>
<td>67.92</td>
</tr>
<tr>
<td>60</td>
<td>59.9307890</td>
<td>29.51</td>
<td>26.7</td>
<td>25.82</td>
<td>26.22</td>
</tr>
<tr>
<td>61</td>
<td>60.9310586</td>
<td>1.70</td>
<td>1.2</td>
<td>0.97</td>
<td>1.16</td>
</tr>
<tr>
<td>62</td>
<td>61.9283454</td>
<td>4.66</td>
<td>3.8</td>
<td>3.28</td>
<td>3.71</td>
</tr>
<tr>
<td>64</td>
<td>63.9279680</td>
<td>1.27</td>
<td>0.88</td>
<td>0.75</td>
<td>0.98</td>
</tr>
</tbody>
</table>

### Isotope ratio 68/60

<table>
<thead>
<tr>
<th>Isotope ratio</th>
<th>68/60</th>
<th>61/60</th>
<th>62/60</th>
<th>64/60</th>
</tr>
</thead>
<tbody>
<tr>
<td>2.133</td>
<td>2.62</td>
<td>0.079</td>
<td>0.044</td>
<td></td>
</tr>
<tr>
<td>0.058</td>
<td>0.045</td>
<td>0.038</td>
<td>0.044</td>
<td></td>
</tr>
<tr>
<td>0.168</td>
<td>0.142</td>
<td>0.127</td>
<td>0.141</td>
<td></td>
</tr>
<tr>
<td>0.043</td>
<td>0.033</td>
<td>0.029</td>
<td>0.037</td>
<td></td>
</tr>
</tbody>
</table>

### Atomic weight

<table>
<thead>
<tr>
<th>Atomic weight</th>
<th>58.84 (2)</th>
<th>58.708 (4)</th>
<th>58.656 (9)</th>
<th>58.700 (2)</th>
</tr>
</thead>
</table>

### Error

<table>
<thead>
<tr>
<th>Error</th>
<th>NS</th>
<th>NS</th>
<th>P</th>
<th>NS</th>
</tr>
</thead>
</table>

### Annotation

---

## ISOTOPIC ABUNDANCES AND ATOMIC WEIGHTS OF THE ELEMENTS

### Element: Ni Nickel

<table>
<thead>
<tr>
<th>Mass no.</th>
<th>Nuclidic mass</th>
<th>48WII1</th>
<th>52MAT1</th>
<th>73BAR1</th>
<th>R0M0R1</th>
</tr>
</thead>
<tbody>
<tr>
<td>58</td>
<td>57.9353471</td>
<td>67.76</td>
<td>68.0</td>
<td>68.274 (1)^C</td>
<td>68.2812</td>
</tr>
<tr>
<td>60</td>
<td>59.9307890</td>
<td>26.16</td>
<td>26.3</td>
<td>26.095 (1)^C</td>
<td>26.0974</td>
</tr>
<tr>
<td>61</td>
<td>60.9310586</td>
<td>1.25</td>
<td>1.13</td>
<td>1.134 (1)^C</td>
<td>1.1295 (8)^C</td>
</tr>
<tr>
<td>62</td>
<td>61.9283464</td>
<td>3.66</td>
<td>3.66</td>
<td>3.593 (1)^C</td>
<td>3.5892 (10)^C</td>
</tr>
<tr>
<td>64</td>
<td>63.9279680</td>
<td>1.16</td>
<td>1.01</td>
<td>0.904 (1)^C</td>
<td>0.9027 (8)^C</td>
</tr>
</tbody>
</table>

### Isotope ratio 58/60

<table>
<thead>
<tr>
<th>Isotope ratio</th>
<th>58/60</th>
<th>61/60</th>
<th>62/60</th>
<th>64/60</th>
</tr>
</thead>
<tbody>
<tr>
<td>2.590</td>
<td>2.586</td>
<td>2.614 (26)</td>
<td>2.614</td>
<td></td>
</tr>
<tr>
<td>0.048</td>
<td>0.043</td>
<td>0.04384 (45)</td>
<td>0.04328 (3)</td>
<td></td>
</tr>
<tr>
<td>0.140</td>
<td>0.139</td>
<td>0.13769 (34)</td>
<td>0.1375 (4)</td>
<td></td>
</tr>
<tr>
<td>0.044</td>
<td>0.038</td>
<td>0.0364 (35)</td>
<td>0.03459 (4)</td>
<td></td>
</tr>
</tbody>
</table>

### Atomic weight

<table>
<thead>
<tr>
<th>Atomic weight</th>
<th>58.71 (1)</th>
<th>58.759 (2)</th>
<th>58.68767 (1)</th>
<th>58.68735 (6)</th>
</tr>
</thead>
</table>

### Error

<table>
<thead>
<tr>
<th>Error</th>
<th>SD</th>
<th>NS</th>
<th>2XS0</th>
<th>NS</th>
</tr>
</thead>
</table>

### Annotation

B

---

### Element $^{29}$Ni Nickel -- continued

<table>
<thead>
<tr>
<th>Mass no.</th>
<th>Nuclidic mass</th>
<th>82SHI1</th>
<th>83CA11</th>
</tr>
</thead>
<tbody>
<tr>
<td>58</td>
<td>57.9353471</td>
<td>68.2803</td>
<td>68.27 (1)</td>
</tr>
<tr>
<td>60</td>
<td>59.9307890</td>
<td>26.0967</td>
<td>26.10 (1)</td>
</tr>
<tr>
<td>61</td>
<td>60.9310606</td>
<td>1.1206</td>
<td>1.12 (1)</td>
</tr>
<tr>
<td>62</td>
<td>61.9283464</td>
<td>3.5878</td>
<td>3.59 (1)</td>
</tr>
<tr>
<td>64</td>
<td>63.9279680</td>
<td>0.9057</td>
<td>0.91 (1)</td>
</tr>
</tbody>
</table>

Isotope ratio 58/60: 2.6164 (1), 2.616 (2)

Isotope ratio 61/60: 0.04328 (1), 0.043 (2)

Isotope ratio 62/60: 0.13746 (1), 0.137 (2)

Isotope ratio 64/60: 0.03471 (1), 0.035 (2)

Atomic weight: 56.987464 (7), 58.688 (1)

Error: NS

### Element $^{29}$Cu Copper

<table>
<thead>
<tr>
<th>Mass no.</th>
<th>Nuclidic mass</th>
<th>44EWA1</th>
<th>47BRO1</th>
<th>47DUC1</th>
<th>47HUL1</th>
</tr>
</thead>
<tbody>
<tr>
<td>63</td>
<td>62.9295992</td>
<td>69.97 (29)</td>
<td>59.09</td>
<td>69.46 (16)</td>
<td>69.078 (38)</td>
</tr>
<tr>
<td>65</td>
<td>64.9277924</td>
<td>30.03 (29)</td>
<td>30.91</td>
<td>30.52 (16)</td>
<td>30.921 (38)</td>
</tr>
</tbody>
</table>

Isotope ratio 63/65: 2.330 (32), 2.235 (17)

Isotope ratio 64/65: 2.235 (32), 2.235 (17)

Atomic weight: 63.530 (6), 63.5472 (2), 63.599 (3), 63.546 (8)

Error: P, NS, P, NS

### Annotation

- For $^{29}$Ni Nickel:
  - Mass numbers: 58, 60, 61, 62, 64
  - Isotope ratios: 58/60, 61/60, 62/60, 64/60
  - Atomic weight: 56.987464 (7), 58.688 (1)
  - Error: NS

- For $^{29}$Cu Copper:
  - Mass numbers: 63, 65
  - Isotope ratios: 63/65
  - Atomic weight: 63.530 (6), 63.5472 (2), 63.599 (3), 63.546 (8)
  - Error: P, NS, P, NS

### ISOTOPIC ABUNDANCES AND ATOMIC WEIGHTS OF THE ELEMENTS

**Element 63Cu Copper--continued**

<table>
<thead>
<tr>
<th>Mass no.</th>
<th>Nuclidic mass</th>
<th>50HIB1</th>
<th>51SOM1</th>
<th>58MAL1</th>
<th>59MAL1</th>
</tr>
</thead>
<tbody>
<tr>
<td>63</td>
<td>62.9295992</td>
<td>68.98 (4)</td>
<td>68.94 (26)</td>
<td>68.992 (19)(^c)</td>
<td>68.799 (19)(^c)</td>
</tr>
<tr>
<td>65</td>
<td>64.9277924</td>
<td>31.02 (4)</td>
<td>31.06 (26)</td>
<td>31.008 (19)(^c)</td>
<td>31.201 (19)(^c)</td>
</tr>
<tr>
<td>Isotope ratio 63/65</td>
<td>2.224</td>
<td>2.220</td>
<td>2.225 (13)</td>
<td>2.205 (13)</td>
<td></td>
</tr>
<tr>
<td>Atomic weight</td>
<td>63.549 (4)</td>
<td>63.550 (2)</td>
<td>63.5492 (4)</td>
<td>63.5531 (4)</td>
<td></td>
</tr>
<tr>
<td>Error</td>
<td>2XSD</td>
<td>NS</td>
<td>2XSD</td>
<td>2XSD</td>
<td></td>
</tr>
<tr>
<td>Annotation</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Mass no.</th>
<th>Nuclidic mass</th>
<th>62WII1</th>
<th>64SHII1</th>
<th>65SHII1</th>
<th>66SIII1</th>
</tr>
</thead>
<tbody>
<tr>
<td>63</td>
<td>62.9295992</td>
<td>69.23 (19)(^c)</td>
<td>69.174 (20)</td>
<td>68.981 (32)</td>
<td>69.244 (31)</td>
</tr>
<tr>
<td>65</td>
<td>64.9277924</td>
<td>30.77 (19)(^c)</td>
<td>30.826 (20)</td>
<td>30.826 (20)</td>
<td>30.788 (21)</td>
</tr>
<tr>
<td>Isotope ratio 63/65</td>
<td>2.25 (2)</td>
<td>2.2440 (2)</td>
<td>2.2238</td>
<td>2.2514</td>
<td></td>
</tr>
<tr>
<td>Atomic weight</td>
<td>63.544 (4)</td>
<td>63.5456 (4)</td>
<td>63.5494 (6)</td>
<td>63.5442 (6)</td>
<td></td>
</tr>
<tr>
<td>Error</td>
<td>NS</td>
<td>3XSD</td>
<td>3XSD</td>
<td>3XSD</td>
<td></td>
</tr>
<tr>
<td>Annotation</td>
<td></td>
<td>C, B</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Mass no.</th>
<th>Nuclidic mass</th>
<th>67XAN1</th>
<th>75MUR1</th>
<th>76MUR1</th>
<th>83ICA1</th>
</tr>
</thead>
<tbody>
<tr>
<td>63</td>
<td>62.9295992</td>
<td>69.325 (98)(^c)</td>
<td>69.51 (20)(^c)</td>
<td>69.164 (40)(^c)</td>
<td>69.17 (2)</td>
</tr>
<tr>
<td>65</td>
<td>64.9277924</td>
<td>30.675 (98)(^c)</td>
<td>30.49 (20)(^c)</td>
<td>30.836 (40)(^c)</td>
<td>30.83 (2)</td>
</tr>
<tr>
<td>Isotope ratio 63/65</td>
<td>2.260 (0)</td>
<td>2.20 (1)</td>
<td>2.243 (5)</td>
<td>2.244</td>
<td></td>
</tr>
<tr>
<td>Atomic weight</td>
<td>63.543 (2)</td>
<td>63.539 (4)</td>
<td>63.5458 (6)</td>
<td>63.5456 (4)</td>
<td></td>
</tr>
<tr>
<td>Error</td>
<td>SD</td>
<td>SD</td>
<td>SD</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Annotation</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

---

<table>
<thead>
<tr>
<th>Mass no.</th>
<th>Nuclidic mass</th>
<th>48HEE2</th>
<th>48HEE2</th>
<th>48GLEE1</th>
<th>48HIB2</th>
</tr>
</thead>
<tbody>
<tr>
<td>64</td>
<td>63.9291454</td>
<td>48.89</td>
<td>48.90</td>
<td>48.89 (17)²</td>
<td>48.87 (10)</td>
</tr>
<tr>
<td>66</td>
<td>65.9260352</td>
<td>27.82</td>
<td>27.82</td>
<td>27.81 (21)²</td>
<td>27.62 (10)</td>
</tr>
<tr>
<td>67</td>
<td>66.921289</td>
<td>4.14</td>
<td>4.11</td>
<td>4.23 (46)²</td>
<td>4.12 (9)</td>
</tr>
<tr>
<td>68</td>
<td>67.9248458</td>
<td>18.54</td>
<td>18.48</td>
<td>18.61 (16)²</td>
<td>18.71 (10)</td>
</tr>
<tr>
<td>70</td>
<td>69.9253249</td>
<td>0.15</td>
<td>0.15</td>
<td>0.15 (100)²</td>
<td>0.17 (1)</td>
</tr>
</tbody>
</table>

**Isotope ratio 64/67**
- 64/67: 11.81 / 11.73 / 12.01 (12) / 11.86
- 66/67: 6.72 / 6.67 / 6.83 (7) / 6.70
- 68/67: 4.48 / 4.43 / 4.57 (5) / 4.54
- 70/67: 0.15 / 0.15 / 0.15 (100)² / 0.17 (1)

**Atomic weight**
- 65.3865 (3) / 65.38156 (3) / 65.387 (5) / 65.393 (3)

**Error**
- NS / NS / P / SD

---

<table>
<thead>
<tr>
<th>Mass no.</th>
<th>Nuclidic mass</th>
<th>59OKA1</th>
<th>72ROS1</th>
<th>83ICA1</th>
</tr>
</thead>
<tbody>
<tr>
<td>64</td>
<td>63.9291454</td>
<td>49.77</td>
<td>48.63 (13)</td>
<td>48.6 (3)</td>
</tr>
<tr>
<td>66</td>
<td>65.9260352</td>
<td>27.19</td>
<td>27.90 (8)</td>
<td>27.9 (2)</td>
</tr>
<tr>
<td>67</td>
<td>66.9271289</td>
<td>4.07</td>
<td>4.10 (3)</td>
<td>4.1 (1)</td>
</tr>
<tr>
<td>68</td>
<td>67.9248458</td>
<td>18.54</td>
<td>18.75 (16)</td>
<td>18.8 (4)</td>
</tr>
<tr>
<td>70</td>
<td>69.9253249</td>
<td>0.41</td>
<td>0.62 (1)</td>
<td>0.6 (1)</td>
</tr>
</tbody>
</table>

**Isotope ratio 64/67**
- 64/67: 12.23 / 11.86 / 11.86
- 66/67: 6.68 / 6.80 / 6.80
- 68/67: 4.56 / 4.57 / 4.58
- 70/67: 0.10 / 0.15 / 0.15

**Atomic weight**
- 66.3586 (b) / 66.3586 (b) / 66.40 (1)

**Error**
- NS / 2XSD

---

**Element ³¹Zn Zinc**

- 1961: 69.72
- 1963: 69.723 (4)

<table>
<thead>
<tr>
<th>Mass no.</th>
<th>Nuclidic mass</th>
<th>48ING3</th>
<th>48ING4</th>
<th>49HIB2</th>
<th>53ANT1</th>
</tr>
</thead>
<tbody>
<tr>
<td>69</td>
<td>68.9255809</td>
<td>60.16 (18)²</td>
<td>60.317 (94)²</td>
<td>60.00 (7)</td>
<td>60.5 (2)</td>
</tr>
<tr>
<td>71</td>
<td>70.9247006</td>
<td>39.84 (18)²</td>
<td>39.583 (94)²</td>
<td>40.00 (5)</td>
<td>39.5 (2)</td>
</tr>
</tbody>
</table>

**Isotope ratio 71/69**
- 71/69: 0.6622 (50) / 0.6579 (26) / 0.6667 / 0.6537 (65)

**Atomic weight**
- 69.722 (4) / 69.719 (2) / 69.725 (1) / 69.715 (4)

**Error**
- P / P / SD / P

**Annotation**
### ISOTOPIC ABUNDANCES AND ATOMIC WEIGHTS OF THE ELEMENTS

#### Element 71 Ga Gallium—continued

<table>
<thead>
<tr>
<th>Mass no.</th>
<th>Nuclidic mass</th>
<th>72LAEI</th>
<th>76LAEI</th>
<th>83ICAI</th>
</tr>
</thead>
<tbody>
<tr>
<td>69</td>
<td>68.9255809</td>
<td>60.093 (18)(^c)</td>
<td>60.078 (108)(^c)</td>
<td>60.1 (2)</td>
</tr>
<tr>
<td>71</td>
<td>70.9247006</td>
<td>39.907 (18)(^c)</td>
<td>39.922 (108)(^c)</td>
<td>39.9 (2)</td>
</tr>
<tr>
<td>Isotope ratio 71/69</td>
<td>0.6641 (5)</td>
<td>0.6645 (30)</td>
<td>0.6639</td>
<td>0.6639</td>
</tr>
<tr>
<td>Atomic weight</td>
<td>69.7234 (4)</td>
<td>69.724 (2)</td>
<td>69.723 (4)</td>
<td>69.723 (4)</td>
</tr>
<tr>
<td>Error</td>
<td>NS</td>
<td>2XSD</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Annotation</td>
<td></td>
<td>c, d</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

#### Element 72 Ge Germanium

<table>
<thead>
<tr>
<th>Mass no.</th>
<th>Nuclidic mass</th>
<th>74HELI</th>
<th>74HELI</th>
<th>74HELI</th>
<th>74HELI</th>
</tr>
</thead>
<tbody>
<tr>
<td>70</td>
<td>69.9242498</td>
<td>20.55 (17)</td>
<td>20.65 (4)</td>
<td>20.60 (6)</td>
<td>20.45 (2)</td>
</tr>
<tr>
<td>72</td>
<td>71.9220800</td>
<td>27.37 (15)</td>
<td>27.43 (2)</td>
<td>27.38 (8)</td>
<td>27.41 (2)</td>
</tr>
<tr>
<td>73</td>
<td>72.9234639</td>
<td>7.67 (4)</td>
<td>7.86 (4)</td>
<td>7.83 (6)</td>
<td>7.77 (1)</td>
</tr>
<tr>
<td>74</td>
<td>73.9211788</td>
<td>36.74 (27)</td>
<td>36.34 (5)</td>
<td>36.40 (10)</td>
<td>36.58 (2)</td>
</tr>
<tr>
<td>76</td>
<td>75.9214027</td>
<td>7.67 (4)</td>
<td>7.72 (1)</td>
<td>7.78 (5)</td>
<td>7.79 (1)</td>
</tr>
<tr>
<td>Isotope ratio 70/73</td>
<td>2.679</td>
<td>2.627</td>
<td>2.631</td>
<td>2.632</td>
<td></td>
</tr>
<tr>
<td>72/73</td>
<td>3.568</td>
<td>3.490</td>
<td>3.497</td>
<td>3.528</td>
<td></td>
</tr>
<tr>
<td>74/73</td>
<td>4.790</td>
<td>4.523</td>
<td>4.649</td>
<td>4.708</td>
<td></td>
</tr>
<tr>
<td>76/73</td>
<td>1.000</td>
<td>0.992</td>
<td>0.994</td>
<td>1.003</td>
<td></td>
</tr>
<tr>
<td>Atomic weight</td>
<td>72.630 (6)</td>
<td>72.623 (1)</td>
<td>72.628 (3)</td>
<td>72.6341 (7)</td>
<td></td>
</tr>
<tr>
<td>Error</td>
<td>NS</td>
<td>SE</td>
<td>SE</td>
<td>SD</td>
<td></td>
</tr>
<tr>
<td>Annotation</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Mass no.</th>
<th>Nuclidic mass</th>
<th>51CRA1</th>
<th>52DIB1</th>
<th>53REY1</th>
<th>63SHI2</th>
</tr>
</thead>
<tbody>
<tr>
<td>70</td>
<td>69.9242498</td>
<td>20.58 (2)</td>
<td>20.64 (20)</td>
<td>20.52 (17)</td>
<td>20.807 (34)(^c)</td>
</tr>
<tr>
<td>72</td>
<td>71.9220800</td>
<td>27.37 (2)</td>
<td>27.50 (30)</td>
<td>27.43 (21)</td>
<td>27.591 (64)(^c)</td>
</tr>
<tr>
<td>73</td>
<td>72.9234639</td>
<td>7.78 (1)</td>
<td>7.76 (8)</td>
<td>7.76 (8)</td>
<td>7.616 (36)(^c)</td>
</tr>
<tr>
<td>74</td>
<td>73.9211788</td>
<td>36.65 (2)</td>
<td>36.43 (30)</td>
<td>36.54 (23)</td>
<td>36.538 (95)(^c)</td>
</tr>
<tr>
<td>76</td>
<td>75.9214027</td>
<td>7.82 (1)</td>
<td>7.71 (8)</td>
<td>7.76 (8)</td>
<td>7.449 (38)(^c)</td>
</tr>
<tr>
<td>Isotope ratio 70/73</td>
<td>2.619</td>
<td>2.674</td>
<td>2.644</td>
<td>2.732</td>
<td></td>
</tr>
<tr>
<td>72/73</td>
<td>3.518</td>
<td>3.562</td>
<td>3.535</td>
<td>3.623</td>
<td></td>
</tr>
<tr>
<td>74/73</td>
<td>4.711</td>
<td>4.719</td>
<td>4.709</td>
<td>4.798</td>
<td></td>
</tr>
<tr>
<td>76/73</td>
<td>1.005</td>
<td>0.999</td>
<td>1.000</td>
<td>0.978</td>
<td></td>
</tr>
<tr>
<td>Atomic weight</td>
<td>72.6382 (7)</td>
<td>72.624 (7)</td>
<td>72.631 (6)</td>
<td>72.611 (2)</td>
<td></td>
</tr>
<tr>
<td>Error</td>
<td>SD</td>
<td>P</td>
<td>P</td>
<td>SD</td>
<td></td>
</tr>
<tr>
<td>Annotation</td>
<td></td>
<td>B</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### Element $^{32}$Ge Germanium—continued

<table>
<thead>
<tr>
<th>Mass no.</th>
<th>Nuclidic mass</th>
<th>63SHI2</th>
<th>63SH12</th>
<th>83ICA1</th>
</tr>
</thead>
<tbody>
<tr>
<td>70</td>
<td>60.9242100</td>
<td>20.92</td>
<td>21.106 (12)$^c$</td>
<td>20.6 (5)</td>
</tr>
<tr>
<td>72</td>
<td>71.9220800</td>
<td>27.58</td>
<td>27.670 (27)$^c$</td>
<td>27.4 (6)</td>
</tr>
<tr>
<td>73</td>
<td>72.9234639</td>
<td>7.76</td>
<td>7.683 (12)$^c$</td>
<td>7.8 (2)</td>
</tr>
<tr>
<td>74</td>
<td>73.9217888</td>
<td>36.20</td>
<td>36.091 (29)$^c$</td>
<td>36.5 (7)</td>
</tr>
<tr>
<td>76</td>
<td>75.9214027</td>
<td>7.51</td>
<td>7.450 (11)$^c$</td>
<td>7.8 (2)</td>
</tr>
<tr>
<td>Isotope ratio 70/73</td>
<td>2.689</td>
<td>2.747</td>
<td>2.63</td>
<td></td>
</tr>
<tr>
<td></td>
<td>72/73</td>
<td>3.545</td>
<td>3.601</td>
<td>3.51</td>
</tr>
<tr>
<td></td>
<td>74/73</td>
<td>4.653</td>
<td>4.698</td>
<td>4.68</td>
</tr>
<tr>
<td></td>
<td>76/73</td>
<td>0.965</td>
<td>0.970</td>
<td>1.00</td>
</tr>
<tr>
<td>Atomic weight</td>
<td>72.6062 (5)</td>
<td>72.5968 (6)</td>
<td>72.63 (2)</td>
<td></td>
</tr>
<tr>
<td>Error</td>
<td>SD</td>
<td>SD</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

---

### Element $^{33}$As Arsenic

<table>
<thead>
<tr>
<th>Mass no.</th>
<th>Nuclidic mass</th>
<th>C6C16</th>
<th>C6C14</th>
</tr>
</thead>
<tbody>
<tr>
<td>75</td>
<td>74.9215965</td>
<td>100</td>
<td>100</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Isotope ratio</th>
</tr>
</thead>
<tbody>
<tr>
<td>Atomic weight</td>
</tr>
<tr>
<td>Error</td>
</tr>
</tbody>
</table>

---

### ISOTOPIC ABUNDANCES AND ATOMIC WEIGHTS OF THE ELEMENTS

#### Element $^{34}\text{Se}$ Selenium

<table>
<thead>
<tr>
<th>Mass no.</th>
<th>Nuclidic mass</th>
<th>$^{48}\text{WHI}$</th>
<th>$^{48}\text{WHII}$</th>
<th>$^{48}\text{WHIII}$</th>
<th>$^{49}\text{WHIB}$</th>
</tr>
</thead>
<tbody>
<tr>
<td>74</td>
<td>73.9224771</td>
<td>0.88 (13)</td>
<td>0.88 (1)</td>
<td>0.87 (1)</td>
<td>0.96 (3)</td>
</tr>
<tr>
<td>76</td>
<td>75.9192066</td>
<td>9.08 (9)</td>
<td>8.95 (3)</td>
<td>9.02 (7)</td>
<td>9.12 (3)</td>
</tr>
<tr>
<td>77</td>
<td>76.9199077</td>
<td>7.81 (75)</td>
<td>7.65 (3)</td>
<td>7.58 (7)</td>
<td>7.50 (14)</td>
</tr>
<tr>
<td>78</td>
<td>77.9173040</td>
<td>23.54 (24)</td>
<td>23.51 (11)</td>
<td>23.52 (2)</td>
<td>23.61 (5)</td>
</tr>
<tr>
<td>80</td>
<td>79.9165205</td>
<td>50.02 (50)</td>
<td>49.62 (14)</td>
<td>49.82 (20)</td>
<td>49.96 (21)</td>
</tr>
<tr>
<td>82</td>
<td>81.9167069</td>
<td>8.99 (8)</td>
<td>9.39 (9)</td>
<td>9.19 (20)</td>
<td>8.84 (8)</td>
</tr>
<tr>
<td>Isotope ratio 74/78</td>
<td>0.037</td>
<td>0.037</td>
<td>0.037</td>
<td>0.041</td>
<td></td>
</tr>
<tr>
<td>76/78</td>
<td>0.386</td>
<td>0.381</td>
<td>0.384</td>
<td>0.386</td>
<td></td>
</tr>
<tr>
<td>77/78</td>
<td>0.319</td>
<td>0.325</td>
<td>0.322</td>
<td>0.318</td>
<td></td>
</tr>
<tr>
<td>80/78</td>
<td>2.125</td>
<td>2.111</td>
<td>2.118</td>
<td>2.116</td>
<td></td>
</tr>
<tr>
<td>82/78</td>
<td>0.382</td>
<td>0.391</td>
<td>0.391</td>
<td>0.374</td>
<td></td>
</tr>
<tr>
<td>Atomic weight</td>
<td>78.99 (2)</td>
<td>78.995 (3)</td>
<td>78.990 (7)</td>
<td>78.974 (6)</td>
<td></td>
</tr>
<tr>
<td>Error</td>
<td>SE</td>
<td>SE</td>
<td>SE</td>
<td>SD</td>
<td></td>
</tr>
</tbody>
</table>

#### Mass no. | Nuclidic mass | 83ICA1 |
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>74</td>
<td>73.9224771</td>
<td>0.9 (1)</td>
</tr>
<tr>
<td>76</td>
<td>75.9192066</td>
<td>9.0 (2)</td>
</tr>
<tr>
<td>77</td>
<td>76.9199077</td>
<td>7.6 (2)</td>
</tr>
<tr>
<td>78</td>
<td>77.9173040</td>
<td>23.6 (6)</td>
</tr>
<tr>
<td>80</td>
<td>79.9165205</td>
<td>40.7 (7)</td>
</tr>
<tr>
<td>82</td>
<td>81.9167069</td>
<td>9.2 (5)</td>
</tr>
<tr>
<td>Isotope ratio 74/78</td>
<td>0.038</td>
<td>0.038</td>
</tr>
<tr>
<td>76/78</td>
<td>0.303</td>
<td>0.303</td>
</tr>
<tr>
<td>77/78</td>
<td>0.323</td>
<td>0.323</td>
</tr>
<tr>
<td>80/78</td>
<td>2.111</td>
<td>2.111</td>
</tr>
<tr>
<td>82/78</td>
<td>0.400</td>
<td>0.400</td>
</tr>
</tbody>
</table>

#### Atomic weight
- 78.99 (2)

#### Error

#### Annotation
- B
### Element $^{35}$Br Bromine

<table>
<thead>
<tr>
<th>Mass no.</th>
<th>Nuclidic mass</th>
<th>36B1E1</th>
<th>46W11</th>
<th>46W111</th>
<th>49H1B2</th>
</tr>
</thead>
<tbody>
<tr>
<td>79</td>
<td>78.9183361</td>
<td>50.6 (6)</td>
<td>50.53 (10)(^c)</td>
<td>50.51 (50)</td>
<td>50.57 (7)</td>
</tr>
<tr>
<td>81</td>
<td>80.916290</td>
<td>49.4 (6)</td>
<td>49.47 (10)(^c)</td>
<td>49.49 (50)</td>
<td>49.43 (6)</td>
</tr>
<tr>
<td>Isotope ratio 79/81</td>
<td>1.026 (26)</td>
<td>1.021 (4)</td>
<td>1.021</td>
<td>1.023</td>
<td></td>
</tr>
<tr>
<td>Atomic weight</td>
<td>79.91 (1)</td>
<td>79.907 (2)</td>
<td>79.91 (1)</td>
<td>79.906 (1)</td>
<td></td>
</tr>
<tr>
<td>Error</td>
<td>NS</td>
<td>NS</td>
<td>SD</td>
<td>SD</td>
<td></td>
</tr>
</tbody>
</table>

### Element $^{36}$Kr Krypton

<table>
<thead>
<tr>
<th>Mass no.</th>
<th>Nuclidic mass</th>
<th>55CAM2</th>
<th>64CAT1</th>
<th>83ICA1</th>
</tr>
</thead>
<tbody>
<tr>
<td>79</td>
<td>78.9183361</td>
<td>50.5367 (49)</td>
<td>50.606 (47)</td>
<td>50.69 (5)</td>
</tr>
<tr>
<td>81</td>
<td>80.916290</td>
<td>49.4455 (49)</td>
<td>49.514 (47)</td>
<td>49.51 (5)</td>
</tr>
<tr>
<td>Isotope ratio 79/81</td>
<td>1.0217 (2)</td>
<td>1.02784 (190)</td>
<td>1.028</td>
<td></td>
</tr>
<tr>
<td>Atomic weight</td>
<td>79.9066 (1)</td>
<td>79.9036 (9)</td>
<td>79.904 (1)</td>
<td></td>
</tr>
<tr>
<td>Error</td>
<td>2XSD</td>
<td>3XSD</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Annotation</td>
<td>C, B</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### Element $^{36}$Kr Krypton

<table>
<thead>
<tr>
<th>Mass no.</th>
<th>Nuclidic mass</th>
<th>47DB1</th>
<th>47L0U1</th>
<th>47L0U1</th>
<th>50NIE2</th>
</tr>
</thead>
<tbody>
<tr>
<td>78</td>
<td>77.920397</td>
<td>0.36 (1)</td>
<td>0.343 (3)</td>
<td>0.341 (3)</td>
<td>0.354 (2)</td>
</tr>
<tr>
<td>80</td>
<td>79.916375</td>
<td>2.25 (2)</td>
<td>2.233 (9)</td>
<td>2.223 (2)</td>
<td>2.27 (1)</td>
</tr>
<tr>
<td>82</td>
<td>81.913463</td>
<td>11.57 (4)</td>
<td>11.510 (40)</td>
<td>11.490 (10)</td>
<td>11.56 (2)</td>
</tr>
<tr>
<td>83</td>
<td>82.914134</td>
<td>11.44 (3)</td>
<td>11.490 (30)</td>
<td>11.470 (20)</td>
<td>11.55 (2)</td>
</tr>
<tr>
<td>84</td>
<td>83.9122004</td>
<td>57.14 (3)</td>
<td>57.000 (90)</td>
<td>57.040 (40)</td>
<td>56.90 (10)</td>
</tr>
<tr>
<td>86</td>
<td>85.910614</td>
<td>17.24 (5)</td>
<td>17.420 (30)</td>
<td>17.440 (30)</td>
<td>17.37 (2)</td>
</tr>
<tr>
<td>Isotope ratio 78/84</td>
<td>0.0063</td>
<td>0.0060</td>
<td>0.0060</td>
<td>0.0062</td>
<td></td>
</tr>
<tr>
<td>80/84</td>
<td>0.039</td>
<td>0.039</td>
<td>0.039</td>
<td>0.040</td>
<td></td>
</tr>
<tr>
<td>82/84</td>
<td>0.502</td>
<td>0.202</td>
<td>0.201</td>
<td>0.203</td>
<td></td>
</tr>
<tr>
<td>83/84</td>
<td>0.200</td>
<td>0.202</td>
<td>0.201</td>
<td>0.203</td>
<td></td>
</tr>
<tr>
<td>86/84</td>
<td>0.302</td>
<td>0.306</td>
<td>0.305</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Atomic weight</td>
<td>83.799 (2)</td>
<td>83.805 (1)</td>
<td>83.8069 (7)</td>
<td>83.8006 (7)</td>
<td></td>
</tr>
<tr>
<td>Error</td>
<td>SD</td>
<td>SE</td>
<td>SE</td>
<td>3XP</td>
<td></td>
</tr>
<tr>
<td>Annotation</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
### ISOTOPIC ABUNDANCES AND ATOMIC WEIGHTS OF THE ELEMENTS

#### Element 36 Kr Krypton—continued

<table>
<thead>
<tr>
<th>Mass no.</th>
<th>Nuclidic mass</th>
<th>505CHI</th>
<th>64CLA1</th>
<th>71MELI</th>
</tr>
</thead>
<tbody>
<tr>
<td>78</td>
<td>77.920397</td>
<td>0.353 (1)</td>
<td>0.353 (5)(^C)</td>
<td>0.355 (1)</td>
</tr>
<tr>
<td>80</td>
<td>79.916375</td>
<td>2.29 (1)</td>
<td>2.264 (19)(^C)</td>
<td>2.256 (7)</td>
</tr>
<tr>
<td>82</td>
<td>81.913483</td>
<td>11.58 (1)</td>
<td>11.590 (52)(^C)</td>
<td>11.563 (9)</td>
</tr>
<tr>
<td>83</td>
<td>82.914134</td>
<td>11.51 (2)</td>
<td>11.538 (50)(^C)</td>
<td>11.536 (9)</td>
</tr>
<tr>
<td>84</td>
<td>83.9115064</td>
<td>56.95 (4)</td>
<td>56.929 (60)(^C)</td>
<td>56.982 (10)</td>
</tr>
<tr>
<td>86</td>
<td>85.910614</td>
<td>17.31 (3)</td>
<td>17.205 (50)(^C)</td>
<td>17.316 (9)</td>
</tr>
</tbody>
</table>

**Isotope ratio 78/84**

<table>
<thead>
<tr>
<th>78/84</th>
<th>0.0062</th>
<th>0.0062</th>
<th>0.0062</th>
</tr>
</thead>
<tbody>
<tr>
<td>80/84</td>
<td>0.040</td>
<td>0.040</td>
<td>0.0396</td>
</tr>
<tr>
<td>82/84</td>
<td>0.203</td>
<td>0.204</td>
<td>0.2027</td>
</tr>
<tr>
<td>83/84</td>
<td>0.202</td>
<td>0.203</td>
<td>0.2024</td>
</tr>
<tr>
<td>86/84</td>
<td>0.304</td>
<td>0.304</td>
<td>0.3039</td>
</tr>
</tbody>
</table>

**Atomic weight**

| 83.7986 (8) | 83.800 (2) | 83.8004 (4) |

**Error**

| NS | SD | NS |

### Annotation

<table>
<thead>
<tr>
<th>Mass no.</th>
<th>Nuclidic mass</th>
<th>73WAL1</th>
<th>83ICA1</th>
</tr>
</thead>
<tbody>
<tr>
<td>78</td>
<td>77.920397</td>
<td>0.360 (4)</td>
<td>0.35 (2)</td>
</tr>
<tr>
<td>80</td>
<td>79.916375</td>
<td>2.277 (4)</td>
<td>2.25 (2)</td>
</tr>
<tr>
<td>82</td>
<td>81.913483</td>
<td>11.58 (1)</td>
<td>11.6 (1)</td>
</tr>
<tr>
<td>83</td>
<td>82.914134</td>
<td>11.52 (1)</td>
<td>11.5 (1)</td>
</tr>
<tr>
<td>84</td>
<td>83.9115064</td>
<td>56.96 (1)</td>
<td>57.0 (3)</td>
</tr>
<tr>
<td>86</td>
<td>85.910614</td>
<td>17.30 (1)</td>
<td>17.3 (2)</td>
</tr>
</tbody>
</table>

**Isotope ratio 78/84**

<table>
<thead>
<tr>
<th>78/84</th>
<th>0.0063</th>
<th>0.0061</th>
</tr>
</thead>
<tbody>
<tr>
<td>80/84</td>
<td>0.0400</td>
<td>0.039</td>
</tr>
<tr>
<td>82/84</td>
<td>0.2033</td>
<td>0.203</td>
</tr>
<tr>
<td>83/84</td>
<td>0.2022</td>
<td>0.202</td>
</tr>
<tr>
<td>86/84</td>
<td>0.3037</td>
<td>0.304</td>
</tr>
</tbody>
</table>

**Atomic weight**

| 83.7986 (4) | 83.800 (5) |

**Error**

| P |

### Annotation

| B |
### Element $^{37}\text{Rb}$ Rubidium

<table>
<thead>
<tr>
<th>Mass no.</th>
<th>Nuclidic mass</th>
<th>3BBRE1</th>
<th>48PAU1</th>
<th>50NIE2</th>
<th>50NIE2</th>
</tr>
</thead>
<tbody>
<tr>
<td>85</td>
<td>84.9117996</td>
<td>72.299 (77)$^a$</td>
<td>72.53 (23)$^b$</td>
<td>72.18 (14)$^b$</td>
<td>72.137 (93)$^b$</td>
</tr>
<tr>
<td>87</td>
<td>86.9091836</td>
<td>27.701 (77)$^c$</td>
<td>27.47 (23)$^c$</td>
<td>27.82 (14)$^c$</td>
<td>27.863 (93)$^c$</td>
</tr>
<tr>
<td>Isotope ratio 85/87</td>
<td>0.41 (1)</td>
<td>0.64 (3)</td>
<td>0.225 (6)</td>
<td>0.200 (4)</td>
<td></td>
</tr>
<tr>
<td>Atomic weight</td>
<td>85.465 (2)</td>
<td>85.460 (5)</td>
<td>85.467 (3)</td>
<td>85.468 (2)</td>
<td></td>
</tr>
<tr>
<td>Error</td>
<td>NS</td>
<td>3XSD</td>
<td>P</td>
<td>P</td>
<td></td>
</tr>
</tbody>
</table>

**Annotation**

<table>
<thead>
<tr>
<th>Mass no.</th>
<th>Nuclidic mass</th>
<th>53HER1</th>
<th>56PAC1</th>
<th>60OMUI</th>
<th>63SHII</th>
</tr>
</thead>
<tbody>
<tr>
<td>85</td>
<td>84.9117996</td>
<td>72.153 (23)$^c$</td>
<td>72.603 (75)</td>
<td>72.1 (1)$^c$</td>
<td>72.218 (12)$^c$</td>
</tr>
<tr>
<td>87</td>
<td>86.9091836</td>
<td>27.847 (23)$^c$</td>
<td>27.397 (75)</td>
<td>27.9 (1)$^c$</td>
<td>27.782 (12)$^c$</td>
</tr>
<tr>
<td>Isotope ratio 85/87</td>
<td>2.591 (3)</td>
<td>2.65 (1)</td>
<td>2.58 (1)</td>
<td>2.5995 (15)</td>
<td></td>
</tr>
<tr>
<td>Atomic weight</td>
<td>85.4680 (5)</td>
<td>85.459 (1)</td>
<td>85.469 (2)</td>
<td>85.4667 (2)</td>
<td></td>
</tr>
<tr>
<td>Error</td>
<td>NS</td>
<td>NS</td>
<td>NS</td>
<td>3XSD</td>
<td></td>
</tr>
</tbody>
</table>

**Annotation**

<table>
<thead>
<tr>
<th>Mass no.</th>
<th>Nuclidic mass</th>
<th>62GIII1</th>
<th>63GIII1</th>
<th>G2GAT1</th>
<th>G3GCA1</th>
</tr>
</thead>
<tbody>
<tr>
<td>85</td>
<td>84.9117996</td>
<td>72.243 (38)$^c$</td>
<td>72.183 (38)$^c$</td>
<td>72.1654 (132)</td>
<td>72.165 (13)</td>
</tr>
<tr>
<td>87</td>
<td>86.9091836</td>
<td>27.757 (38)$^c$</td>
<td>27.817 (38)$^c$</td>
<td>27.8346 (132)</td>
<td>27.835 (13)</td>
</tr>
<tr>
<td>Isotope ratio 85/87</td>
<td>2.5027 (49)</td>
<td>2.5949 (49)</td>
<td>2.59265 (170)</td>
<td>2.5926</td>
<td></td>
</tr>
<tr>
<td>Atomic weight</td>
<td>85.4662 (8)</td>
<td>85.4674 (8)</td>
<td>85.4678 (3)</td>
<td>85.4678 (3)</td>
<td></td>
</tr>
<tr>
<td>Error</td>
<td>SD</td>
<td>SD</td>
<td>3XSD</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Annotation** C, B
### ISOTOPIC ABUNDANCES AND ATOMIC WEIGHTS OF THE ELEMENTS

#### Element: Sr (Strontium)

<table>
<thead>
<tr>
<th>Mass no.</th>
<th>Nuclidic mass</th>
<th>38NIEL</th>
<th>48WH11</th>
<th>53ALD1</th>
<th>54HER1</th>
</tr>
</thead>
<tbody>
<tr>
<td>84</td>
<td>83.913428</td>
<td>0.561 (11)^c</td>
<td>0.55 (8)</td>
<td>0.553 (41)</td>
<td>0.471 (56)</td>
</tr>
<tr>
<td>86</td>
<td>85.9092732</td>
<td>9.858 (90)^c</td>
<td>9.75 (10)</td>
<td>9.866 (23)</td>
<td>9.892 (53)</td>
</tr>
<tr>
<td>87</td>
<td>86.9088902</td>
<td>7.018 (66)^c</td>
<td>6.96 (7)</td>
<td>7.018 (31)</td>
<td>6.923 (54)</td>
</tr>
<tr>
<td>88</td>
<td>87.9056249</td>
<td>82.56 (10)^c</td>
<td>12.74 (83)</td>
<td>82.563 (48)</td>
<td>82.713 (83)</td>
</tr>
</tbody>
</table>

**Isotope ratio 84/86**

<table>
<thead>
<tr>
<th></th>
<th>87/86</th>
<th>85/86</th>
</tr>
</thead>
<tbody>
<tr>
<td>84/86</td>
<td>0.057</td>
<td>0.056</td>
</tr>
<tr>
<td>87/86</td>
<td>0.712</td>
<td>0.714</td>
</tr>
<tr>
<td>85/86</td>
<td>8.375</td>
<td>8.466</td>
</tr>
</tbody>
</table>

**Atomic weight**

- 87.617 (2)
- 87.620 (4)
- 87.617 (2)
- 87.620 (2)

**Error**

- P
- P
- SF
- SD

#### Annotation

#### Mass no. | Nuclidic mass | 54HER1 | 54HER1 | 54HER1 | 54HER1 |
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>84</td>
<td>83.913428</td>
<td>0.55</td>
<td>0.56</td>
<td>0.5608 (82)</td>
<td>0.55</td>
</tr>
<tr>
<td>86</td>
<td>85.9092732</td>
<td>9.76</td>
<td>9.81</td>
<td>9.946 (23)</td>
<td>9.91</td>
</tr>
<tr>
<td>87</td>
<td>86.9088902</td>
<td>6.94</td>
<td>6.94</td>
<td>7.019 (31)</td>
<td>7.01</td>
</tr>
<tr>
<td>88</td>
<td>87.9056249</td>
<td>82.75</td>
<td>82.69</td>
<td>82.472 (35)</td>
<td>82.52</td>
</tr>
</tbody>
</table>

**Isotope ratio 84/86**

<table>
<thead>
<tr>
<th></th>
<th>87/86</th>
<th>85/86</th>
</tr>
</thead>
<tbody>
<tr>
<td>84/86</td>
<td>0.056</td>
<td>0.057</td>
</tr>
<tr>
<td>87/86</td>
<td>0.711</td>
<td>0.707</td>
</tr>
<tr>
<td>85/86</td>
<td>8.478</td>
<td>8.429</td>
</tr>
</tbody>
</table>

**Atomic weight**

- 87.6197 (4)
- 87.6183 (4)
- 87.6147 (6)
- 87.6160 (4)

**Error**

- SD
- SD
- sn
- sn

#### Annotation

#### Mass no. | Nuclidic mass | 54HER1 | 56AK11 | 58PIN1 | 58PIN1 |
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>84</td>
<td>83.913428</td>
<td>0.57</td>
<td>0.58 (6)</td>
<td>0.561 (16)</td>
<td>0.561 (16)</td>
</tr>
<tr>
<td>86</td>
<td>85.9092732</td>
<td>9.87</td>
<td>9.99 (2)</td>
<td>9.872 (23)</td>
<td>9.850 (23)</td>
</tr>
<tr>
<td>87</td>
<td>86.9088902</td>
<td>7.01</td>
<td>7.14 (25)</td>
<td>7.029 (25)</td>
<td>7.023 (25)</td>
</tr>
<tr>
<td>88</td>
<td>87.9056249</td>
<td>82.56</td>
<td>82.29 (62)</td>
<td>82.538 (33)</td>
<td>82.565 (33)</td>
</tr>
</tbody>
</table>

**Isotope ratio 84/86**

<table>
<thead>
<tr>
<th></th>
<th>87/86</th>
<th>85/86</th>
</tr>
</thead>
<tbody>
<tr>
<td>84/86</td>
<td>0.058</td>
<td>0.056</td>
</tr>
<tr>
<td>87/86</td>
<td>0.710</td>
<td>0.715</td>
</tr>
<tr>
<td>85/86</td>
<td>8.305</td>
<td>8.253</td>
</tr>
</tbody>
</table>

**Atomic weight**

- 87.6159 (4)
- 87.612 (3)
- 87.6161 (7)
- 87.6166 (7)

**Error**

- sn
- sn
- sn
- sn

#### Annotation

---

DE BIÈVRE ET AL.

Element $^{36}\text{Sr}$ Strontium--continued

<table>
<thead>
<tr>
<th>Mass no.</th>
<th>Nuclidic mass</th>
<th>58PIN1</th>
<th>600MU1</th>
<th>82M001</th>
<th>83ICA1</th>
</tr>
</thead>
<tbody>
<tr>
<td>84</td>
<td>83.913428</td>
<td>0.56</td>
<td>0.60 (1)</td>
<td>0.55738 (155)</td>
<td>0.56 (1)</td>
</tr>
<tr>
<td>86</td>
<td>85.9092732</td>
<td>9.87</td>
<td>9.75 (1)</td>
<td>9.85659 (337)</td>
<td>9.86 (1)</td>
</tr>
<tr>
<td>87</td>
<td>86.9088902</td>
<td>7.01</td>
<td>7.07 (1)</td>
<td>7.00152 (263)</td>
<td>7.00 (1)</td>
</tr>
<tr>
<td>88</td>
<td>87.9056249</td>
<td>82.56</td>
<td>82.58 (3)</td>
<td>82.58451 (657)</td>
<td>82.58 (1)</td>
</tr>
</tbody>
</table>

Isotope ratio 84/86 87/86 20/36 89/90 94/96
|  84/86  | 0.057   | 0.0561 | 0.056549 (143) | 0.0568 |
|  87/86  | 0.7012  | 0.7241 | 0.710339 (261) | 0.7099 |
|  20/36  | 0.909  | 0.905 | 0.90612 (2746) | 0.973 |

Atomic weight 87.6164 (4) 87.6166 (4) 87.616814 (117) 87.6167 (4)

Error SD NS 3XSD

Annotation C, B

Element $^{39}\text{Y}$ Yttrium

<table>
<thead>
<tr>
<th>Mass no.</th>
<th>Nuclidic mass</th>
<th>56HES1</th>
<th>57COL1</th>
<th>83ICA1</th>
</tr>
</thead>
<tbody>
<tr>
<td>89</td>
<td>88.90586560</td>
<td>100</td>
<td>100</td>
<td>100</td>
</tr>
</tbody>
</table>

Isotope ratio

Atomic weight 88.90586 (2) 88.90586 (2) 88.90586 (2)

Error NS NS

Annotation

Element $^{40}\text{Zr}$ Zirconium

<table>
<thead>
<tr>
<th>Mass no.</th>
<th>Nuclidic mass</th>
<th>48LIN1</th>
<th>49LIN1</th>
<th>58ORA1</th>
<th>63MURI</th>
</tr>
</thead>
<tbody>
<tr>
<td>90</td>
<td>89.9047080</td>
<td>51.46 (51)</td>
<td>51.7</td>
<td>51.12 (11)</td>
<td>51.50 (17)$^c$</td>
</tr>
<tr>
<td>91</td>
<td>90.9056642</td>
<td>11.23 (11)</td>
<td>10.8</td>
<td>11.22 (5)</td>
<td>11.223 (71)$^c$</td>
</tr>
<tr>
<td>92</td>
<td>91.9065922</td>
<td>17.11 (17)</td>
<td>17.1</td>
<td>17.4 (4)</td>
<td>17.10 (10)$^c$</td>
</tr>
<tr>
<td>94</td>
<td>93.9063191</td>
<td>17.40 (17)</td>
<td>17.5</td>
<td>17.57 (4)</td>
<td>17.38 (10)$^c$</td>
</tr>
<tr>
<td>96</td>
<td>95.908272</td>
<td>2.80 (3)</td>
<td>2.9</td>
<td>2.79 (10)</td>
<td>2.799 (19)$^c$</td>
</tr>
</tbody>
</table>

Isotope ratio 90/92 91/92 94/96 99/99
|  90/92  | 3.008   | 3.023  | 2.938 | 3.011 |
|  91/92  | 0.566   | 0.532  | 0.645 | 0.566 |
|  94/96  | 1.017   | 1.023  | 1.010 | 1.016 |
|  99/99  | 0.144   | 0.170  | 0.160 | 0.164 |

Atomic weight 91.224 (8) 91.229 (6) 91.326 (5) 91.222 (4)

Error SD NS SD 2XSD

Annotation

## ISOTOPIC ABUNDANCES AND ATOMIC WEIGHTS OF THE ELEMENTS

### 40Zr Zirconium—continued

<table>
<thead>
<tr>
<th>Mass no.</th>
<th>Nuclidic mass</th>
<th>78SHI2</th>
<th>81MIN1</th>
<th>83NOM1</th>
<th>83ICA1</th>
</tr>
</thead>
<tbody>
<tr>
<td>90</td>
<td>69.9047080</td>
<td>51.449 (59)</td>
<td>51.444 ±0.085</td>
<td>51.452 (9) C</td>
<td>51.45 (2)</td>
</tr>
<tr>
<td>91</td>
<td>90.9066442</td>
<td>11.320 (15)</td>
<td>11.214 ±0.008</td>
<td>11.223 (12) C</td>
<td>11.22 (2)</td>
</tr>
<tr>
<td>92</td>
<td>91.9050392</td>
<td>17.189 (21)</td>
<td>17.151 ±0.008</td>
<td>17.146 (7) C</td>
<td>17.15 (1)</td>
</tr>
<tr>
<td>94</td>
<td>93.9063191</td>
<td>17.283 (21)</td>
<td>17.393 ±0.016</td>
<td>17.380 (12) C</td>
<td>17.38 (2)</td>
</tr>
<tr>
<td>96</td>
<td>95.906272</td>
<td>2.700 (4)</td>
<td>2.700 ±0.008</td>
<td>2.790 (5) C</td>
<td>2.900 (1)</td>
</tr>
</tbody>
</table>

**Isotope ratio 90/92**

<table>
<thead>
<tr>
<th>Mass no.</th>
<th>Isotope ratio</th>
<th>78SHI2</th>
<th>81MIN1</th>
<th>83NOM1</th>
<th>83ICA1</th>
</tr>
</thead>
<tbody>
<tr>
<td>90/92</td>
<td>2.993</td>
<td>3.000</td>
<td>3.0008 (12)</td>
<td>2.9965</td>
<td></td>
</tr>
<tr>
<td>91/92</td>
<td>0.659</td>
<td>0.654</td>
<td>0.6546 (7)</td>
<td>0.6564</td>
<td></td>
</tr>
<tr>
<td>94/92</td>
<td>1.005</td>
<td>1.014</td>
<td>1.0137 (12)</td>
<td>1.0093</td>
<td></td>
</tr>
<tr>
<td>96/92</td>
<td>0.161</td>
<td>0.163</td>
<td>0.1632 (8)</td>
<td>0.1619</td>
<td></td>
</tr>
</tbody>
</table>

**Atomic weight**

<table>
<thead>
<tr>
<th>Mass no.</th>
<th>78SHI2</th>
<th>81MIN1</th>
<th>83NOM1</th>
<th>83ICA1</th>
</tr>
</thead>
<tbody>
<tr>
<td>90</td>
<td>51.449 (59)</td>
<td>51.444 ±0.085</td>
<td>51.452 (9) C</td>
<td>51.45 (2)</td>
</tr>
<tr>
<td>91</td>
<td>11.320 (15)</td>
<td>11.214 ±0.008</td>
<td>11.223 (12) C</td>
<td>11.22 (2)</td>
</tr>
<tr>
<td>92</td>
<td>17.189 (21)</td>
<td>17.151 ±0.008</td>
<td>17.146 (7) C</td>
<td>17.15 (1)</td>
</tr>
<tr>
<td>94</td>
<td>17.283 (21)</td>
<td>17.393 ±0.016</td>
<td>17.380 (12) C</td>
<td>17.38 (2)</td>
</tr>
<tr>
<td>96</td>
<td>2.700 (4)</td>
<td>2.700 ±0.008</td>
<td>2.790 (5) C</td>
<td>2.900 (1)</td>
</tr>
</tbody>
</table>

**Error**

<table>
<thead>
<tr>
<th>Mass no.</th>
<th>78SHI2</th>
<th>81MIN1</th>
<th>83NOM1</th>
<th>83ICA1</th>
</tr>
</thead>
<tbody>
<tr>
<td>90</td>
<td>51.449 (59)</td>
<td>51.444 ±0.085</td>
<td>51.452 (9) C</td>
<td>51.45 (2)</td>
</tr>
<tr>
<td>91</td>
<td>11.320 (15)</td>
<td>11.214 ±0.008</td>
<td>11.223 (12) C</td>
<td>11.22 (2)</td>
</tr>
<tr>
<td>92</td>
<td>17.189 (21)</td>
<td>17.151 ±0.008</td>
<td>17.146 (7) C</td>
<td>17.15 (1)</td>
</tr>
<tr>
<td>94</td>
<td>17.283 (21)</td>
<td>17.393 ±0.016</td>
<td>17.380 (12) C</td>
<td>17.38 (2)</td>
</tr>
<tr>
<td>96</td>
<td>2.700 (4)</td>
<td>2.700 ±0.008</td>
<td>2.790 (5) C</td>
<td>2.900 (1)</td>
</tr>
</tbody>
</table>

**Annotation**

<table>
<thead>
<tr>
<th>Mass no.</th>
<th>78SHI2</th>
<th>81MIN1</th>
<th>83NOM1</th>
<th>83ICA1</th>
</tr>
</thead>
<tbody>
<tr>
<td>90</td>
<td>51.449 (59)</td>
<td>51.444 ±0.085</td>
<td>51.452 (9) C</td>
<td>51.45 (2)</td>
</tr>
<tr>
<td>91</td>
<td>11.320 (15)</td>
<td>11.214 ±0.008</td>
<td>11.223 (12) C</td>
<td>11.22 (2)</td>
</tr>
<tr>
<td>92</td>
<td>17.189 (21)</td>
<td>17.151 ±0.008</td>
<td>17.146 (7) C</td>
<td>17.15 (1)</td>
</tr>
<tr>
<td>94</td>
<td>17.283 (21)</td>
<td>17.393 ±0.016</td>
<td>17.380 (12) C</td>
<td>17.38 (2)</td>
</tr>
<tr>
<td>96</td>
<td>2.700 (4)</td>
<td>2.700 ±0.008</td>
<td>2.790 (5) C</td>
<td>2.900 (1)</td>
</tr>
</tbody>
</table>

---

### 41Nb Niobium

<table>
<thead>
<tr>
<th>Mass no.</th>
<th>56NH11</th>
<th>83ICA1</th>
</tr>
</thead>
<tbody>
<tr>
<td>93</td>
<td>92.9063780</td>
<td>100</td>
</tr>
</tbody>
</table>

**Isotope ratio**

<table>
<thead>
<tr>
<th>Mass no.</th>
<th>Isotope ratio</th>
<th>56NH11</th>
<th>83ICA1</th>
</tr>
</thead>
<tbody>
<tr>
<td>90/94</td>
<td>2.993</td>
<td>3.000</td>
<td>3.0008 (12)</td>
</tr>
<tr>
<td>91/94</td>
<td>0.659</td>
<td>0.654</td>
<td>0.6546 (7)</td>
</tr>
<tr>
<td>94/94</td>
<td>1.005</td>
<td>1.014</td>
<td>1.0137 (12)</td>
</tr>
<tr>
<td>96/94</td>
<td>0.161</td>
<td>0.163</td>
<td>0.1632 (8)</td>
</tr>
</tbody>
</table>

**Atomic weight**

<table>
<thead>
<tr>
<th>Mass no.</th>
<th>56NH11</th>
<th>83ICA1</th>
</tr>
</thead>
<tbody>
<tr>
<td>90</td>
<td>92.9063780</td>
<td>100</td>
</tr>
</tbody>
</table>

**Error**

<table>
<thead>
<tr>
<th>Mass no.</th>
<th>56NH11</th>
<th>83ICA1</th>
</tr>
</thead>
<tbody>
<tr>
<td>90</td>
<td>92.9063780</td>
<td>100</td>
</tr>
</tbody>
</table>

**Annotation**

---
### Element $^{42}$Mo Molybdenum

<table>
<thead>
<tr>
<th>Mass no.</th>
<th>Nuclidic mass</th>
<th>39MATI</th>
<th>40WALL</th>
<th>46WILL</th>
<th>46WILL</th>
</tr>
</thead>
<tbody>
<tr>
<td>92</td>
<td>91.905809</td>
<td>15.51</td>
<td>(14)</td>
<td>14.9</td>
<td>(2)</td>
</tr>
<tr>
<td>94</td>
<td>93.9050862</td>
<td>8.69</td>
<td>(12)</td>
<td>9.40</td>
<td>(9)</td>
</tr>
<tr>
<td>96</td>
<td>94.9058179</td>
<td>16.77</td>
<td>(17)</td>
<td>16.1</td>
<td>(7)</td>
</tr>
<tr>
<td>98</td>
<td>95.9046755</td>
<td>16.83</td>
<td>(12)</td>
<td>16.6</td>
<td>(2)</td>
</tr>
<tr>
<td>100</td>
<td>96.9060179</td>
<td>8.73</td>
<td>(12)</td>
<td>9.65</td>
<td>(10)</td>
</tr>
<tr>
<td>98</td>
<td>97.9054050</td>
<td>25.423</td>
<td>(82)</td>
<td>24.1</td>
<td>(2)</td>
</tr>
<tr>
<td>100</td>
<td>99.907473</td>
<td>8.54</td>
<td>(12)</td>
<td>9.25</td>
<td>(10)</td>
</tr>
<tr>
<td>Isotope ratio 92/96</td>
<td>0.922</td>
<td>0.898</td>
<td>0.957</td>
<td>0.959</td>
<td></td>
</tr>
<tr>
<td>94/96</td>
<td>0.516</td>
<td>0.566</td>
<td>0.550</td>
<td>0.543</td>
<td></td>
</tr>
<tr>
<td>96/96</td>
<td>0.567</td>
<td>0.370</td>
<td>0.953</td>
<td>0.950</td>
<td></td>
</tr>
<tr>
<td>98/96</td>
<td>0.510</td>
<td>0.581</td>
<td>0.573</td>
<td>0.574</td>
<td></td>
</tr>
<tr>
<td>100/96</td>
<td>1.011</td>
<td>1.462</td>
<td>1.433</td>
<td>1.446</td>
<td></td>
</tr>
<tr>
<td>Atomic weight</td>
<td>95.887 (8)</td>
<td>95.91 (1)</td>
<td>95.885 (9)</td>
<td>95.894 (9)</td>
<td></td>
</tr>
<tr>
<td>error</td>
<td>NS</td>
<td>P</td>
<td>P</td>
<td>P</td>
<td></td>
</tr>
</tbody>
</table>

### Annotation

<table>
<thead>
<tr>
<th>Mass no.</th>
<th>Nuclidic Mass</th>
<th>49HIBI</th>
<th>60UMUL</th>
<th>63MURI</th>
<th>64CROI</th>
<th>64METI</th>
</tr>
</thead>
<tbody>
<tr>
<td>92</td>
<td>91.906009</td>
<td>15.05</td>
<td>(1)</td>
<td>15.75</td>
<td>(20)</td>
<td>14.779</td>
</tr>
<tr>
<td>94</td>
<td>93.9050862</td>
<td>9.35</td>
<td>(1)</td>
<td>9.21</td>
<td>(9)</td>
<td>9.184</td>
</tr>
<tr>
<td>96</td>
<td>94.9058379</td>
<td>15.78</td>
<td>(4)</td>
<td>15.91</td>
<td>(7)</td>
<td>15.931</td>
</tr>
<tr>
<td>100</td>
<td>96.9060179</td>
<td>9.60</td>
<td>(1)</td>
<td>9.44</td>
<td>(2)</td>
<td>9.530</td>
</tr>
<tr>
<td>98</td>
<td>97.9054050</td>
<td>24.00</td>
<td>(3)</td>
<td>23.67</td>
<td>(6)</td>
<td>24.28</td>
</tr>
<tr>
<td>100</td>
<td>99.907473</td>
<td>9.68</td>
<td>(1)</td>
<td>9.56</td>
<td>(5)</td>
<td>9.597</td>
</tr>
<tr>
<td>Isotope ratio 92/96</td>
<td>0.909</td>
<td>0.961</td>
<td>0.985</td>
<td>0.982</td>
<td>0.987</td>
<td></td>
</tr>
<tr>
<td>94/96</td>
<td>0.565</td>
<td>0.562</td>
<td>0.550</td>
<td>0.545</td>
<td>0.553</td>
<td></td>
</tr>
<tr>
<td>96/96</td>
<td>0.567</td>
<td>0.571</td>
<td>0.567</td>
<td>0.572</td>
<td>0.573</td>
<td></td>
</tr>
<tr>
<td>100/96</td>
<td>0.585</td>
<td>0.584</td>
<td>0.575</td>
<td>0.576</td>
<td>0.573</td>
<td></td>
</tr>
<tr>
<td>Atomic weight</td>
<td>95.9116 (9)</td>
<td>95.883 (8)</td>
<td>95.936 (5)</td>
<td>95.943 (4)</td>
<td>95.931 (3)</td>
<td></td>
</tr>
<tr>
<td>error</td>
<td>NS</td>
<td>N</td>
<td>N</td>
<td>N</td>
<td>N</td>
<td></td>
</tr>
</tbody>
</table>

### Annotation
### ISOTOPIC ABUNDANCES AND ATOMIC WEIGHTS OF THE ELEMENTS

#### Element $^{42}_{42}$Mo Molybdenum—continued

<table>
<thead>
<tr>
<th>Mass no.</th>
<th>Nuclidian mass</th>
<th>72STE*</th>
<th>74MOO1</th>
<th>75TAM1</th>
<th>81MIN1</th>
<th>83ICA1</th>
</tr>
</thead>
<tbody>
<tr>
<td>92</td>
<td>91.906009</td>
<td>14.83</td>
<td>14.8362 (148)</td>
<td>14.827 (12)c</td>
<td>14.83 (3)c</td>
<td>14.84 (4)</td>
</tr>
<tr>
<td>94</td>
<td>93.905082</td>
<td>9.25</td>
<td>9.2466 (92)</td>
<td>9.239 (17)c</td>
<td>9.27 (5)c</td>
<td>9.25 (2)</td>
</tr>
<tr>
<td>95</td>
<td>94.9058379</td>
<td>15.92</td>
<td>15.9201 (159)</td>
<td>15.922 (22)c</td>
<td>15.90 (3)c</td>
<td>15.92 (4)</td>
</tr>
<tr>
<td>96</td>
<td>95.906075</td>
<td>16.07</td>
<td>16.0790 (167)</td>
<td>16.063 (22)c</td>
<td>16.07 (3)c</td>
<td>16.06 (4)</td>
</tr>
<tr>
<td>97</td>
<td>96.9060179</td>
<td>9.55</td>
<td>9.5551 (96)</td>
<td>9.557 (15)c</td>
<td>9.53 (2)c</td>
<td>9.55 (2)</td>
</tr>
<tr>
<td>100</td>
<td>99.907473</td>
<td>9.63</td>
<td>9.6335 (96)</td>
<td>9.629 (8)c</td>
<td>9.63 (2)c</td>
<td>9.63 (2)</td>
</tr>
<tr>
<td>Isotope ratio 92/96</td>
<td>0.890</td>
<td>0.8897</td>
<td>0.8888 (8)</td>
<td>0.8900 (18)</td>
<td>0.890</td>
<td></td>
</tr>
<tr>
<td>96/98</td>
<td>0.955</td>
<td>0.5553</td>
<td>0.5530 (10)</td>
<td>0.5561 (30)</td>
<td>0.555</td>
<td></td>
</tr>
<tr>
<td>95/96</td>
<td>0.956</td>
<td>0.9545</td>
<td>0.9544 (13)</td>
<td>0.9546 (24)</td>
<td>0.954</td>
<td></td>
</tr>
<tr>
<td>97/98</td>
<td>0.573</td>
<td>0.5730</td>
<td>0.5729 (9)</td>
<td>0.5740 (19)</td>
<td>0.573</td>
<td></td>
</tr>
<tr>
<td>99/96</td>
<td>1.448</td>
<td>1.4472</td>
<td>1.4472 (26)</td>
<td>1.4486 (44)</td>
<td>1.447</td>
<td></td>
</tr>
<tr>
<td>100/96</td>
<td>0.578</td>
<td>0.5775</td>
<td>0.5772 (5)</td>
<td>0.5779 (11)</td>
<td>0.577</td>
<td></td>
</tr>
<tr>
<td>Atomic weight</td>
<td>95.9319 (6)</td>
<td>95.9318 (9)</td>
<td>95.932 (1)</td>
<td>95.932 (2)</td>
<td>95.931 (2)</td>
<td></td>
</tr>
<tr>
<td>Error</td>
<td>2XSD</td>
<td>2XSD</td>
<td>SD</td>
<td>NS</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Annotation</td>
<td>3</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

#### Element $^{44}_{44}$Ru Ruthenium

<table>
<thead>
<tr>
<th>Mass no.</th>
<th>Nuclidian mass</th>
<th>44EWAl</th>
<th>53FR11</th>
<th>54BAL1</th>
<th>56WH11</th>
</tr>
</thead>
<tbody>
<tr>
<td>96</td>
<td>95.907596</td>
<td>5.68 (17)</td>
<td>5.50</td>
<td>5.47 (3)</td>
<td>5.57 (8)</td>
</tr>
<tr>
<td>98</td>
<td>98.9059371</td>
<td>12.81 (19)</td>
<td>12.70</td>
<td>12.77 (5)</td>
<td>12.7 (1)</td>
</tr>
<tr>
<td>100</td>
<td>100.905806</td>
<td>16.98 (25)</td>
<td>17.01</td>
<td>17.10 (6)</td>
<td>17.1 (1)</td>
</tr>
<tr>
<td>102</td>
<td>101.904375</td>
<td>31.34 (47)</td>
<td>31.52</td>
<td>31.70 (6)</td>
<td>31.6 (2)</td>
</tr>
<tr>
<td>104</td>
<td>103.905422</td>
<td>18.27 (27)</td>
<td>18.57</td>
<td>18.56 (5)</td>
<td>18.5 (1)</td>
</tr>
<tr>
<td>Isotope ratio 96/100</td>
<td>0.447</td>
<td>0.443</td>
<td>0.436</td>
<td>0.442</td>
<td></td>
</tr>
<tr>
<td>98/100</td>
<td>0.175</td>
<td>0.150</td>
<td>0.146</td>
<td>0.148</td>
<td></td>
</tr>
<tr>
<td>99/100</td>
<td>1.009</td>
<td>1.001</td>
<td>1.017</td>
<td>1.008</td>
<td></td>
</tr>
<tr>
<td>101/100</td>
<td>1.337</td>
<td>1.340</td>
<td>1.361</td>
<td>1.357</td>
<td></td>
</tr>
<tr>
<td>102/100</td>
<td>2.468</td>
<td>2.484</td>
<td>2.524</td>
<td>2.508</td>
<td></td>
</tr>
<tr>
<td>104/100</td>
<td>1.439</td>
<td>1.471</td>
<td>1.478</td>
<td>1.468</td>
<td></td>
</tr>
<tr>
<td>Atomic weight</td>
<td>101.03 (1)</td>
<td>101.0672 (7)</td>
<td>101.069 (3)</td>
<td>101.062 (5)</td>
<td></td>
</tr>
<tr>
<td>Error</td>
<td>P</td>
<td>NS</td>
<td>NS</td>
<td>NS</td>
<td></td>
</tr>
<tr>
<td>Annotation</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
### Element $^{44}_{\text{Ru}}$ Ruthenium -- continued

<table>
<thead>
<tr>
<th>Mass no.</th>
<th>Nuclidic mass</th>
<th>70TAK1</th>
<th>76GEV1</th>
<th>83ICA1</th>
</tr>
</thead>
<tbody>
<tr>
<td>96</td>
<td>95.907596</td>
<td>5.52</td>
<td>5.52 (1)</td>
<td>5.52 (5)</td>
</tr>
<tr>
<td>98</td>
<td>97.905287</td>
<td>1.87</td>
<td>1.86 (1)</td>
<td>1.88 (5)</td>
</tr>
<tr>
<td>99</td>
<td>98.9059371</td>
<td>12.67</td>
<td>12.74 (2)</td>
<td>12.7 (1)</td>
</tr>
<tr>
<td>100</td>
<td>99.9042175</td>
<td>12.60</td>
<td>12.60 (2)</td>
<td>12.6 (1)</td>
</tr>
<tr>
<td>101</td>
<td>100.9055808</td>
<td>17.09</td>
<td>17.05 (1)</td>
<td>17.0 (1)</td>
</tr>
<tr>
<td>102</td>
<td>101.9043475</td>
<td>31.55</td>
<td>31.57 (3)</td>
<td>31.5 (2)</td>
</tr>
<tr>
<td>104</td>
<td>103.905422</td>
<td>18.71</td>
<td>18.66 (3)</td>
<td>18.7 (2)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Isotope ratio</th>
<th>96/100</th>
<th>98/100</th>
<th>99/100</th>
<th>101/100</th>
<th>102/100</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>0.439</td>
<td>0.439</td>
<td>0.438</td>
<td>1.006</td>
<td>1.356</td>
</tr>
<tr>
<td></td>
<td>0.148</td>
<td>0.148</td>
<td>0.148</td>
<td>1.011</td>
<td>1.353</td>
</tr>
<tr>
<td></td>
<td>1.006</td>
<td>1.006</td>
<td>1.006</td>
<td>1.006</td>
<td>1.006</td>
</tr>
<tr>
<td>Atomic weight</td>
<td>101.0805 (7)</td>
<td>101.068 (1)</td>
<td>101.070 (7)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Error

Annotation B

### Element $^{45}_{\text{Rh}}$ Rhodium

<table>
<thead>
<tr>
<th>Mass no.</th>
<th>Nuclidic mass</th>
<th>63LEI1</th>
<th>83ICA1</th>
</tr>
</thead>
<tbody>
<tr>
<td>103</td>
<td>102.905503</td>
<td>100</td>
<td>100</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Isotope ratio</th>
<th>103/103</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1.000</td>
</tr>
</tbody>
</table>

| Atomic weight | 102.90550 (2) | 102.90550 (2) |

Error

Annotation
### ISOTOPIC ABUNDANCES AND ATOMIC WEIGHTS OF THE ELEMENTS

#### Element 46\(^\text{Pd}\) Palladium

<table>
<thead>
<tr>
<th>Mass no.</th>
<th>Nuclidic mass</th>
<th>53SITI</th>
<th>78KEL1</th>
<th>78SHI1</th>
<th>81MERI</th>
<th>83ICA1</th>
</tr>
</thead>
<tbody>
<tr>
<td>107</td>
<td>106.904026</td>
<td>10.97</td>
<td>11.089 (2)(^C)</td>
<td>11.14 (5)</td>
<td>11.261 (8)(^C)</td>
<td>11.14 (8)</td>
</tr>
<tr>
<td>108</td>
<td>106.905169</td>
<td>11.81</td>
<td>11.759 (2)(^C)</td>
<td>11.72 (6)</td>
<td>11.515 (8)(^C)</td>
<td>11.72 (9)</td>
</tr>
</tbody>
</table>

Isotope ratio 102/104:
- 0.0875
- 2.0264
- 2.4913
- 2.4348
- 1.0766

Atomic weight:
- 106.4307 (7)
- 106.4198 (1)
- 106.415 (3)
- 106.3987 (5)
- 106.415 (4)

Error:
- NS
- 2XSE
- 2XSD
- 2XSE

Annotation:
- C, B

### Element 47\(^\text{Ag}\) Silver

<table>
<thead>
<tr>
<th>Mass no.</th>
<th>Nuclidic mass</th>
<th>48PAU1</th>
<th>48WHI1</th>
<th>57HES1</th>
<th>57HES1</th>
</tr>
</thead>
<tbody>
<tr>
<td>107</td>
<td>106.905095</td>
<td>51.92 (14)(^C)</td>
<td>51.35 (7)</td>
<td>51.99 (46)(^C)</td>
<td>51.90 (35)(^C)</td>
</tr>
<tr>
<td>109</td>
<td>108.904754</td>
<td>48.08 (14)(^C)</td>
<td>48.66 (7)</td>
<td>48.01 (46)(^C)</td>
<td>48.10 (35)(^C)</td>
</tr>
</tbody>
</table>

Isotope ratio 107/109:
- 1.006 (6)
- 1.055

Atomic weight:
- 107.867 (3)
- 107.878 (1)
- 107.865 (9)
- 107.867 (7)

Error:
- 3XSD
- SE
- SE
- SE

Annotation

---

<table>
<thead>
<tr>
<th>Mass no.</th>
<th>Nuclidic mass</th>
<th>60MUR1</th>
<th>60SH11</th>
<th>62CRO1</th>
<th>62MUR1</th>
</tr>
</thead>
<tbody>
<tr>
<td>107</td>
<td>106.905095</td>
<td>51.737 (46)(^C)</td>
<td>51.818 (30)(^C)</td>
<td>51.77 (10)(^C)</td>
<td>51.597 (46)(^C)</td>
</tr>
<tr>
<td>109</td>
<td>106.904754</td>
<td>48.263 (46)(^C)</td>
<td>48.182 (30)(^C)</td>
<td>48.23 (10)(^C)</td>
<td>48.403 (46)(^C)</td>
</tr>
<tr>
<td>Isotope ratio 107/109</td>
<td>1.072 (2)</td>
<td>1.075647 (130)</td>
<td>1.0733 (43)</td>
<td>1.066 (2)</td>
<td></td>
</tr>
<tr>
<td>Atomic weight</td>
<td>$^{107,109}\text{Ag}$ (9)</td>
<td>107.8686 (6)</td>
<td>107.870 (2)</td>
<td>107.8730 (9)</td>
<td></td>
</tr>
<tr>
<td>Error</td>
<td>P</td>
<td>3XSD</td>
<td>3XSD</td>
<td>SD</td>
<td></td>
</tr>
<tr>
<td>Annotation</td>
<td>c</td>
<td>c</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Mass no.</th>
<th>Nuclidic mass</th>
<th>62MUR1</th>
<th>62SH11</th>
<th>62CRO1</th>
<th>63MUR1</th>
</tr>
</thead>
<tbody>
<tr>
<td>107</td>
<td>106.905095</td>
<td>51.503 (49)(^C)</td>
<td>51.527 (49)(^C)</td>
<td>51.830 (26)(^C)</td>
<td>52.07 (2)</td>
</tr>
<tr>
<td>109</td>
<td>108.904754</td>
<td>48.496 (44)(^C)</td>
<td>48.477 (40)(^C)</td>
<td>48.170 (26)(^C)</td>
<td>47.93 (2)</td>
</tr>
<tr>
<td>Isotope ratio 107/109</td>
<td>1.062 (2)</td>
<td>1.063 (2)</td>
<td>1.07597 (135)</td>
<td>1.0864</td>
<td></td>
</tr>
<tr>
<td>Atomic weight</td>
<td>107.87 (1)</td>
<td>107.874 (1)</td>
<td>107.8683 (5)</td>
<td>107.8635 (4)</td>
<td></td>
</tr>
<tr>
<td>Error</td>
<td>SD</td>
<td>SD</td>
<td>3XSD</td>
<td>NS</td>
<td></td>
</tr>
<tr>
<td>Annotation</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Mass no.</th>
<th>Nuclidic mass</th>
<th>82POW1</th>
<th>83CHE1</th>
<th>83ICA1</th>
</tr>
</thead>
<tbody>
<tr>
<td>107</td>
<td>106.905095</td>
<td>51.839170 (5057)</td>
<td>51.948 (9)(^C)</td>
<td>51.839 (5)</td>
</tr>
<tr>
<td>109</td>
<td>108.904754</td>
<td>48.160830 (5057)</td>
<td>48.052 (9)(^C)</td>
<td>48.161 (5)</td>
</tr>
<tr>
<td>Isotope ratio 107/109</td>
<td>1.07638 (135)</td>
<td>1.0811 (17)</td>
<td>1.07637</td>
<td></td>
</tr>
<tr>
<td>Atomic weight</td>
<td>107.8681 (1)</td>
<td>107.8660 (2)</td>
<td>107.8682 (1)</td>
<td></td>
</tr>
<tr>
<td>Error</td>
<td>3XSD</td>
<td>2XSD</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Annotation</td>
<td>c, B</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
### ISOTOPIC ABUNDANCES AND ATOMIC WEIGHTS OF THE ELEMENTS

**Element 48Cd Cadmium**

<table>
<thead>
<tr>
<th>Mass no.</th>
<th>Nuclidic mass</th>
<th>48EWALL</th>
<th>48LEE1</th>
<th>48WI11</th>
<th>49WI12</th>
</tr>
</thead>
<tbody>
<tr>
<td>106</td>
<td>106.906461</td>
<td>1.2</td>
<td>1.27(2)</td>
<td>1.26(2)</td>
<td>1.26(2)</td>
</tr>
<tr>
<td>108</td>
<td>107.904186</td>
<td>0.7</td>
<td>0.56(2)</td>
<td>0.57(2)</td>
<td>0.59(2)</td>
</tr>
<tr>
<td>110</td>
<td>109.903097</td>
<td>12.8</td>
<td>12.8(4)</td>
<td>12.7(4)</td>
<td>12.8(4)</td>
</tr>
<tr>
<td>111</td>
<td>110.904182</td>
<td>13.0</td>
<td>12.7(4)</td>
<td>12.8(4)</td>
<td>12.7(4)</td>
</tr>
<tr>
<td>112</td>
<td>111.9027614</td>
<td>24.0</td>
<td>23.7(9)</td>
<td>23.7(9)</td>
<td>23.7(9)</td>
</tr>
<tr>
<td>113</td>
<td>112.9044013</td>
<td>12.2</td>
<td>12.5(4)</td>
<td>12.5(4)</td>
<td>12.5(4)</td>
</tr>
<tr>
<td>114</td>
<td>113.903607</td>
<td>28.9</td>
<td>28.6(4)</td>
<td>28.6(4)</td>
<td>28.6(4)</td>
</tr>
<tr>
<td>116</td>
<td>115.904758</td>
<td>7.0</td>
<td>7.5(3)</td>
<td>7.5(3)</td>
<td>7.5(3)</td>
</tr>
</tbody>
</table>

**Isotope ratio 106/112**

<table>
<thead>
<tr>
<th>Mass no.</th>
<th>Nuclidic mass</th>
<th>SOTA1</th>
<th>SOTRO1</th>
<th>SOTWI1</th>
<th>SOTWI1</th>
</tr>
</thead>
<tbody>
<tr>
<td>106</td>
<td>105.906461</td>
<td>1.24(15)</td>
<td>1.25(1)</td>
<td>1.27(2)</td>
<td>1.25(2)</td>
</tr>
<tr>
<td>108</td>
<td>107.904186</td>
<td>0.87(1)</td>
<td>0.88(6)</td>
<td>0.90(2)</td>
<td>0.89(1)</td>
</tr>
<tr>
<td>110</td>
<td>109.903097</td>
<td>12.3(2)</td>
<td>12.5(5)</td>
<td>12.4(5)</td>
<td>12.4(6)</td>
</tr>
<tr>
<td>111</td>
<td>110.904182</td>
<td>12.6(7)</td>
<td>12.8(4)</td>
<td>12.8(5)</td>
<td>12.8(6)</td>
</tr>
<tr>
<td>112</td>
<td>111.9027614</td>
<td>24.1(12)</td>
<td>24.1(7)</td>
<td>24.1(7)</td>
<td>24.1(7)</td>
</tr>
<tr>
<td>113</td>
<td>112.9044013</td>
<td>12.2(3)</td>
<td>12.2(4)</td>
<td>12.2(4)</td>
<td>12.2(4)</td>
</tr>
<tr>
<td>114</td>
<td>113.903607</td>
<td>28.9(20)</td>
<td>28.7(10)</td>
<td>28.7(8)</td>
<td>28.7(21)</td>
</tr>
<tr>
<td>116</td>
<td>115.904758</td>
<td>7.6(8)</td>
<td>7.4(5)</td>
<td>7.4(5)</td>
<td>7.4(5)</td>
</tr>
</tbody>
</table>

**Isotope ratio 106/112**

<table>
<thead>
<tr>
<th>Mass no.</th>
<th>Nuclidic mass</th>
<th>SOTA1</th>
<th>SOTRO1</th>
<th>SOTWI1</th>
<th>SOTWI1</th>
</tr>
</thead>
<tbody>
<tr>
<td>106</td>
<td>105.906461</td>
<td>0.0510</td>
<td>0.0510</td>
<td>0.0510</td>
<td>0.0510</td>
</tr>
<tr>
<td>108</td>
<td>107.904186</td>
<td>0.0361</td>
<td>0.0370</td>
<td>0.0370</td>
<td>0.0369</td>
</tr>
<tr>
<td>110</td>
<td>109.903097</td>
<td>0.5101</td>
<td>0.5104</td>
<td>0.5104</td>
<td>0.5104</td>
</tr>
<tr>
<td>111</td>
<td>110.904182</td>
<td>0.5246</td>
<td>0.5209</td>
<td>0.5209</td>
<td>0.5209</td>
</tr>
<tr>
<td>112</td>
<td>111.9027614</td>
<td>0.5064</td>
<td>0.5093</td>
<td>0.5093</td>
<td>0.5093</td>
</tr>
<tr>
<td>113</td>
<td>112.9044013</td>
<td>1.1979</td>
<td>1.1898</td>
<td>1.1898</td>
<td>1.1898</td>
</tr>
<tr>
<td>114</td>
<td>113.903607</td>
<td>0.3151</td>
<td>0.3096</td>
<td>0.3096</td>
<td>0.3096</td>
</tr>
</tbody>
</table>

**Atomic Weight**

<table>
<thead>
<tr>
<th>Error</th>
</tr>
</thead>
<tbody>
<tr>
<td>NS</td>
</tr>
<tr>
<td>P</td>
</tr>
<tr>
<td>P</td>
</tr>
<tr>
<td>SD</td>
</tr>
</tbody>
</table>

**Annotation**

C

### Element $^{115}$In Indium

<table>
<thead>
<tr>
<th>Mass no.</th>
<th>Nuclidic mass</th>
<th>48HIN1</th>
<th>49HIB2</th>
<th>56HIN1</th>
<th>83ICA1</th>
</tr>
</thead>
<tbody>
<tr>
<td>112</td>
<td>112.904056</td>
<td>4.23 (2)</td>
<td>4.14 (1)</td>
<td>4.33 (4)</td>
<td>4.3 (2)</td>
</tr>
<tr>
<td>115</td>
<td>114.903875</td>
<td>95.77 (3)</td>
<td>95.84 (1)</td>
<td>95.67 (4)</td>
<td>95.7 (2)</td>
</tr>
<tr>
<td>Isotope ratio 113/115</td>
<td>0.04417</td>
<td>0.04341</td>
<td>0.04526</td>
<td>0.04493</td>
<td></td>
</tr>
<tr>
<td>Atomic weight</td>
<td>114.8193 (6)</td>
<td>114.8207 (2)</td>
<td>114.8173 (8)</td>
<td>114.818 (4)</td>
<td></td>
</tr>
<tr>
<td>Error</td>
<td>SE</td>
<td>SD</td>
<td>NS</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Annotation</td>
<td>B</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### Element $^{119}$Sn Tin

<table>
<thead>
<tr>
<th>Mass no.</th>
<th>Nuclidic mass</th>
<th>48HIN1</th>
<th>49HIB2</th>
<th>49HIB2X</th>
</tr>
</thead>
<tbody>
<tr>
<td>112</td>
<td>111.904823</td>
<td>0.94 (2)</td>
<td>0.900 (3)</td>
<td>1.01 (3)</td>
</tr>
<tr>
<td>114</td>
<td>113.902781</td>
<td>0.65 (3)</td>
<td>0.61 (1)</td>
<td>0.68 (1)</td>
</tr>
<tr>
<td>115</td>
<td>114.9033441</td>
<td>0.33 (2)</td>
<td>0.350 (6)</td>
<td>0.35 (3)</td>
</tr>
<tr>
<td>116</td>
<td>116.9017438</td>
<td>14.74 (4)</td>
<td>14.77 (4)</td>
<td>14.79 (1)</td>
</tr>
<tr>
<td>117</td>
<td>116.9029536</td>
<td>7.51 (4)</td>
<td>7.54 (3)</td>
<td>7.67 (5)</td>
</tr>
<tr>
<td>118</td>
<td>117.9016066</td>
<td>24.21 (7)</td>
<td>23.98 (3)</td>
<td>23.84 (8)</td>
</tr>
<tr>
<td>119</td>
<td>118.903102</td>
<td>8.45 (4)</td>
<td>8.620 (3)</td>
<td>8.68 (1)</td>
</tr>
<tr>
<td>120</td>
<td>119.902190</td>
<td>33.11 (10)</td>
<td>33.03 (12)</td>
<td>32.75 (3)</td>
</tr>
<tr>
<td>122</td>
<td>121.903440</td>
<td>4.61 (5)</td>
<td>4.78 (1)</td>
<td>4.74 (4)</td>
</tr>
<tr>
<td>124</td>
<td>123.905271</td>
<td>5.83 (5)</td>
<td>6.110 (6)</td>
<td>6.01 (9)</td>
</tr>
<tr>
<td>Isotope ratio 112/120</td>
<td>0.0281</td>
<td>0.0272</td>
<td>0.0308</td>
<td></td>
</tr>
<tr>
<td>114/120</td>
<td>0.0196</td>
<td>0.0185</td>
<td>0.0208</td>
<td></td>
</tr>
<tr>
<td>115/120</td>
<td>0.0100</td>
<td>0.0106</td>
<td>0.0107</td>
<td></td>
</tr>
<tr>
<td>116/120</td>
<td>0.4337</td>
<td>0.4260</td>
<td>0.4360</td>
<td></td>
</tr>
<tr>
<td>117/120</td>
<td>0.2283</td>
<td>0.2283</td>
<td>0.2342</td>
<td></td>
</tr>
<tr>
<td>118/120</td>
<td>0.1711</td>
<td>0.1711</td>
<td>0.1728</td>
<td></td>
</tr>
<tr>
<td>119/120</td>
<td>0.2552</td>
<td>0.2610</td>
<td>0.2650</td>
<td></td>
</tr>
<tr>
<td>122/120</td>
<td>0.1392</td>
<td>0.1447</td>
<td>0.1447</td>
<td></td>
</tr>
<tr>
<td>124/120</td>
<td>0.1761</td>
<td>0.1850</td>
<td>0.1835</td>
<td></td>
</tr>
<tr>
<td>Atomic weight</td>
<td>118.729 (4)</td>
<td>118.762 (3)</td>
<td>118.746 (6)</td>
<td></td>
</tr>
<tr>
<td>Error</td>
<td>P</td>
<td>SE</td>
<td>SD</td>
<td></td>
</tr>
<tr>
<td>Annotation</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### ISOTOPIC ABUNDANCES AND ATOMIC WEIGHS OF THE ELEMENTS

#### Element 50\textsuperscript{Sn} Tin--continued

<table>
<thead>
<tr>
<th>Mass no.</th>
<th>Nuclidic Mass</th>
<th>520DB1</th>
<th>65LAE1</th>
<th>83DEVI</th>
<th>83ICA1</th>
</tr>
</thead>
<tbody>
<tr>
<td>112</td>
<td>111.904823</td>
<td>0.99 (5)</td>
<td>1.01 (3)</td>
<td>0.973 (3)</td>
<td>0.97 (1)</td>
</tr>
<tr>
<td>114</td>
<td>113.902781</td>
<td>0.68 (3)</td>
<td>0.67 (3)</td>
<td>0.652 (3)</td>
<td>0.65 (1)</td>
</tr>
<tr>
<td>115</td>
<td>114.9033441</td>
<td>0.36 (3)</td>
<td>0.38 (3)</td>
<td>0.359 (3)</td>
<td>0.36 (1)</td>
</tr>
<tr>
<td>117</td>
<td>116.9029536</td>
<td>7.71 (8)</td>
<td>7.75 (3)</td>
<td>7.675 (23)</td>
<td>7.68 (7)</td>
</tr>
<tr>
<td>118</td>
<td>117.9016066</td>
<td>24.00 (20)</td>
<td>24.30 (9)</td>
<td>24.219 (26)</td>
<td>24.22 (11)</td>
</tr>
<tr>
<td>119</td>
<td>118.9033102</td>
<td>8.59 (8)</td>
<td>8.55 (3)</td>
<td>8.583 (13)</td>
<td>8.58 (4)</td>
</tr>
<tr>
<td>120</td>
<td>119.9021990</td>
<td>32.52 (30)</td>
<td>32.38 (8)</td>
<td>32.590 (33)</td>
<td>32.59 (10)</td>
</tr>
<tr>
<td>122</td>
<td>121.903440</td>
<td>4.77 (5)</td>
<td>4.56 (3)</td>
<td>4.629 (9)</td>
<td>4.63 (3)</td>
</tr>
<tr>
<td>124</td>
<td>123.905271</td>
<td>5.81 (6)</td>
<td>5.64 (3)</td>
<td>5.789 (18)</td>
<td>5.79 (5)</td>
</tr>
</tbody>
</table>

#### Isotope ratio 112/120

<table>
<thead>
<tr>
<th>Mass no.</th>
<th>Isotope ratio 112/120</th>
</tr>
</thead>
<tbody>
<tr>
<td>114</td>
<td>0.0209 (0)</td>
</tr>
<tr>
<td>115</td>
<td>0.0111 (0)</td>
</tr>
<tr>
<td>116</td>
<td>0.4456 (0)</td>
</tr>
<tr>
<td>117</td>
<td>0.4371 (0)</td>
</tr>
<tr>
<td>118</td>
<td>0.7408 (0)</td>
</tr>
<tr>
<td>119</td>
<td>0.2641 (0)</td>
</tr>
<tr>
<td>122</td>
<td>0.1467 (0)</td>
</tr>
<tr>
<td>124</td>
<td>0.1787 (0)</td>
</tr>
</tbody>
</table>

#### Atomic weight

| 118.726 (7) | 118.685 (4) | 118.710 (7) | 118.710 (5) |

#### Error

| p | 5D | 3XSD |

#### Annotation

B

### Element 51\textsuperscript{Sb} Antimony

<table>
<thead>
<tr>
<th>Mass no.</th>
<th>Nuclidic mass</th>
<th>4BH1</th>
<th>83ICA1</th>
</tr>
</thead>
<tbody>
<tr>
<td>121</td>
<td>120.9038237</td>
<td>57.25 (57)</td>
<td>57.3 (9)</td>
</tr>
<tr>
<td>123</td>
<td>122.904222</td>
<td>42.75 (57)</td>
<td>42.7 (9)</td>
</tr>
</tbody>
</table>

#### Isotope ratio 121/123

| 1.339 (1) |

#### Atomic weight

| 131.76 (1) | 131.76 (2) |

#### Error

| p |

#### Annotation

B
### Element $^{52}$Te Tellurium

<table>
<thead>
<tr>
<th>Mass no.</th>
<th>Nuclidic mass</th>
<th>46WI1</th>
<th>48WH1</th>
<th>48WH2</th>
<th>49HIB2</th>
</tr>
</thead>
<tbody>
<tr>
<td>120</td>
<td>119.904021</td>
<td>0.090 (6)$^C$</td>
<td>0.091 (1)</td>
<td>0.092</td>
<td>0.090 (10)</td>
</tr>
<tr>
<td>122</td>
<td>121.903055</td>
<td>2.43 (6)$^C$</td>
<td>2.49 (2)</td>
<td>2.32</td>
<td>2.47 (1)</td>
</tr>
<tr>
<td>123</td>
<td>122.904278</td>
<td>0.85 (2)$^C$</td>
<td>0.89 (2)</td>
<td>0.88</td>
<td>0.89 (1)</td>
</tr>
<tr>
<td>124</td>
<td>123.902825</td>
<td>4.59 (13)$^C$</td>
<td>4.63 (5)</td>
<td>4.51</td>
<td>4.74 (2)</td>
</tr>
<tr>
<td>125</td>
<td>124.904435</td>
<td>6.96 (7)$^C$</td>
<td>7.01 (1)</td>
<td>6.99</td>
<td>7.03 (3)</td>
</tr>
<tr>
<td>126</td>
<td>125.903310</td>
<td>18.70 (7)$^C$</td>
<td>18.72 (4)</td>
<td>18.53</td>
<td>18.72 (5)</td>
</tr>
<tr>
<td>128</td>
<td>127.904464</td>
<td>31.85 (9)$^C$</td>
<td>31.72 (1)</td>
<td>32.57</td>
<td>31.75 (6)</td>
</tr>
<tr>
<td>130</td>
<td>129.906229</td>
<td>34.51 (7)$^C$</td>
<td>34.46 (9)</td>
<td>34.11</td>
<td>34.27 (5)</td>
</tr>
</tbody>
</table>

**Isotope ratio**

<table>
<thead>
<tr>
<th>Mass no.</th>
<th>Nuclidic mass</th>
<th>JSM1</th>
<th>JICA1</th>
</tr>
</thead>
<tbody>
<tr>
<td>120</td>
<td>119.904021</td>
<td>0.0960 (7)$^C$</td>
<td>0.096 (2)</td>
</tr>
<tr>
<td>122</td>
<td>121.903066</td>
<td>2.602 (2)$^C$</td>
<td>2.60 (1)</td>
</tr>
<tr>
<td>123</td>
<td>122.904278</td>
<td>0.908 (1)$^C$</td>
<td>0.908 (3)</td>
</tr>
<tr>
<td>124</td>
<td>123.902825</td>
<td>4.816 (3)$^C$</td>
<td>4.816 (8)</td>
</tr>
<tr>
<td>125</td>
<td>124.904435</td>
<td>7.139 (3)$^C$</td>
<td>7.14 (1)</td>
</tr>
<tr>
<td>126</td>
<td>125.903310</td>
<td>18.952 (5)$^C$</td>
<td>18.95 (1)</td>
</tr>
<tr>
<td>128</td>
<td>127.904464</td>
<td>31.667 (7)$^C$</td>
<td>31.69 (2)</td>
</tr>
<tr>
<td>130</td>
<td>129.906229</td>
<td>33.799 (7)$^C$</td>
<td>33.80 (2)</td>
</tr>
</tbody>
</table>

**Error**

<table>
<thead>
<tr>
<th>Mass no.</th>
<th>Nuclidic mass</th>
<th>JSM1</th>
<th>JICA1</th>
</tr>
</thead>
</table>

**Isotope ratio**

<table>
<thead>
<tr>
<th>Mass no.</th>
<th>Nuclidic mass</th>
<th>JSM1</th>
<th>JICA1</th>
</tr>
</thead>
</table>

**Atomic weight**

<table>
<thead>
<tr>
<th>Mass no.</th>
<th>Nuclidic mass</th>
<th>JSM1</th>
<th>JICA1</th>
</tr>
</thead>
</table>

**Error**

<table>
<thead>
<tr>
<th>Mass no.</th>
<th>Nuclidic mass</th>
<th>JSM1</th>
<th>JICA1</th>
</tr>
</thead>
</table>

**Annotation**

- NS
- SE
- SD

---

### ISOTOPIC ABUNDANCES AND ATOMIC WEIGHTS OF THE ELEMENTS

#### Element 53 Iodine

<table>
<thead>
<tr>
<th>Mass no.</th>
<th>1961 126.9044</th>
<th>1969 126.9045</th>
</tr>
</thead>
<tbody>
<tr>
<td>127</td>
<td>126.904477</td>
<td>100</td>
</tr>
</tbody>
</table>

**Isotope ratio**

**Atomic weight**

<table>
<thead>
<tr>
<th>Isotope</th>
<th>126.90448 (3)</th>
<th>126.90448 (3)</th>
</tr>
</thead>
</table>

**Error**

| NS |

**Annotation**

---

#### Element 54 Xenon

<table>
<thead>
<tr>
<th>Mass no.</th>
<th>1961 131.30</th>
<th>1979 131.29 (3)</th>
</tr>
</thead>
<tbody>
<tr>
<td>124</td>
<td>129.90012</td>
<td>0.102 (9)</td>
</tr>
<tr>
<td>126</td>
<td>125.904281</td>
<td>0.098 (3)</td>
</tr>
<tr>
<td>128</td>
<td>127.9035308</td>
<td>1.93 (1)</td>
</tr>
<tr>
<td>129</td>
<td>128.9047801</td>
<td>26.51 (2)</td>
</tr>
<tr>
<td>130</td>
<td>129.9050095</td>
<td>3.68 (4)</td>
</tr>
<tr>
<td>131</td>
<td>130.905076</td>
<td>21.04 (9)</td>
</tr>
<tr>
<td>132</td>
<td>131.904148</td>
<td>27.12 (7)</td>
</tr>
<tr>
<td>134</td>
<td>133.905395</td>
<td>10.54 (5)</td>
</tr>
<tr>
<td>136</td>
<td>135.907219</td>
<td>8.98 (3)</td>
</tr>
</tbody>
</table>

**Isotope ratio**

<table>
<thead>
<tr>
<th>Isotope</th>
<th>126/130</th>
<th>128/130</th>
<th>129/130</th>
<th>131/130</th>
<th>132/130</th>
<th>134/130</th>
<th>136/130</th>
</tr>
</thead>
<tbody>
<tr>
<td>126/130</td>
<td>0.0977</td>
<td>0.0266</td>
<td>0.5245</td>
<td>7.204</td>
<td>5.717</td>
<td>7.070</td>
<td>2.440</td>
</tr>
<tr>
<td>128/130</td>
<td>0.0994</td>
<td>0.0217</td>
<td>0.4730</td>
<td>6.474</td>
<td>5.241</td>
<td>0.644</td>
<td>2.203</td>
</tr>
<tr>
<td>129/130</td>
<td>0.0944</td>
<td>0.0220</td>
<td>0.4709</td>
<td>6.488</td>
<td>5.196</td>
<td>0.699</td>
<td>2.176</td>
</tr>
<tr>
<td>131/130</td>
<td>0.0226</td>
<td>0.0220</td>
<td>0.4709</td>
<td>6.505</td>
<td>5.224</td>
<td>0.614</td>
<td>2.182</td>
</tr>
<tr>
<td>132/130</td>
<td>0.0220</td>
<td>0.0220</td>
<td>0.4709</td>
<td>6.505</td>
<td>5.224</td>
<td>0.614</td>
<td>2.182</td>
</tr>
<tr>
<td>134/130</td>
<td>0.0226</td>
<td>0.0220</td>
<td>0.4709</td>
<td>6.505</td>
<td>5.224</td>
<td>0.614</td>
<td>2.182</td>
</tr>
<tr>
<td>136/130</td>
<td>0.0220</td>
<td>0.0220</td>
<td>0.4709</td>
<td>6.505</td>
<td>5.224</td>
<td>0.614</td>
<td>2.182</td>
</tr>
</tbody>
</table>

**Atomic weight**

<table>
<thead>
<tr>
<th>Isotope</th>
<th>131.304 (2)</th>
<th>131.302 (2)</th>
<th>131.292 (2)</th>
<th>131.293 (1)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Error</td>
<td>SD</td>
<td>SE</td>
<td>P</td>
<td>2XSD</td>
</tr>
</tbody>
</table>

**Annotation**

*B*
### Element 54Xe Xenon—continued

<table>
<thead>
<tr>
<th>Mass no.</th>
<th>Nuclidic mass</th>
<th>S3ICA1</th>
</tr>
</thead>
<tbody>
<tr>
<td>124</td>
<td>123.90612</td>
<td>0.10 (1)</td>
</tr>
<tr>
<td>126</td>
<td>125.904281</td>
<td>0.09 (1)</td>
</tr>
<tr>
<td>128</td>
<td>127.9035308</td>
<td>1.91 (3)</td>
</tr>
<tr>
<td>129</td>
<td>128.90308/41</td>
<td>0.9 (6)</td>
</tr>
<tr>
<td>130</td>
<td>129.9035095</td>
<td>4.1 (1)</td>
</tr>
<tr>
<td>134</td>
<td>133.905395</td>
<td>10.4 (2)</td>
</tr>
<tr>
<td>136</td>
<td>135.907219</td>
<td>8.9 (1)</td>
</tr>
</tbody>
</table>

Isotope ratio:
- 124/130: 0.0244
- 126/130: 0.0220
- 128/130: 0.4659
- 129/130: 6.439
- 130/130: 5.171
- 131/130: 6.561
- 132/130: 0.237
- 136/130: 2.171

Atomic weight: 131.29 (2)

Error

Annotation

### Element 55Cs Coesium

<table>
<thead>
<tr>
<th>Mass no.</th>
<th>Nuclidic mass</th>
<th>S6WHI</th>
<th>S3ICA1</th>
</tr>
</thead>
<tbody>
<tr>
<td>133</td>
<td>133.905450</td>
<td>100</td>
<td>100</td>
</tr>
</tbody>
</table>

Isotope ratio

Atomic weight: 132.90543 (5) 132.90543 (5)

Error: NS

Annotation
# ISOTOPIC ABUNDANCES AND ATOMIC WEIGHTS OF THE ELEMENTS

## Element $^{56}$Ba Barium

<table>
<thead>
<tr>
<th>Mass no.</th>
<th>Nuclidic mass</th>
<th>38NEIE</th>
<th>49HERI</th>
<th>56AK11</th>
<th>60GU11</th>
<th>62RID1</th>
</tr>
</thead>
<tbody>
<tr>
<td>130</td>
<td>129.906277</td>
<td>0.1010 (43)$^\text{c}$</td>
<td>0.103 (4)</td>
<td>0.13 (2)</td>
<td>0.109 (50)</td>
<td>0.098 (2)</td>
</tr>
<tr>
<td>132</td>
<td>131.905042</td>
<td>0.0975 (43)$^\text{c}$</td>
<td>0.096 (4)</td>
<td>0.19 (2)</td>
<td>0.103 (50)</td>
<td>0.091 (3)</td>
</tr>
<tr>
<td>134</td>
<td>133.904490</td>
<td>2.415 (49)$^\text{c}$</td>
<td>2.39 (5)</td>
<td>2.60 (5)</td>
<td>2.45 (5)</td>
<td>2.33 (2)</td>
</tr>
<tr>
<td>135</td>
<td>134.905668</td>
<td>6.59 (13)$^\text{d}$</td>
<td>5.56 (12)</td>
<td>6.73 (12)</td>
<td>6.72 (19)</td>
<td>6.42 (3)</td>
</tr>
<tr>
<td>136</td>
<td>135.905556</td>
<td>7.81 (13)$^\text{c}$</td>
<td>7.79 (10)</td>
<td>8.07 (10)</td>
<td>8.06 (13)</td>
<td>7.77 (2)</td>
</tr>
<tr>
<td>137</td>
<td>136.906010</td>
<td>11.32 (19)$^\text{c}$</td>
<td>11.25 (10)</td>
<td>11.07 (20)</td>
<td>11.41 (10)</td>
<td>11.10 (5)</td>
</tr>
<tr>
<td>138</td>
<td>137.905236</td>
<td>71.66 (21)$^\text{c}$</td>
<td>71.83 (29)</td>
<td>70.41 (35)</td>
<td>71.12 (13)</td>
<td>72.11 (6)</td>
</tr>
</tbody>
</table>

### Isotope ratio

<table>
<thead>
<tr>
<th>130/138</th>
<th>0.00141 (6)</th>
<th>0.001434</th>
<th>0.00185</th>
<th>0.00153</th>
<th>0.00159</th>
</tr>
</thead>
<tbody>
<tr>
<td>132/138</td>
<td>0.00136 (6)</td>
<td>0.001336</td>
<td>0.00270</td>
<td>0.00145</td>
<td>0.001262</td>
</tr>
<tr>
<td>134/138</td>
<td>0.0337 (6)</td>
<td>0.03327</td>
<td>0.03593</td>
<td>0.03445</td>
<td>0.03231</td>
</tr>
<tr>
<td>135/138</td>
<td>0.092 (2)</td>
<td>0.0913</td>
<td>0.0956</td>
<td>0.09449</td>
<td>0.09803</td>
</tr>
<tr>
<td>136/138</td>
<td>0.109 (2)</td>
<td>0.1085</td>
<td>0.1146</td>
<td>0.11333</td>
<td>0.10775</td>
</tr>
<tr>
<td>137/138</td>
<td>0.156 (3)</td>
<td>0.1566</td>
<td>0.160e</td>
<td>0.160e</td>
<td>0.160e</td>
</tr>
</tbody>
</table>

### Atomic weight

| 137.328 (4) | 137.317 (4) | 137.297 (5) | 137.315 (7) | 137.341 (1) |

### Error

| 2XSD | P | NS | SD |

## Annotation

<table>
<thead>
<tr>
<th>Mass no.</th>
<th>Nuclidic mass</th>
<th>62UNE1</th>
<th>69EUG1</th>
<th>73LAE1</th>
<th>76CHO1</th>
</tr>
</thead>
<tbody>
<tr>
<td>130</td>
<td>129.906277</td>
<td>0.1022 (1)$^\text{c}$</td>
<td>0.1058 (2)</td>
<td>0.1054 (4)$^\text{c}$</td>
<td>0.10</td>
</tr>
<tr>
<td>132</td>
<td>131.905042</td>
<td>0.0986 (1)$^\text{c}$</td>
<td>0.1012 (2)</td>
<td>0.1013 (4)$^\text{c}$</td>
<td>0.10</td>
</tr>
<tr>
<td>134</td>
<td>133.904490</td>
<td>2.388 (2)$^\text{c}$</td>
<td>2.417 (3)</td>
<td>2.411 (2)$^\text{c}$</td>
<td>2.42</td>
</tr>
<tr>
<td>135</td>
<td>134.905668</td>
<td>6.531 (6)$^\text{d}$</td>
<td>6.592 (2)</td>
<td>6.593 (6)$^\text{d}$</td>
<td>6.59</td>
</tr>
<tr>
<td>136</td>
<td>135.905556</td>
<td>7.817 (6)$^\text{c}$</td>
<td>7.853 (4)</td>
<td>7.863 (6)$^\text{c}$</td>
<td>7.81</td>
</tr>
<tr>
<td>137</td>
<td>136.906010</td>
<td>11.174 (7)$^\text{c}$</td>
<td>11.229 (4)</td>
<td>11.246 (4)$^\text{c}$</td>
<td>11.22</td>
</tr>
<tr>
<td>138</td>
<td>137.905236</td>
<td>71.929 (23)$^\text{c}$</td>
<td>71.699 (7)</td>
<td>71.678 (23)$^\text{c}$</td>
<td>71.66</td>
</tr>
</tbody>
</table>

### Isotope ratio

<table>
<thead>
<tr>
<th>130/138</th>
<th>0.0014215 (20)</th>
<th>0.001473</th>
<th>0.001471 (6)</th>
<th>0.00140</th>
</tr>
</thead>
<tbody>
<tr>
<td>132/138</td>
<td>0.0013712 (17)</td>
<td>0.001412</td>
<td>0.001413 (6)</td>
<td>0.00140</td>
</tr>
<tr>
<td>134/138</td>
<td>0.033197 (34)</td>
<td>0.03371</td>
<td>0.03363 (3)</td>
<td>0.0338</td>
</tr>
<tr>
<td>135/138</td>
<td>0.09080 (8)</td>
<td>0.09194</td>
<td>0.09198 (9)</td>
<td>0.0920</td>
</tr>
<tr>
<td>136/138</td>
<td>0.10868 (9)</td>
<td>0.10952</td>
<td>0.10970 (9)</td>
<td>0.1090</td>
</tr>
<tr>
<td>137/138</td>
<td>0.15479 (10)</td>
<td>0.15665</td>
<td>0.15613 (10)</td>
<td>0.1580</td>
</tr>
</tbody>
</table>

### Atomic weight

| 137.327 (2) | 137.3269 (1) | 137.3268 (2) | 137.327 (1) |

### Error

| 2XSD | SE | 3XSD | NS |

## Annotation

C, B
### Mass no. 83ICAL

<table>
<thead>
<tr>
<th>Mass no.</th>
<th>Nuclidic mass</th>
<th>83ICAL</th>
</tr>
</thead>
<tbody>
<tr>
<td>130</td>
<td>129.906277</td>
<td>0.106  (2)</td>
</tr>
<tr>
<td>132</td>
<td>131.905042</td>
<td>0.101  (2)</td>
</tr>
<tr>
<td>134</td>
<td>133.904490</td>
<td>2.417  (27)</td>
</tr>
<tr>
<td>135</td>
<td>134.905668</td>
<td>6.592  (18)</td>
</tr>
<tr>
<td>136</td>
<td>135.904556</td>
<td>7.854  (39)</td>
</tr>
<tr>
<td>137</td>
<td>136.905016</td>
<td>11.25  (1)</td>
</tr>
<tr>
<td>138</td>
<td>137.906236</td>
<td>71.70  (7)</td>
</tr>
</tbody>
</table>

### Isotope ratio 130/138

<table>
<thead>
<tr>
<th>Isotope ratio</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>130/138</td>
<td>0.001478</td>
</tr>
<tr>
<td>132/138</td>
<td>0.001409</td>
</tr>
<tr>
<td>134/138</td>
<td>0.03371</td>
</tr>
<tr>
<td>135/138</td>
<td>0.09194</td>
</tr>
<tr>
<td>136/138</td>
<td>0.10954</td>
</tr>
<tr>
<td>137/138</td>
<td>0.15649</td>
</tr>
</tbody>
</table>

### Atomic weight 137.327 (1)

### Error

### Annotation

---

### Element 57La Lanthanum

#### 1961 138.91 1969 138.9055 (3)

<table>
<thead>
<tr>
<th>Mass no.</th>
<th>Nuclidic mass</th>
<th>GEING2</th>
<th>56WHIL</th>
<th>72MAG1</th>
<th>75YANT</th>
<th>83ICAL</th>
</tr>
</thead>
<tbody>
<tr>
<td>138</td>
<td>137.907114</td>
<td>0.089  (2)</td>
<td>0.0885 (16)</td>
<td>0.089  (2)^C</td>
<td>0.089  (2)^C</td>
<td>0.09  (2)</td>
</tr>
<tr>
<td>139</td>
<td>138.906385</td>
<td>99.911  (2)</td>
<td>99.9115 (16)</td>
<td>99.911  (2)^C</td>
<td>99.911  (2)^C</td>
<td>99.91  (2)</td>
</tr>
</tbody>
</table>

### Isotope ratio 138/139

<table>
<thead>
<tr>
<th>Isotope ratio</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>138/139</td>
<td>0.000891</td>
</tr>
<tr>
<td></td>
<td>0.000893 (16)</td>
</tr>
<tr>
<td></td>
<td>.0008873 (24)</td>
</tr>
<tr>
<td></td>
<td>.000890 (7)</td>
</tr>
<tr>
<td></td>
<td>.000891</td>
</tr>
</tbody>
</table>

### Atomic weight 138.907114 (2) 138.906385 (2) 138.9055 (2)

### Error

<table>
<thead>
<tr>
<th>Error</th>
</tr>
</thead>
<tbody>
<tr>
<td>SE</td>
</tr>
<tr>
<td>NS</td>
</tr>
<tr>
<td>2XSD</td>
</tr>
<tr>
<td>2XSD</td>
</tr>
</tbody>
</table>

### Annotation

B
### ISOTOPIC ABUNDANCES AND ATOMIC WEIGHS OF THE ELEMENTS

#### Element 58\text{Ce} Cerium

<table>
<thead>
<tr>
<th>Mass no.</th>
<th>Nuclidic mass</th>
<th>47ING2</th>
<th>49HIB2</th>
<th>62UME1</th>
<th>83ICA1</th>
</tr>
</thead>
<tbody>
<tr>
<td>196</td>
<td>196.00714</td>
<td>0.197 (5)</td>
<td>0.195 (5)</td>
<td>0.19744 (3)</td>
<td>0.19 (1)</td>
</tr>
<tr>
<td>138</td>
<td>137.905996</td>
<td>0.250 (5)</td>
<td>0.265 (5)</td>
<td>0.2536 (4)</td>
<td>0.25 (1)</td>
</tr>
<tr>
<td>140</td>
<td>139.905442</td>
<td>88.48 (10)</td>
<td>88.449 (20)</td>
<td>88.475 (8)</td>
<td>88.48 (10)</td>
</tr>
<tr>
<td>142</td>
<td>141.909249</td>
<td>11.07 (10)</td>
<td>11.098 (33)</td>
<td>11.081 (7)</td>
<td>11.08 (10)</td>
</tr>
</tbody>
</table>

Isotope ratio

| 136/140  | 0.002181     | 0.002205    | 0.0021526 (29) | 0.002147 |
| 138/140  | 0.002025     | 0.002996    | 0.0028663 (41) | 0.002825 |
| 142/140  | 0.1251       | 0.12547     | 0.12523 (6)    | 0.1252   |

Atomic weight | 140.115 (2) | 140.1147 (6) | 140.1148 (1) | 140.115 (2) |

Error

<table>
<thead>
<tr>
<th>SE</th>
<th>SD</th>
<th>2XSD</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Annotation | B |

#### Element 59\text{Pr} Praseodymium

<table>
<thead>
<tr>
<th>Mass no.</th>
<th>Nuclidic mass</th>
<th>57COL1</th>
<th>83ICA1</th>
</tr>
</thead>
<tbody>
<tr>
<td>141</td>
<td>140.907657</td>
<td>100</td>
<td>100</td>
</tr>
</tbody>
</table>

Isotope ratio

| Atomic weight | 140.90766 (3) | 140.90766 (3) |

Error | NS |

Annotation | |

---

### Element $^{60}$Nd Neodymium

<table>
<thead>
<tr>
<th>Mass no.</th>
<th>Nuclidic mass</th>
<th>47ING3</th>
<th>48ING2</th>
<th>48MAT1</th>
<th>53WAL1</th>
</tr>
</thead>
<tbody>
<tr>
<td>142</td>
<td>141.007731</td>
<td>27.26</td>
<td>27.13 (20)</td>
<td>26.00 (16)</td>
<td>27.00 (3)</td>
</tr>
<tr>
<td>143</td>
<td>142.909823</td>
<td>12.26</td>
<td>12.20 (10)</td>
<td>12.12 (8)</td>
<td>12.14 (2)</td>
</tr>
<tr>
<td>144</td>
<td>143.910096</td>
<td>23.97</td>
<td>23.87 (20)</td>
<td>23.91 (12)</td>
<td>23.83 (3)</td>
</tr>
<tr>
<td>145</td>
<td>144.912582</td>
<td>8.23</td>
<td>8.30 (5)</td>
<td>8.35 (8)</td>
<td>8.29 (1)</td>
</tr>
<tr>
<td>146</td>
<td>145.913126</td>
<td>17.06</td>
<td>17.18 (20)</td>
<td>17.35 (9)</td>
<td>17.26 (2)</td>
</tr>
<tr>
<td>148</td>
<td>147.916901</td>
<td>5.65</td>
<td>5.72 (6)</td>
<td>5.76 (8)</td>
<td>5.74 (2)</td>
</tr>
<tr>
<td>150</td>
<td>149.920900</td>
<td>5.53</td>
<td>5.50 (6)</td>
<td>5.69 (8)</td>
<td>5.63 (2)</td>
</tr>
</tbody>
</table>

Isootope ratio 143/142
- 0.4499
- 0.8797
- 0.3020
- 0.6261
- 0.2077
- 0.2030

Isotope ratio 145/142
- 0.4497
- 0.8798
- 0.3060
- 0.6333
- 0.2108
- 0.2064

Isotope ratio 146/142
- 0.4522
- 0.8921
- 0.3116
- 0.6474
- 0.2157
- 0.2123

Isotope ratio 148/142
- 0.4513
- 0.8859
- 0.3129
- 0.6457
- 0.2234
- 0.2145

Isotope ratio 150/142
- 0.4404
- 0.8762
- 0.3054
- 0.6329
- 0.2113
- 0.2075

Isotope ratio 144/142
- 0.4405
- 0.8774
- 0.3056
- 0.6322
- 0.2113
- 0.2069

Isotope ratio 146/142
- 0.4400
- 0.8773
- 0.3059
- 0.6336
- 0.2123
- 0.2078

Isotope ratio 148/142
- 0.4400
- 0.8773
- 0.3059
- 0.6336
- 0.2123
- 0.2078

Isotope ratio 150/142
- 0.4400
- 0.8773
- 0.3059
- 0.6336
- 0.2123
- 0.2078

Atomic weight
- 144.2254 (8)
- 144.238 (7)
- 144.257 (7)
- 144.244 (2)

### Annotation

<table>
<thead>
<tr>
<th>Mass no.</th>
<th>Nuclidic mass</th>
<th>56WHI1</th>
<th>64KOMI</th>
<th>76NAKI</th>
<th>81HOLI</th>
<th>83ICA1</th>
</tr>
</thead>
<tbody>
<tr>
<td>142</td>
<td>141.007731</td>
<td>27.3 (2)</td>
<td>26.81 (60)</td>
<td>27.157</td>
<td>27.16 (4)</td>
<td>27.13 (10)</td>
</tr>
<tr>
<td>143</td>
<td>142.909823</td>
<td>12.32 (9)</td>
<td>12.07 (45)</td>
<td>12.177</td>
<td>12.18 (2)</td>
<td>12.18 (5)</td>
</tr>
<tr>
<td>144</td>
<td>143.910096</td>
<td>23.8 (2)</td>
<td>23.75 (60)</td>
<td>23.795</td>
<td>23.83 (4)</td>
<td>23.80 (10)</td>
</tr>
<tr>
<td>145</td>
<td>144.912582</td>
<td>8.29 (6)</td>
<td>8.39 (23)</td>
<td>8.293</td>
<td>8.30 (2)</td>
<td>8.30 (5)</td>
</tr>
<tr>
<td>146</td>
<td>145.913126</td>
<td>17.10 (14)</td>
<td>17.31 (53)</td>
<td>17.188</td>
<td>17.17 (3)</td>
<td>17.19 (8)</td>
</tr>
<tr>
<td>148</td>
<td>147.916901</td>
<td>5.67 (5)</td>
<td>5.99 (28)</td>
<td>5.755</td>
<td>5.74 (1)</td>
<td>5.76 (3)</td>
</tr>
<tr>
<td>150</td>
<td>149.920900</td>
<td>5.56 (5)</td>
<td>5.75 (35)</td>
<td>5.635</td>
<td>5.62 (1)</td>
<td>5.64 (3)</td>
</tr>
</tbody>
</table>

Isootope ratio 143/142
- 0.4513
- 0.8797
- 0.3037
- 0.6260
- 0.2077
- 0.2037

Isootope ratio 144/142
- 0.4502
- 0.8859
- 0.3129
- 0.6457
- 0.2234
- 0.2145

Isootope ratio 145/142
- 0.4404
- 0.8762
- 0.3054
- 0.6329
- 0.2113
- 0.2075

Isootope ratio 146/142
- 0.4405
- 0.8774
- 0.3056
- 0.6322
- 0.2113
- 0.2069

Isootope ratio 148/142
- 0.4400
- 0.8773
- 0.3059
- 0.6336
- 0.2123
- 0.2078

Isootope ratio 150/142
- 0.4400
- 0.8773
- 0.3059
- 0.6336
- 0.2123
- 0.2078

Atomic weight
- 144.227 (6)
- 144.227 (3)
- 144.24123 (8)
- 144.239 (11)
- 144.242 (3)

Error

<table>
<thead>
<tr>
<th>Error</th>
<th>NS</th>
<th>NS</th>
<th>NS</th>
<th>2x10</th>
</tr>
</thead>
</table>

Annotation

B
### ISOTOPIC ABUNDANCES AND ATOMIC WEIGHS OF THE ELEMENTS

<table>
<thead>
<tr>
<th>Element</th>
<th>63Sm</th>
<th>Samarium</th>
</tr>
</thead>
<tbody>
<tr>
<td>1961</td>
<td>150.35</td>
<td>1969</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Mass no.</th>
<th>Nuclidic mass</th>
<th>48ING1</th>
<th>48MAT1</th>
<th>50HIB1</th>
<th>57AIT1</th>
</tr>
</thead>
<tbody>
<tr>
<td>144</td>
<td>143.912009</td>
<td>3.16 (10)</td>
<td>2.95 (7)</td>
<td>2.87 (15)</td>
<td>3.02 (2)</td>
</tr>
<tr>
<td>147</td>
<td>146.914907</td>
<td>15.07 (15)</td>
<td>14.62 (12)</td>
<td>14.94 (6)</td>
<td>14.87 (4)</td>
</tr>
<tr>
<td>148</td>
<td>147.914832</td>
<td>11.27 (11)</td>
<td>10.97 (11)</td>
<td>11.24 (5)</td>
<td>11.22 (3)</td>
</tr>
<tr>
<td>149</td>
<td>146.917193</td>
<td>13.84 (14)</td>
<td>13.56 (12)</td>
<td>13.86 (6)</td>
<td>13.82 (4)</td>
</tr>
<tr>
<td>150</td>
<td>149.917285</td>
<td>7.47 (7)</td>
<td>7.27 (10)</td>
<td>7.36 (7)</td>
<td>7.40 (2)</td>
</tr>
<tr>
<td>154</td>
<td>153.922218</td>
<td>22.53 (22)</td>
<td>23.29 (19)</td>
<td>22.84 (13)</td>
<td>22.88 (6)</td>
</tr>
</tbody>
</table>

**Isotope ratio** 144/147:
- 144/147 = 0.1187
- 146/152 = 0.5659
- 148/152 = 0.4232
- 150/152 = 0.2005
- 154/152 = 0.0400

**Atomic weight**
- 150.34 (1) 150.43 (1) 150.39 (1) 150.37 (3)

**Error**
- 3XSE NS 2XSD NS

**Annotation**
### Element $^{63}$Eu Europium

<table>
<thead>
<tr>
<th>Mass no.</th>
<th>Nuclidic mass</th>
<th>47ING3</th>
<th>48HESI</th>
<th>57COL1</th>
<th>64KOMI</th>
<th>72LOVI</th>
</tr>
</thead>
<tbody>
<tr>
<td>151</td>
<td>150.919060</td>
<td>47.75</td>
<td>47.77 (25)</td>
<td>47.86 (8)</td>
<td>47.86 (28)</td>
<td>47.794 (25)</td>
</tr>
<tr>
<td>153</td>
<td>152.921243</td>
<td>52.25</td>
<td>52.23 (25)</td>
<td>52.14 (8)</td>
<td>52.14 (28)</td>
<td>52.206 (25)</td>
</tr>
</tbody>
</table>

Isotope ratio 151/153: 0.9139, 0.9146 (91), 0.9179, 0.9179, 0.9155 (9)

Atomic weight: 151.9666 (2), 151.966 (5), 151.963 (2), 151.963 (6), 151.9647 (5)

Error: NS, P, SD, NS, 2xSD

### Element $^{64}$Gd Gadolinium

<table>
<thead>
<tr>
<th>Mass no.</th>
<th>Nuclidic mass</th>
<th>72LOVI</th>
<th>81HOL1</th>
<th>83IGAI</th>
</tr>
</thead>
<tbody>
<tr>
<td>151</td>
<td>150.919060</td>
<td>47.808 (50)</td>
<td>47.81 (3)</td>
<td>47.8 (5)</td>
</tr>
<tr>
<td>153</td>
<td>152.921242</td>
<td>62.102 (50)</td>
<td>62.10 (3)</td>
<td>62.2 (5)</td>
</tr>
</tbody>
</table>

Isotope ratio 151/153: 0.9160 (18), 0.9160, 0.9157

Atomic weight: 151.964 (1), 151.9644 (6), 151.96 (1)

Error: 2xSD, 2xSD

### Element $^{67}$Gd Gadolinium

<table>
<thead>
<tr>
<th>Mass no.</th>
<th>Nuclidic mass</th>
<th>47ING3</th>
<th>48HESI</th>
<th>50EL1</th>
<th>57COL1</th>
</tr>
</thead>
<tbody>
<tr>
<td>152</td>
<td>151.919803</td>
<td>0.20</td>
<td>0.200 (2)</td>
<td>0.200 (5)</td>
<td>0.205 (10)</td>
</tr>
<tr>
<td>154</td>
<td>153.920876</td>
<td>2.1</td>
<td>2.15 (2)</td>
<td>2.16 (2)</td>
<td>2.23 (3)</td>
</tr>
<tr>
<td>155</td>
<td>154.922629</td>
<td>14.90</td>
<td>14.78 (15)</td>
<td>14.68 (15)</td>
<td>15.1U (15)</td>
</tr>
<tr>
<td>156</td>
<td>155.922130</td>
<td>20.67</td>
<td>20.59 (21)</td>
<td>20.36 (20)</td>
<td>20.6 (2)</td>
</tr>
<tr>
<td>157</td>
<td>156.923967</td>
<td>15.73</td>
<td>15.71 (16)</td>
<td>15.64 (16)</td>
<td>15.70 (16)</td>
</tr>
<tr>
<td>159</td>
<td>159.927061</td>
<td>21.77</td>
<td>21.79 (22)</td>
<td>22.01 (22)</td>
<td>21.6 (2)</td>
</tr>
</tbody>
</table>

Isotope ratio 152/158: 0.00806, 0.00807, 0.0080, 0.00837

154/158: 0.0846, 0.0868, 0.0865, 0.0816

155/158: 0.6003, 0.5964, 0.5881, 0.5156

156/158: 0.6009, 0.5975, 0.5817, 0.6409

157/158: 0.6338, 0.6340, 0.6266, 0.6409

160/158: 0.8771, 0.8793, 0.8818, 0.8817


Error: NS, P, P, SD

### Annotation

---

ISOTOPIC ABUNDANCES AND ATOMIC WEIGHTS OF THE ELEMENTS

Element 64\textsuperscript{Gd} Gadolinium—continued

<table>
<thead>
<tr>
<th>Mass no.</th>
<th>Nuclidic mass</th>
<th>66KOMI</th>
<th>70EUGI</th>
<th>81HOLI</th>
<th>83ICA1</th>
</tr>
</thead>
<tbody>
<tr>
<td>152</td>
<td>151.919603</td>
<td>0.19 (1)</td>
<td>0.2029 (5)</td>
<td>0.200 (5)</td>
<td>0.20 (1)</td>
</tr>
<tr>
<td>154</td>
<td>153.920876</td>
<td>2.14 (1)</td>
<td>2.1809 (6)</td>
<td>2.18 (3)</td>
<td>2.18 (3)</td>
</tr>
<tr>
<td>155</td>
<td>154.922629</td>
<td>14.66 (28)</td>
<td>14.800 (3)</td>
<td>14.80 (6)</td>
<td>14.60 (5)</td>
</tr>
<tr>
<td>156</td>
<td>155.922130</td>
<td>20.57 (48)</td>
<td>20.466 (2)</td>
<td>20.47 (8)</td>
<td>20.47 (4)</td>
</tr>
<tr>
<td>157</td>
<td>156.923967</td>
<td>15.71 (20)</td>
<td>15.652 (2)</td>
<td>15.65 (6)</td>
<td>15.65 (3)</td>
</tr>
<tr>
<td>158</td>
<td>157.924111</td>
<td>25.09 (47)</td>
<td>24.835 (4)</td>
<td>24.84 (9)</td>
<td>24.84 (12)</td>
</tr>
<tr>
<td>160</td>
<td>159.927061</td>
<td>21.67 (42)</td>
<td>21.863 (2)</td>
<td>21.86 (8)</td>
<td>21.86 (4)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Isotope ratio 152/158</th>
<th>0.0075</th>
<th>0.008170</th>
<th>0.00805</th>
<th>0.00805</th>
</tr>
</thead>
<tbody>
<tr>
<td>154/158</td>
<td>0.0853</td>
<td>0.08782</td>
<td>0.0878</td>
<td>0.0878</td>
</tr>
<tr>
<td>155/158</td>
<td>0.5943</td>
<td>0.59593</td>
<td>0.5958</td>
<td>0.5958</td>
</tr>
<tr>
<td>156/158</td>
<td>0.8196</td>
<td>0.82406</td>
<td>0.8241</td>
<td>0.8241</td>
</tr>
<tr>
<td>157/158</td>
<td>0.6261</td>
<td>0.63074</td>
<td>0.6300</td>
<td>0.6300</td>
</tr>
<tr>
<td>160/158</td>
<td>0.8637</td>
<td>0.86033</td>
<td>0.8800</td>
<td>0.8800</td>
</tr>
</tbody>
</table>

Atomic weight 157.25 (1) 157.2520 (1) 157.252 (3) 157.252 (2)

Error

Annotation B

Element 65\textsuperscript{Tb} Terbium

<table>
<thead>
<tr>
<th>Mass no.</th>
<th>Nuclidic mass</th>
<th>67COL1</th>
<th>83ICA1</th>
</tr>
</thead>
<tbody>
<tr>
<td>159</td>
<td>158.925350</td>
<td>100</td>
<td>100</td>
</tr>
</tbody>
</table>

Isotope ratio

<table>
<thead>
<tr>
<th>Atomic weight</th>
<th>158.92535 (3)</th>
<th>158.92535 (4)</th>
</tr>
</thead>
</table>

Error NS

Annotation

### Dysprosium

<table>
<thead>
<tr>
<th>Mass no.</th>
<th>Nuclidic mass</th>
<th>49INGI</th>
<th>50LELI</th>
<th>57COLI</th>
<th>66XOMI</th>
</tr>
</thead>
<tbody>
<tr>
<td>156</td>
<td>155.924287</td>
<td>0.0524 (9)</td>
<td>0.064 0.001 +0.064</td>
<td>0.057 (1)</td>
<td>0.058 (9)</td>
</tr>
<tr>
<td>158</td>
<td>157.924412</td>
<td>0.0902 (9)</td>
<td>0.105 0.001 +0.105</td>
<td>0.100 (1)</td>
<td>0.092 (4)</td>
</tr>
<tr>
<td>160</td>
<td>159.925203</td>
<td>2.294 (11)</td>
<td>2.36 (10)</td>
<td>2.35 (2)</td>
<td>2.53 (8)</td>
</tr>
<tr>
<td>161</td>
<td>160.926939</td>
<td>18.88 (9)</td>
<td>18.73 (19)</td>
<td>19.0 (1)</td>
<td>19.04 (25)</td>
</tr>
<tr>
<td>162</td>
<td>161.926605</td>
<td>26.52 (12)</td>
<td>26.26 (26)</td>
<td>26.2 (2)</td>
<td>26.52 (16)</td>
</tr>
<tr>
<td>163</td>
<td>162.928737</td>
<td>24.97 (12)</td>
<td>24.91 (25)</td>
<td>24.9 (2)</td>
<td>24.87 (30)</td>
</tr>
<tr>
<td>164</td>
<td>163.929183</td>
<td>29.19 (14)</td>
<td>28.47 +0.25 -0.30</td>
<td>28.1 (2)</td>
<td>28.18 (10)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Isotope ratio 156/164</th>
<th>0.00186</th>
<th>0.00225</th>
<th>0.00203</th>
<th>0.0021</th>
</tr>
</thead>
<tbody>
<tr>
<td>158/164</td>
<td>0.00320</td>
<td>0.00357</td>
<td>0.00356</td>
<td>0.0033</td>
</tr>
<tr>
<td>160/164</td>
<td>0.00347</td>
<td>0.00329</td>
<td>0.00336</td>
<td>0.0036</td>
</tr>
<tr>
<td>161/164</td>
<td>0.0701</td>
<td>0.0579</td>
<td>0.0762</td>
<td>0.0757</td>
</tr>
<tr>
<td>162/164</td>
<td>0.9056</td>
<td>0.8908</td>
<td>0.9075</td>
<td>0.9056</td>
</tr>
<tr>
<td>163/164</td>
<td>0.8861</td>
<td>0.8750</td>
<td>0.8861</td>
<td>0.8825</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Atomic weight 162.499 (3)</th>
<th>162.50 (1)</th>
<th>162.495 (4)</th>
<th>162.492 (7)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Error P</td>
<td>P</td>
<td>SD</td>
<td>NS</td>
</tr>
</tbody>
</table>

### Annotation

<table>
<thead>
<tr>
<th>Mass no.</th>
<th>Nuclidic mass</th>
<th>81HOLI</th>
<th>83ICAI</th>
</tr>
</thead>
<tbody>
<tr>
<td>156</td>
<td>155.924287</td>
<td>0.056 (1)</td>
<td>0.06 (1)</td>
</tr>
<tr>
<td>158</td>
<td>157.924412</td>
<td>0.096 (2)</td>
<td>0.10 (1)</td>
</tr>
<tr>
<td>160</td>
<td>159.925203</td>
<td>2.34 (2)</td>
<td>2.34 (5)</td>
</tr>
<tr>
<td>161</td>
<td>160.926939</td>
<td>18.91 (5)</td>
<td>18.9 (1)</td>
</tr>
<tr>
<td>162</td>
<td>161.926605</td>
<td>25.51 (7)</td>
<td>25.5 (2)</td>
</tr>
<tr>
<td>163</td>
<td>162.928737</td>
<td>24.90 (7)</td>
<td>24.9 (2)</td>
</tr>
<tr>
<td>164</td>
<td>163.929183</td>
<td>28.19 (8)</td>
<td>28.2 (2)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Isotope ratio 156/164</th>
<th>0.00199</th>
<th>0.00213</th>
</tr>
</thead>
<tbody>
<tr>
<td>158/164</td>
<td>0.00341</td>
<td>0.00355</td>
</tr>
<tr>
<td>160/164</td>
<td>0.00330</td>
<td>0.00330</td>
</tr>
<tr>
<td>161/164</td>
<td>0.6708</td>
<td>0.6702</td>
</tr>
<tr>
<td>162/164</td>
<td>0.9043</td>
<td>0.9043</td>
</tr>
<tr>
<td>163/164</td>
<td>0.8833</td>
<td>0.8830</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Atomic weight 162.498 (2)</th>
<th>162.498 (4)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Error 2XSD</td>
<td></td>
</tr>
</tbody>
</table>

### Annotation

B
### ISOTOPIC ABUNDANCES AND ATOMIC WEIGHTS OF THE ELEMENTS

#### holmium (67Ho)

<table>
<thead>
<tr>
<th>Mass no.</th>
<th>1961 164.930</th>
<th>1969 164.9303</th>
<th>1971 164.9304</th>
</tr>
</thead>
<tbody>
<tr>
<td>165</td>
<td>164.930332</td>
<td>100</td>
<td>100</td>
</tr>
</tbody>
</table>

**Isotope ratio**

**Atomic weight**

<table>
<thead>
<tr>
<th>Mass no.</th>
<th>1961 164.93033</th>
<th>1969 164.93033 (4)</th>
<th>1971 164.93033 (4)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Error</td>
<td>NS</td>
<td>NS</td>
<td>NS</td>
</tr>
</tbody>
</table>

**Annotation**

---

#### erbium (68Er)

<table>
<thead>
<tr>
<th>Mass no.</th>
<th>1961 167.26</th>
<th>1969 167.26 (3)</th>
</tr>
</thead>
<tbody>
<tr>
<td>162</td>
<td>161.928787</td>
<td>0.1</td>
</tr>
<tr>
<td>164</td>
<td>163.929211</td>
<td>1.5</td>
</tr>
<tr>
<td>166</td>
<td>166.932061</td>
<td>24.4</td>
</tr>
<tr>
<td>168</td>
<td>167.932383</td>
<td>26.9</td>
</tr>
<tr>
<td>170</td>
<td>169.935476</td>
<td>14.2</td>
</tr>
</tbody>
</table>

**Isotope ratio 162/166**

<table>
<thead>
<tr>
<th>Mass no.</th>
<th>162/166</th>
</tr>
</thead>
<tbody>
<tr>
<td>164/166</td>
<td>0.00304</td>
</tr>
<tr>
<td>167/166</td>
<td>0.7416</td>
</tr>
<tr>
<td>168/166</td>
<td>0.8176</td>
</tr>
<tr>
<td>170/166</td>
<td>0.4316</td>
</tr>
</tbody>
</table>

**Atomic weight**

<table>
<thead>
<tr>
<th>Mass no.</th>
<th>162/166</th>
</tr>
</thead>
<tbody>
<tr>
<td>164/166</td>
<td>10.248</td>
</tr>
<tr>
<td>167/166</td>
<td>167.286 (6)</td>
</tr>
</tbody>
</table>

**Error**

| Mass no. | NS | P | P | NS |

**Annotation**

---

<table>
<thead>
<tr>
<th>Mass no.</th>
<th>Nuclidic mass</th>
<th>81HOLI</th>
<th>83CICAL</th>
</tr>
</thead>
<tbody>
<tr>
<td>162</td>
<td>161.928787</td>
<td>0.137 (1)</td>
<td>0.14 (1)</td>
</tr>
<tr>
<td>164</td>
<td>163.929211</td>
<td>1.609 (5)</td>
<td>1.61 (4)</td>
</tr>
<tr>
<td>166</td>
<td>165.930305</td>
<td>33.61 (7)</td>
<td>33.6 (2)</td>
</tr>
<tr>
<td>167</td>
<td>166.932061</td>
<td>22.93 (5)</td>
<td>22.95 (13)</td>
</tr>
<tr>
<td>168</td>
<td>167.932383</td>
<td>26.79 (7)</td>
<td>26.8 (2)</td>
</tr>
<tr>
<td>I/U 169/166b</td>
<td>14.93 (5)</td>
<td>14.9 (1)</td>
<td></td>
</tr>
</tbody>
</table>

Isotope ratio 162/166 164/166 167/166 168/166 170/166
| 0.00408 | 0.0389 | 0.63927 | 0.7971 | 0.4442 |
| 0.00417 | 0.0479 | 0.63920 | 0.7976 | 0.4435 |

Atomic weight 167.257 (2) 167.256 (4)
Error 2XSD
Annotation B

---

Element 69Tm Thulium

<table>
<thead>
<tr>
<th>Mass no.</th>
<th>Nuclidic mass</th>
<th>50LAGI</th>
<th>57COL1</th>
<th>83CICAL</th>
</tr>
</thead>
<tbody>
<tr>
<td>169</td>
<td>168.934225</td>
<td>100</td>
<td>100</td>
<td>100</td>
</tr>
</tbody>
</table>

Isotope ratio

Atomic weight 168.93423 (4) 168.93423 (4) 168.93423 (4)
Error NS NS
Annotation

---

### ISOTOPIC ABUNDANCES AND ATOMIC WEIGHTS OF THE ELEMENTS

**Element** 70Yb  **Ytterbium**

<table>
<thead>
<tr>
<th>Mass no.</th>
<th>Nuclidic mass</th>
<th>41WA11</th>
<th>49HAY1</th>
<th>50LE11</th>
<th>57CO11</th>
</tr>
</thead>
<tbody>
<tr>
<td>169</td>
<td>167,9350900</td>
<td>0.00</td>
<td>0.110</td>
<td>0.120</td>
<td>0.120</td>
</tr>
<tr>
<td>170</td>
<td>169,934774</td>
<td>4.21</td>
<td>3.034</td>
<td>3.03</td>
<td>3.14</td>
</tr>
<tr>
<td>171</td>
<td>170,936338</td>
<td>14.26</td>
<td>14.34</td>
<td>14.27</td>
<td>14.4</td>
</tr>
<tr>
<td>172</td>
<td>171,936393</td>
<td>21.49</td>
<td>21.88</td>
<td>21.77</td>
<td>21.9</td>
</tr>
<tr>
<td>173</td>
<td>172,938222</td>
<td>17.02</td>
<td>16.18</td>
<td>16.08</td>
<td>16.2</td>
</tr>
<tr>
<td>174</td>
<td>173,938873</td>
<td>29.58</td>
<td>31.77</td>
<td>31.91</td>
<td>31.6</td>
</tr>
<tr>
<td>176</td>
<td>175,942576</td>
<td>13.38</td>
<td>12.65</td>
<td>12.80</td>
<td>12.6</td>
</tr>
</tbody>
</table>

**Isotope ratio** 168/174

<table>
<thead>
<tr>
<th></th>
<th>0.00203</th>
<th>0.00441</th>
<th>0.00407</th>
<th>0.00427</th>
</tr>
</thead>
<tbody>
<tr>
<td>170/174</td>
<td>0.1423</td>
<td>0.0955</td>
<td>0.0950</td>
<td>0.0994</td>
</tr>
<tr>
<td>171/174</td>
<td>0.4620</td>
<td>0.4514</td>
<td>0.4472</td>
<td>0.4557</td>
</tr>
<tr>
<td>172/174</td>
<td>0.7264</td>
<td>0.6887</td>
<td>0.6922</td>
<td>0.6930</td>
</tr>
<tr>
<td>173/174</td>
<td>0.5753</td>
<td>0.5093</td>
<td>0.5039</td>
<td>0.5126</td>
</tr>
<tr>
<td>176/174</td>
<td>0.4522</td>
<td>0.3982</td>
<td>0.4011</td>
<td>0.3907</td>
</tr>
</tbody>
</table>

**Atomic weight**

<table>
<thead>
<tr>
<th></th>
<th>173.0050 (7)</th>
<th>173.031 (6)</th>
<th>173.041 (6)</th>
<th>173.024 (6)</th>
</tr>
</thead>
</table>

**Error**

<table>
<thead>
<tr>
<th></th>
<th>173.0050 (7)</th>
<th>173.031 (6)</th>
<th>173.041 (6)</th>
<th>173.024 (6)</th>
</tr>
</thead>
</table>

**Annotation**

<table>
<thead>
<tr>
<th></th>
<th>173.0050 (7)</th>
<th>173.031 (6)</th>
<th>173.041 (6)</th>
<th>173.024 (6)</th>
</tr>
</thead>
</table>

### Mass

<table>
<thead>
<tr>
<th>Mass no.</th>
<th>Nuclidic mass</th>
<th>66KOM1</th>
<th>77MCC1</th>
<th>81HOL1</th>
<th>83ICA1</th>
</tr>
</thead>
<tbody>
<tr>
<td>169</td>
<td>167,9350900</td>
<td>0.22</td>
<td>1.16</td>
<td>1.12</td>
<td>1.17</td>
</tr>
<tr>
<td>170</td>
<td>169,934774</td>
<td>3.43</td>
<td>3.06</td>
<td>3.04</td>
<td>3.05</td>
</tr>
<tr>
<td>171</td>
<td>170,936338</td>
<td>14.06</td>
<td>14.33</td>
<td>14.28</td>
<td>14.3</td>
</tr>
<tr>
<td>172</td>
<td>171,936393</td>
<td>21.82</td>
<td>21.87</td>
<td>21.83</td>
<td>21.9</td>
</tr>
<tr>
<td>174</td>
<td>173,938873</td>
<td>31.53</td>
<td>31.77</td>
<td>31.83</td>
<td>31.8</td>
</tr>
<tr>
<td>176</td>
<td>175,942576</td>
<td>12.86</td>
<td>12.69</td>
<td>12.76</td>
<td>12.7</td>
</tr>
</tbody>
</table>

**Isotope ratio** 169/174

<table>
<thead>
<tr>
<th></th>
<th>0.00070</th>
<th>0.00029 (5)</th>
<th>0.00029</th>
<th>0.00029</th>
</tr>
</thead>
<tbody>
<tr>
<td>170/174</td>
<td>0.1088</td>
<td>0.0966 (1)</td>
<td>0.0955</td>
<td>0.0958</td>
</tr>
<tr>
<td>171/174</td>
<td>0.4459</td>
<td>0.4512</td>
<td>0.4486</td>
<td>0.4497</td>
</tr>
<tr>
<td>172/174</td>
<td>0.6920</td>
<td>0.6887 (4)</td>
<td>0.6888</td>
<td>0.6887</td>
</tr>
<tr>
<td>173/174</td>
<td>0.5090</td>
<td>0.5075 (3)</td>
<td>0.5068</td>
<td>0.5069</td>
</tr>
<tr>
<td>176/174</td>
<td>0.4409</td>
<td>0.3997 (2)</td>
<td>0.4095</td>
<td>0.3994</td>
</tr>
</tbody>
</table>

**Atomic weight**

<table>
<thead>
<tr>
<th></th>
<th>173.02 (1)</th>
<th>173.0327 (3)</th>
<th>173.038 (3)</th>
<th>173.034 (7)</th>
</tr>
</thead>
</table>

**Error**

<table>
<thead>
<tr>
<th></th>
<th>173.02 (1)</th>
<th>173.0327 (3)</th>
<th>173.038 (3)</th>
<th>173.034 (7)</th>
</tr>
</thead>
</table>

**Annotation**

|            | 173.02 (1) | 173.0327 (3) | 173.038 (3) | 173.034 (7) |

---

### Element \(^{71}\)Lu Lutetium

<table>
<thead>
<tr>
<th>Mass no.</th>
<th>Nuclidic mass</th>
<th>39MAT2</th>
<th>50HAY1</th>
<th>57COL1</th>
<th>76MCC1</th>
</tr>
</thead>
<tbody>
<tr>
<td>175</td>
<td>174.940780</td>
<td>97.400 (5)(^c)</td>
<td>97.40 (2)</td>
<td>97.418 (13)</td>
<td>97.322 (5)</td>
</tr>
<tr>
<td>176</td>
<td>175.942694</td>
<td>2.515 (67)(^c)</td>
<td>2.60 (3)</td>
<td>2.588 (13)</td>
<td>2.607 (5)</td>
</tr>
<tr>
<td>Isotope ratio 176/175</td>
<td>0.0258 (7)</td>
<td>0.02669</td>
<td>0.02657</td>
<td>0.02677 (5)</td>
<td></td>
</tr>
<tr>
<td>Atomic weight</td>
<td>174.9660 (7)</td>
<td>174.9668 (3)</td>
<td>174.9667 (1)</td>
<td>174.96690 (5)</td>
<td></td>
</tr>
<tr>
<td>Error</td>
<td>NS</td>
<td>P</td>
<td>SD</td>
<td>2XSD</td>
<td></td>
</tr>
<tr>
<td>Annotation</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Mass no.</th>
<th>Nuclidic mass</th>
<th>81HOL1</th>
<th>83PAT1</th>
<th>83ICA1</th>
</tr>
</thead>
<tbody>
<tr>
<td>175</td>
<td>174.940785</td>
<td>97.41 (2)</td>
<td>97.416 (5)(^c)</td>
<td>97.41 (2)</td>
</tr>
<tr>
<td>176</td>
<td>175.942694</td>
<td>2.59 (2)</td>
<td>2.584 (5)(^c)</td>
<td>2.59 (2)</td>
</tr>
<tr>
<td>Isotope ratio 176/175</td>
<td>0.02659</td>
<td>0.026525 (20)</td>
<td>0.02699</td>
<td></td>
</tr>
<tr>
<td>Atomic weight</td>
<td>174.9667 (2)</td>
<td>174.96667 (5)</td>
<td>174.9667 (2)</td>
<td></td>
</tr>
<tr>
<td>Error</td>
<td>2XSD</td>
<td>2XSD</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Annotation</td>
<td>R</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### Element \(^{72}\)Hf Hfniun

<table>
<thead>
<tr>
<th>Mass no.</th>
<th>Nuclidic mass</th>
<th>43MAT1</th>
<th>49HI32</th>
<th>53REY1</th>
<th>56NH11</th>
</tr>
</thead>
<tbody>
<tr>
<td>174</td>
<td>173.940065</td>
<td>0.18 (1)</td>
<td>0.18 (1)</td>
<td>0.199</td>
<td>0.003 -0.010</td>
</tr>
<tr>
<td>176</td>
<td>175.941420</td>
<td>5.30 (11)</td>
<td>5.15 (2)</td>
<td>5.23 (5)</td>
<td>5.21 (2)</td>
</tr>
<tr>
<td>177</td>
<td>176.943233</td>
<td>18.47 (9)</td>
<td>18.39 (1)</td>
<td>18.55 (17)</td>
<td>18.56 (6)</td>
</tr>
<tr>
<td>178</td>
<td>177.943710</td>
<td>27.13 (14)</td>
<td>27.08 (4)</td>
<td>27.23 (22)</td>
<td>27.10 (10)</td>
</tr>
<tr>
<td>179</td>
<td>178.945827</td>
<td>13.85 (7)</td>
<td>13.78 (2)</td>
<td>13.73 (13)</td>
<td>13.75 (5)</td>
</tr>
<tr>
<td>180</td>
<td>179.946561</td>
<td>35.14 (18)</td>
<td>35.44 (6)</td>
<td>35.07 (24)</td>
<td>35.22 (10)</td>
</tr>
<tr>
<td>Isotope ratio 176/180</td>
<td>0.000300</td>
<td>0.000300</td>
<td>0.000597</td>
<td>0.000603</td>
<td></td>
</tr>
<tr>
<td>176/180</td>
<td>0.1509</td>
<td>0.1453</td>
<td>0.1491</td>
<td>0.1479</td>
<td></td>
</tr>
<tr>
<td>177/180</td>
<td>0.5260</td>
<td>0.5189</td>
<td>0.5289</td>
<td>0.5270</td>
<td></td>
</tr>
<tr>
<td>178/180</td>
<td>0.7715</td>
<td>0.7641</td>
<td>0.7765</td>
<td>0.7695</td>
<td></td>
</tr>
<tr>
<td>179/180</td>
<td>0.3944</td>
<td>0.3988</td>
<td>0.3915</td>
<td>0.3904</td>
<td></td>
</tr>
<tr>
<td>Atomic weight</td>
<td>178.488 (4)</td>
<td>178.497 (1)</td>
<td>178.485 (5)</td>
<td>178.491 (2)</td>
<td></td>
</tr>
<tr>
<td>Error</td>
<td>P</td>
<td>SD</td>
<td>P</td>
<td>NS</td>
<td></td>
</tr>
<tr>
<td>Annotation</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

---

### ISOTOPIC ABUNDANCES AND ATOMIC WEIGHTS OF THE ELEMENTS

**Element $^{72}$Hf Hafnium--continued**

<table>
<thead>
<tr>
<th>Mass no.</th>
<th>Nuclidic mass</th>
<th>75TAM1</th>
<th>83PAT1</th>
<th>83ICA1</th>
</tr>
</thead>
<tbody>
<tr>
<td>174</td>
<td>173.940065</td>
<td>0.155 (1)$^C$</td>
<td>0.1621 (9)</td>
<td>0.162 (2)</td>
</tr>
<tr>
<td>176</td>
<td>175.941420</td>
<td>5.193 (19)$^C$</td>
<td>5.2056 (12)</td>
<td>5.206 (4)</td>
</tr>
<tr>
<td>177</td>
<td>176.943233</td>
<td>18.484 (37)$^C$</td>
<td>18.6060 (13)</td>
<td>18.606 (3)</td>
</tr>
<tr>
<td>178</td>
<td>177.943710</td>
<td>27.261 (27)$^C$</td>
<td>27.2969 (13)</td>
<td>27.297 (3)</td>
</tr>
<tr>
<td>180</td>
<td>179.946561</td>
<td>35.255 (1)$^a$</td>
<td>35.1005 (22)</td>
<td>35.100 (5)</td>
</tr>
<tr>
<td>Isotope ratio 174/180</td>
<td>0.00438 (1)</td>
<td>0.004618</td>
<td>0.00455</td>
<td></td>
</tr>
<tr>
<td>176/180</td>
<td>0.1473 (4)</td>
<td>0.148306</td>
<td>0.1477</td>
<td></td>
</tr>
<tr>
<td>177/180</td>
<td>0.5263 (15)</td>
<td>0.530079</td>
<td>0.5304</td>
<td></td>
</tr>
<tr>
<td>179/180</td>
<td>0.7733 (23)</td>
<td>0.777678</td>
<td>0.7699</td>
<td></td>
</tr>
<tr>
<td>180/180</td>
<td>0.3872 (1)</td>
<td>0.388282</td>
<td>0.3903</td>
<td></td>
</tr>
</tbody>
</table>

Atomic weight | 178.4915 (8) | 178.48643 (7) | 178.490 (9) |
Error NS NS NS

Annotation B

---

### Element $^{181}$Ta Tantalum

<table>
<thead>
<tr>
<th>Mass no.</th>
<th>Nuclidic mass</th>
<th>55WHI1</th>
<th>56WHI1</th>
<th>58PAL1</th>
<th>83ICA1</th>
</tr>
</thead>
<tbody>
<tr>
<td>180</td>
<td>179.947489</td>
<td>0.0123 (3)</td>
<td>0.0123 (3)</td>
<td>0.0117 (6)</td>
<td>0.012 (2)</td>
</tr>
<tr>
<td>181</td>
<td>180.948014</td>
<td>99.988</td>
<td>99.9877 (3)</td>
<td>99.9883 (6)</td>
<td>99.988 (2)</td>
</tr>
<tr>
<td>Isotope ratio 180/181</td>
<td>0.0001230</td>
<td>0.0001233</td>
<td>0.0001170</td>
<td>0.0001200</td>
<td></td>
</tr>
</tbody>
</table>

Atomic weight | 180.947891 (3) | 180.947891 (3) | 180.947897 (6) | 180.94789 (2) |
Error NS NS NS

Annotation B

---

### Element 74W Tungsten

<table>
<thead>
<tr>
<th>Mass no.</th>
<th>Nuclidic mass</th>
<th>46EIN1</th>
<th>46WH11</th>
<th>48MAT1</th>
<th>48WH11</th>
</tr>
</thead>
<tbody>
<tr>
<td>180</td>
<td>179.946727</td>
<td>0.122  (2)</td>
<td>0.130 (2)</td>
<td>0.160 (4)</td>
<td>0.125 (6)</td>
</tr>
<tr>
<td>182</td>
<td>181.948225</td>
<td>25.77 (30)</td>
<td>26.41 (53)</td>
<td>26.35 (8)</td>
<td>26.31 (3)</td>
</tr>
<tr>
<td>184</td>
<td>182.950245</td>
<td>14.24 (20)</td>
<td>14.40 (29)</td>
<td>14.30 (11)</td>
<td>14.20 (1)</td>
</tr>
<tr>
<td>186</td>
<td>184.950953</td>
<td>30.68 (30)</td>
<td>30.64 (61)</td>
<td>30.68 (12)</td>
<td>30.64 (3)</td>
</tr>
<tr>
<td>188</td>
<td>186.954377</td>
<td>29.17 (30)</td>
<td>28.41 (57)</td>
<td>28.49 (9)</td>
<td>28.64 (1)</td>
</tr>
<tr>
<td>Isotope ratio 180/183</td>
<td>0.00857</td>
<td>0.00090</td>
<td>0.01117</td>
<td>0.00882</td>
<td></td>
</tr>
<tr>
<td></td>
<td>182/183</td>
<td>1.8097</td>
<td>1.834</td>
<td>1.8401</td>
<td>1.8424</td>
</tr>
<tr>
<td></td>
<td>184/183</td>
<td>2.1545</td>
<td>2.126</td>
<td>2.1425</td>
<td>2.1457</td>
</tr>
<tr>
<td></td>
<td>186/184/185</td>
<td>2.0804</td>
<td>1.977</td>
<td>1.8857</td>
<td>2.0056</td>
</tr>
<tr>
<td>Atomic weight</td>
<td>183.872 (6)</td>
<td>183.84 (2)</td>
<td>183.844 (3)</td>
<td>183.8498 (7)</td>
<td></td>
</tr>
<tr>
<td>Error</td>
<td>P</td>
<td>P</td>
<td>NS</td>
<td>SE</td>
<td></td>
</tr>
<tr>
<td>Annotation</td>
<td></td>
<td>B</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Mass no.</th>
<th>Nuclidic mass</th>
<th>49HIB2</th>
<th>600MUL</th>
<th>83ICA1</th>
</tr>
</thead>
<tbody>
<tr>
<td>180</td>
<td>179.946727</td>
<td>0.143  (2)</td>
<td>0.116 (10)</td>
<td>0.13 (3)</td>
</tr>
<tr>
<td>182</td>
<td>181.948225</td>
<td>26.09 (12)</td>
<td>26.47 (12)</td>
<td>26.3 (2)</td>
</tr>
<tr>
<td>184</td>
<td>182.950245</td>
<td>14.24 (2)</td>
<td>14.27 (7)</td>
<td>14.3 (1)</td>
</tr>
<tr>
<td>186</td>
<td>184.950953</td>
<td>30.68 (1)</td>
<td>30.62 (9)</td>
<td>30.67 (15)</td>
</tr>
<tr>
<td>Isotope ratio 180/183</td>
<td>0.0100</td>
<td>0.00013</td>
<td>0.00009</td>
<td>0.00009</td>
</tr>
<tr>
<td></td>
<td>182/183</td>
<td>1.8322</td>
<td>1.8349</td>
<td>1.8392</td>
</tr>
<tr>
<td></td>
<td>184/183</td>
<td>2.1545</td>
<td>2.1458</td>
<td>2.1448</td>
</tr>
<tr>
<td></td>
<td>186/184/185</td>
<td>2.0260</td>
<td>2.0007</td>
<td>2.0000</td>
</tr>
<tr>
<td>Atomic weight</td>
<td>183.95803 (3)</td>
<td>183.945 (2)</td>
<td>183.949 (5)</td>
<td></td>
</tr>
<tr>
<td>Error</td>
<td>SD</td>
<td>NS</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Annotation</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### Element 72Re Rhenium

<table>
<thead>
<tr>
<th>Mass no.</th>
<th>Nuclidic mass</th>
<th>47HES1</th>
<th>48WH11</th>
<th>73GRA1</th>
<th>83ICA1</th>
</tr>
</thead>
<tbody>
<tr>
<td>185</td>
<td>184.952977</td>
<td>37.244 (69)</td>
<td>37.07 (6)</td>
<td>37.398 (16)</td>
<td>37.40 (2)</td>
</tr>
<tr>
<td>187</td>
<td>186.957665</td>
<td>62.756 (69)</td>
<td>62.93 (6)</td>
<td>62.602 (16)</td>
<td>62.60 (2)</td>
</tr>
<tr>
<td>Isotope ratio 185/187</td>
<td>0.5935 (18)</td>
<td>0.5891</td>
<td>0.59738 (39)</td>
<td>0.59744</td>
<td></td>
</tr>
<tr>
<td>Atomic weight</td>
<td>186.210 (1)</td>
<td>186.213 (1)</td>
<td>186.2068 (3)</td>
<td>186.2068 (3)</td>
<td></td>
</tr>
<tr>
<td>Error</td>
<td>NS</td>
<td>SE</td>
<td>3XSD</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Annotation</td>
<td>C, B</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
### ISOTOPIC ABUNDANCES AND ATOMIC WEIGTHS OF THE ELEMENTS

**Element 76Os Osmium**

<table>
<thead>
<tr>
<th>Mass no.</th>
<th>Nuclidic mass</th>
<th>37NIE1</th>
<th>83ICA1</th>
</tr>
</thead>
<tbody>
<tr>
<td>184</td>
<td>183.952514</td>
<td>0.018 (2)</td>
<td>0.02 (1)</td>
</tr>
<tr>
<td>186</td>
<td>185.953652</td>
<td>1.59 (5)</td>
<td>1.56 (10)</td>
</tr>
<tr>
<td>187</td>
<td>186.955762</td>
<td>1.64 (5)</td>
<td>1.6 (1)</td>
</tr>
<tr>
<td>188</td>
<td>187.956850</td>
<td>13.27 (11)</td>
<td>13.3 (2)</td>
</tr>
<tr>
<td>189</td>
<td>188.958156</td>
<td>16.14 (15)</td>
<td>16.1 (3)</td>
</tr>
<tr>
<td>192</td>
<td>191.961487</td>
<td>40.96 (14)</td>
<td>41.0 (3)</td>
</tr>
</tbody>
</table>

Isotope ratio 184/188 0.009 0.0015
186/188 0.120 0.119
187/188 0.124 0.120
189/188 1.216 1.210
190/188 1.988 1.985
192/190 3.007 3.003

Atomic weight 190.238 (5) 190.24 (1)

Error P

**Element 77Ir Iridium**

<table>
<thead>
<tr>
<th>Mass no.</th>
<th>Nuclidic mass</th>
<th>54BAL1</th>
<th>83ICA1</th>
</tr>
</thead>
<tbody>
<tr>
<td>191</td>
<td>190.960603</td>
<td>37.3</td>
<td>37.3 (5)</td>
</tr>
<tr>
<td>193</td>
<td>192.962942</td>
<td>62.7</td>
<td>62.7 (5)</td>
</tr>
</tbody>
</table>

Isotope ratio 191/193 0.5949 0.5949

Atomic weight 192.216 (2) 192.22 (1)

Error NS

**Annotation** B

---

### Element Pt Platinum

<table>
<thead>
<tr>
<th>Mass no.</th>
<th>Nuclidic mass</th>
<th>47ING3</th>
<th>56WHII</th>
<th>83ICA1</th>
</tr>
</thead>
<tbody>
<tr>
<td>190</td>
<td>188.959937</td>
<td>0.00</td>
<td>0.0127 (5)</td>
<td>0.01 (1)</td>
</tr>
<tr>
<td>192</td>
<td>191.961049</td>
<td>0.78</td>
<td>0.78 (1)</td>
<td>0.79 (5)</td>
</tr>
<tr>
<td>194</td>
<td>193.962679</td>
<td>32.8</td>
<td>32.9 (1)</td>
<td>32.9 (5)</td>
</tr>
<tr>
<td>195</td>
<td>194.964785</td>
<td>33.7</td>
<td>33.8 (1)</td>
<td>33.8 (5)</td>
</tr>
<tr>
<td>196</td>
<td>195.964947</td>
<td>25.4</td>
<td>25.2 (1)</td>
<td>25.3 (5)</td>
</tr>
<tr>
<td>198</td>
<td>197.967879</td>
<td>7.23</td>
<td>7.19 (4)</td>
<td>7.2 (2)</td>
</tr>
</tbody>
</table>

Isotope ratio 190/195 0.0027 0.000376 0.00030
192/195 0.0231 0.02308 0.02237
194/195 0.9733 0.9734 0.9734
196/195 0.7537 0.7456 0.7485
198/195 0.2145 0.2127 0.2130

Atomic weight 195.079 (2) 195.079 (2) 195.080 (9)

Error NS NS

Annotation B

### Element Au Gold

<table>
<thead>
<tr>
<th>Mass no.</th>
<th>Nuclidic mass</th>
<th>63LEII</th>
<th>83ICA1</th>
</tr>
</thead>
<tbody>
<tr>
<td>197</td>
<td>196.966560</td>
<td>100</td>
<td>100</td>
</tr>
</tbody>
</table>

Isotope ratio

Atomic weight 196.96656 (3) 196.96656 (4)

Error NS

Annotation
### ISOTOPIC ABUNDANCES AND ATOMIC WEIGHTS OF THE ELEMENTS

**Element 80Hg Mercury**

<table>
<thead>
<tr>
<th>Mass no.</th>
<th>Nuclidic mass</th>
<th>47ING1</th>
<th>49HIB2</th>
<th>50NIE2</th>
<th>50NIE2</th>
</tr>
</thead>
<tbody>
<tr>
<td>196</td>
<td>195.965812</td>
<td>0.155</td>
<td>0.16 (3)</td>
<td>0.147 (4)</td>
<td>0.146 (20) C</td>
</tr>
<tr>
<td>198</td>
<td>197.966760</td>
<td>10.12</td>
<td>10.02 (6)</td>
<td>10.067 (101)</td>
<td>10.018 (9) C</td>
</tr>
<tr>
<td>199</td>
<td>198.968269</td>
<td>17.01</td>
<td>16.92 (7)</td>
<td>17.000 (170)</td>
<td>16.837 (15) C</td>
</tr>
<tr>
<td>200</td>
<td>199.968316</td>
<td>23.21</td>
<td>23.10 (8)</td>
<td>23.050 (230)</td>
<td>23.127 (15) C</td>
</tr>
<tr>
<td>204</td>
<td>203.973481</td>
<td>6.69</td>
<td>6.84 (6)</td>
<td>6.781 (68)</td>
<td>6.851 (5) C</td>
</tr>
</tbody>
</table>

**Isotope ratio**

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>196/202</td>
<td>0.0057</td>
<td>0.0054</td>
<td>0.000404</td>
<td>0.000497</td>
<td></td>
<td></td>
</tr>
<tr>
<td>198/202</td>
<td>0.3412</td>
<td>0.3372</td>
<td>0.3386</td>
<td>0.3362 (3)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>199/202</td>
<td>0.5735</td>
<td>0.5693</td>
<td>0.5718</td>
<td>0.5650 (5)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>200/202</td>
<td>0.7825</td>
<td>0.7773</td>
<td>0.7753</td>
<td>0.7761 (5)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>201/202</td>
<td>0.4434</td>
<td>0.4448</td>
<td>0.4448</td>
<td>0.4437 (6)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>204/202</td>
<td>0.2426</td>
<td>0.2301</td>
<td>0.2291</td>
<td>0.2299 (2)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Atomic weight**

<table>
<thead>
<tr>
<th>Mass no.</th>
<th>50D1B1</th>
<th>83ICA1</th>
</tr>
</thead>
<tbody>
<tr>
<td>196</td>
<td>0.156 (1)</td>
<td>0.14 (10)</td>
</tr>
<tr>
<td>198</td>
<td>0.12 (10)</td>
<td>10.02 (7)</td>
</tr>
<tr>
<td>199</td>
<td>16.99 (9)</td>
<td>16.84 (11)</td>
</tr>
<tr>
<td>200</td>
<td>23.07 (12)</td>
<td>23.13 (11)</td>
</tr>
<tr>
<td>201</td>
<td>13.27 (7)</td>
<td>13.22 (11)</td>
</tr>
<tr>
<td>204</td>
<td>6.97 (5)</td>
<td>6.85 (5)</td>
</tr>
</tbody>
</table>

**Isotope ratio**

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>196/202</td>
<td>0.005263</td>
<td>0.004466</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>198/202</td>
<td>0.3414</td>
<td>0.3406</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>199/202</td>
<td>0.5732</td>
<td>0.5734</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>200/202</td>
<td>0.7783</td>
<td>0.7791</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>201/202</td>
<td>0.4477</td>
<td>0.4452</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>204/202</td>
<td>0.2291</td>
<td>0.2293</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Atomic weight**

<table>
<thead>
<tr>
<th>Mass no.</th>
<th>50D1B1</th>
<th>83ICA1</th>
</tr>
</thead>
<tbody>
<tr>
<td>196</td>
<td>0.156 (1)</td>
<td>0.14 (10)</td>
</tr>
<tr>
<td>198</td>
<td>0.12 (10)</td>
<td>10.02 (7)</td>
</tr>
<tr>
<td>199</td>
<td>16.99 (9)</td>
<td>16.84 (11)</td>
</tr>
<tr>
<td>200</td>
<td>23.07 (12)</td>
<td>23.13 (11)</td>
</tr>
<tr>
<td>201</td>
<td>13.27 (7)</td>
<td>13.22 (11)</td>
</tr>
<tr>
<td>204</td>
<td>6.97 (5)</td>
<td>6.85 (5)</td>
</tr>
</tbody>
</table>

**Isotope ratio**

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>196/202</td>
<td>0.005263</td>
<td>0.004466</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>198/202</td>
<td>0.3414</td>
<td>0.3406</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>199/202</td>
<td>0.5732</td>
<td>0.5734</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>200/202</td>
<td>0.7783</td>
<td>0.7791</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>201/202</td>
<td>0.4477</td>
<td>0.4452</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>204/202</td>
<td>0.2291</td>
<td>0.2293</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Atomic weight**

<table>
<thead>
<tr>
<th>Mass no.</th>
<th>50D1B1</th>
<th>83ICA1</th>
</tr>
</thead>
<tbody>
<tr>
<td>196</td>
<td>0.156 (1)</td>
<td>0.14 (10)</td>
</tr>
<tr>
<td>198</td>
<td>0.12 (10)</td>
<td>10.02 (7)</td>
</tr>
<tr>
<td>199</td>
<td>16.99 (9)</td>
<td>16.84 (11)</td>
</tr>
<tr>
<td>200</td>
<td>23.07 (12)</td>
<td>23.13 (11)</td>
</tr>
<tr>
<td>201</td>
<td>13.27 (7)</td>
<td>13.22 (11)</td>
</tr>
<tr>
<td>204</td>
<td>6.97 (5)</td>
<td>6.85 (5)</td>
</tr>
</tbody>
</table>
### Element \textsuperscript{81}Tl Thallium

<table>
<thead>
<tr>
<th>Mass no.</th>
<th>Nuclidic mass</th>
<th>38NIE1</th>
<th>48PAU1</th>
<th>48WH11</th>
<th>49HIB2</th>
</tr>
</thead>
<tbody>
<tr>
<td>203</td>
<td>202.972336</td>
<td>29.08 (40)(^C)</td>
<td>30.07 (49)</td>
<td>29.46 (5)</td>
<td>29.52 (5)</td>
</tr>
<tr>
<td>205</td>
<td>204.974410</td>
<td>10.92 (40)(^C)</td>
<td>69.93 (49)</td>
<td>70.54 (5)</td>
<td>70.48 (7)</td>
</tr>
<tr>
<td>Isotope ratio 203/205</td>
<td>0.410 (8)</td>
<td>0.4300</td>
<td>0.4176</td>
<td>0.4186</td>
<td></td>
</tr>
<tr>
<td>Atomic weight</td>
<td>204.393 (8)</td>
<td>204.37 (1)</td>
<td>204.385 (1)</td>
<td>204.383 (1)</td>
<td></td>
</tr>
<tr>
<td>Error</td>
<td>NS</td>
<td>3XSD</td>
<td>P</td>
<td>SD</td>
<td></td>
</tr>
</tbody>
</table>

### Element \textsuperscript{82}Pb Lead

<table>
<thead>
<tr>
<th>Mass no.</th>
<th>Nuclidic mass</th>
<th>38NIE3</th>
<th>38NIE3</th>
<th>41NIE1</th>
<th>41NIE1</th>
</tr>
</thead>
<tbody>
<tr>
<td>204</td>
<td>203.973037</td>
<td>1.48</td>
<td>1.26</td>
<td>1.544 (19)(^C)</td>
<td>1.230 (15)(^C)</td>
</tr>
<tr>
<td>205</td>
<td>205.974455</td>
<td>23.59</td>
<td>27.31</td>
<td>22.61 (43)(^C)</td>
<td>27.47 (50)(^C)</td>
</tr>
<tr>
<td>207</td>
<td>206.975885</td>
<td>22.64</td>
<td>20.00</td>
<td>22.62 (43)(^C)</td>
<td>19.87 (39)(^C)</td>
</tr>
<tr>
<td>208</td>
<td>207.976641</td>
<td>52.29</td>
<td>51.43</td>
<td>53.23 (60)(^C)</td>
<td>51.43 (61)(^C)</td>
</tr>
<tr>
<td>Isotope ratio 204/206</td>
<td>0.0667</td>
<td>0.0461</td>
<td>0.0683</td>
<td>0.0448</td>
<td></td>
</tr>
<tr>
<td>207/206</td>
<td>0.9597</td>
<td>0.7233</td>
<td>1.0004</td>
<td>0.7233</td>
<td></td>
</tr>
<tr>
<td>208/206</td>
<td>2.2186</td>
<td>1.8832</td>
<td>2.3543</td>
<td>1.8722</td>
<td></td>
</tr>
<tr>
<td>Atomic weight</td>
<td>207.2185 (4)</td>
<td>207.1792 (4)</td>
<td>207.236 (7)</td>
<td>207.179 (8)</td>
<td></td>
</tr>
<tr>
<td>Error</td>
<td>P</td>
<td>NS</td>
<td>P</td>
<td>P</td>
<td></td>
</tr>
</tbody>
</table>

**Annotation**

\(C, B\)

---

### ISOTOPIC ABUNDANCES AND ATOMIC WEIGHTS OF THE ELEMENTS

**82Pb Lead--continued**

<table>
<thead>
<tr>
<th>Mass no.</th>
<th>Nuclidic mass</th>
<th>48HII1</th>
<th>50HII1</th>
<th>50HII1</th>
<th>52COL1</th>
</tr>
</thead>
<tbody>
<tr>
<td>204</td>
<td>203.973037</td>
<td>1.37 (14)</td>
<td>1.372 (16)</td>
<td>1.360 (5)</td>
<td>1.647 (10)</td>
</tr>
<tr>
<td>206</td>
<td>206.974455</td>
<td>25.15 (25)</td>
<td>26.24 (2)</td>
<td>26.29 (3)</td>
<td>20.84 (21)</td>
</tr>
<tr>
<td>207</td>
<td>206.975885</td>
<td>21.11 (21)</td>
<td>20.82 (3)</td>
<td>20.82 (4)</td>
<td>23.51 (22)</td>
</tr>
<tr>
<td>208</td>
<td>207.976641</td>
<td>52.38 (52)</td>
<td>51.57 (3)</td>
<td>51.53 (3)</td>
<td>54.00 (30)</td>
</tr>
</tbody>
</table>

**Isotope ratio 204/206**

<table>
<thead>
<tr>
<th></th>
<th>0.0545</th>
<th>0.0523</th>
<th>0.0517</th>
<th>0.0790</th>
<th>1.1281</th>
</tr>
</thead>
<tbody>
<tr>
<td>207/206</td>
<td>0.8394</td>
<td>0.7934</td>
<td>0.7919</td>
<td>1.1281</td>
<td>2.5571</td>
</tr>
<tr>
<td>202/206</td>
<td>2.0927</td>
<td>1.0660</td>
<td>1.0601</td>
<td>2.5571</td>
<td>1.995e-04</td>
</tr>
</tbody>
</table>

**Atomic weight**

<table>
<thead>
<tr>
<th></th>
<th>207.207 (5)</th>
<th>207.188 (6)</th>
<th>207.1875 (5)</th>
<th>207.258 (4)</th>
</tr>
</thead>
</table>

**Error**

|         | P           | 2XS          | 2XS          | P           |

**Annotation**

### 52COL1

<table>
<thead>
<tr>
<th>Mass no.</th>
<th>Nuclidic mass</th>
<th>52COL1</th>
<th>52DIB1</th>
<th>53ALL1</th>
<th>53ALL1</th>
</tr>
</thead>
<tbody>
<tr>
<td>204</td>
<td>203.973037</td>
<td>1.0400 (66)</td>
<td>1.32 (2)</td>
<td>1.52</td>
<td>1.65</td>
</tr>
<tr>
<td>206</td>
<td>206.974455</td>
<td>27.04 (25)</td>
<td>26.67 (20)</td>
<td>22.54</td>
<td>20.84</td>
</tr>
<tr>
<td>207</td>
<td>206.975885</td>
<td>17.62 (18)</td>
<td>20.50 (20)</td>
<td>22.70</td>
<td>23.51</td>
</tr>
<tr>
<td>208</td>
<td>207.976641</td>
<td>54.30 (30)</td>
<td>51.50 (30)</td>
<td>53.24</td>
<td>54.00</td>
</tr>
</tbody>
</table>

**Isotope ratio 204/206**

<table>
<thead>
<tr>
<th></th>
<th>0.0385</th>
<th>0.0495</th>
<th>0.0674</th>
<th>0.0792</th>
<th>1.1281</th>
</tr>
</thead>
<tbody>
<tr>
<td>207/206</td>
<td>0.6516</td>
<td>0.7687</td>
<td>1.0071</td>
<td>1.1281</td>
<td>2.291c</td>
</tr>
<tr>
<td>202/206</td>
<td>2.0927</td>
<td>1.0660</td>
<td>1.0601</td>
<td>2.5571</td>
<td>1.995e-04</td>
</tr>
</tbody>
</table>

**Atomic weight**

<table>
<thead>
<tr>
<th></th>
<th>207.217 (4)</th>
<th>207.185 (3)</th>
<th>207.2373 (4)</th>
<th>207.2580 (4)</th>
</tr>
</thead>
</table>

**Error**

|         | P           | P           | NS          | NS          |

**Annotation**

### 53EH11

<table>
<thead>
<tr>
<th>Mass no.</th>
<th>Nuclidic mass</th>
<th>53EH11</th>
<th>53EH11</th>
<th>53FAR1</th>
<th>53FAR1</th>
</tr>
</thead>
<tbody>
<tr>
<td>204</td>
<td>203.973037</td>
<td>1.3478 (60)c</td>
<td>1.3560 (51)c</td>
<td>1.440 (9)</td>
<td>1.456 (7)</td>
</tr>
<tr>
<td>206</td>
<td>206.974455</td>
<td>24.824 (64)c</td>
<td>25.158 (23)c</td>
<td>23.69 (2)</td>
<td>23.64 (5)</td>
</tr>
<tr>
<td>207</td>
<td>206.975885</td>
<td>21.448 (79)c</td>
<td>21.133 (60)c</td>
<td>22.54 (4)</td>
<td>22.61 (3)</td>
</tr>
<tr>
<td>208</td>
<td>207.976641</td>
<td>52.50 (12)c</td>
<td>52.354 (56)c</td>
<td>52.33 (4)</td>
<td>52.30 (7)</td>
</tr>
</tbody>
</table>

**Isotope ratio 204/206**

<table>
<thead>
<tr>
<th></th>
<th>0.0543 (2)</th>
<th>0.0539 (2)</th>
<th>0.0608</th>
<th>0.0615</th>
</tr>
</thead>
<tbody>
<tr>
<td>207/206</td>
<td>0.864 (3)</td>
<td>0.8400 (3)</td>
<td>0.9515</td>
<td>0.9564</td>
</tr>
<tr>
<td>208/206</td>
<td>2.110 (10)</td>
<td>7.0810 (2)</td>
<td>2.2089</td>
<td>2.2104</td>
</tr>
</tbody>
</table>

**Atomic weight**

<table>
<thead>
<tr>
<th></th>
<th>207.211 (1)</th>
<th>207.207 (5)</th>
<th>207.2191 (5)</th>
<th>207.2188 (8)</th>
</tr>
</thead>
</table>

**Error**

|         | NS           | NS           | SD          | SD          |

**Annotation**

<table>
<thead>
<tr>
<th>Mass no.</th>
<th>Nuclidic mass</th>
<th>54BEG1</th>
<th>54BEG1</th>
<th>54EH1</th>
<th>54EH1</th>
<th>54GE1</th>
</tr>
</thead>
<tbody>
<tr>
<td>204</td>
<td>203.973037</td>
<td>1.33</td>
<td>1.32</td>
<td>1.3528 (52)C</td>
<td>1.3999 (72)C</td>
<td>1.3517 (80)C</td>
</tr>
<tr>
<td>208</td>
<td>207.976641</td>
<td>0.98</td>
<td>0.95</td>
<td>0.9610 (34)C</td>
<td>0.9938 (10)C</td>
<td>0.9453 (59)C</td>
</tr>
<tr>
<td></td>
<td>207.970041</td>
<td>0.0523</td>
<td>0.0520</td>
<td>0.0541 (2)</td>
<td>0.0560 (2)</td>
<td>0.0537 (3)</td>
</tr>
<tr>
<td>Isotope ratio</td>
<td>207/206</td>
<td>0.8234</td>
<td>0.8235</td>
<td>0.851 (2)</td>
<td>0.8630 (2)</td>
<td>0.836 (2)</td>
</tr>
<tr>
<td>Atomic weight</td>
<td>207.2047 (4)</td>
<td>207.2065 (4)</td>
<td>207.2088 (6)</td>
<td>207.209 (2)</td>
<td>207.207 (1)</td>
<td></td>
</tr>
<tr>
<td>Error</td>
<td>NS</td>
<td>NS</td>
<td>NS</td>
<td>NS</td>
<td>NS</td>
<td>3XSD</td>
</tr>
</tbody>
</table>

**Annotation**

<table>
<thead>
<tr>
<th>Mass no.</th>
<th>Nuclidic mass</th>
<th>54GE1</th>
<th>54RUS1</th>
<th>54RUS1</th>
<th>55EBE1</th>
</tr>
</thead>
<tbody>
<tr>
<td>204</td>
<td>203.973037</td>
<td>1.3846 (55)C</td>
<td>1.43</td>
<td>1.64</td>
<td>1.3237 (52)C</td>
</tr>
<tr>
<td>207</td>
<td>206.975885</td>
<td>21.966 (67)C</td>
<td>22.77</td>
<td>23.52</td>
<td>20.962 (37)C</td>
</tr>
<tr>
<td>208</td>
<td>207.976641</td>
<td>2.037 (91)C</td>
<td>32.51</td>
<td>3.02</td>
<td>22.159 (53)C</td>
</tr>
<tr>
<td>Isotope ratio</td>
<td>207/206</td>
<td>0.0563 (2)</td>
<td>0.0514</td>
<td>0.0787</td>
<td>0.0520 (2)</td>
</tr>
<tr>
<td>Atomic weight</td>
<td>207.2080 (9)</td>
<td>207.2251 (4)</td>
<td>207.2584 (4)</td>
<td>207.2042 (6)</td>
<td></td>
</tr>
<tr>
<td>Error</td>
<td>3XSD</td>
<td>NS</td>
<td>NS</td>
<td>NS</td>
<td>3XSD</td>
</tr>
</tbody>
</table>

**Annotation**

<table>
<thead>
<tr>
<th>Mass no.</th>
<th>Nuclidic mass</th>
<th>55EBE1</th>
<th>55SAK1</th>
<th>55SAK1</th>
<th>56KUL1</th>
</tr>
</thead>
<tbody>
<tr>
<td>204</td>
<td>203.973037</td>
<td>1.6473 (42)C</td>
<td>1.37</td>
<td>1.34</td>
<td>1.21</td>
</tr>
<tr>
<td>206</td>
<td>205.974455</td>
<td>20.9707 (72)C</td>
<td>25.03</td>
<td>25.03</td>
<td>25.03</td>
</tr>
<tr>
<td>208</td>
<td>207.976641</td>
<td>53.750 (18)C</td>
<td>52.53</td>
<td>52.45</td>
<td>51.78</td>
</tr>
<tr>
<td>Isotope ratio</td>
<td>204/207</td>
<td>0.07855 (20)</td>
<td>0.0547</td>
<td>0.0535</td>
<td>0.0440</td>
</tr>
<tr>
<td>Atomic weight</td>
<td>207.2547 (2)</td>
<td>207.2098 (4)</td>
<td>207.2099 (4)</td>
<td>207.1825 (4)</td>
<td></td>
</tr>
<tr>
<td>Error</td>
<td>3XSD</td>
<td>NS</td>
<td>NS</td>
<td>NS</td>
<td>3XSD</td>
</tr>
</tbody>
</table>

**Annotation**

---

### Isotopic Abundances and Atomic Weights of the Elements

<table>
<thead>
<tr>
<th>Mass no.</th>
<th>Nuclidic mass</th>
<th>56KUI1</th>
<th>56WH11</th>
<th>57RUS1</th>
<th>57RUS1</th>
</tr>
</thead>
<tbody>
<tr>
<td>204</td>
<td>203.973037</td>
<td>1.35</td>
<td>1.40 (2)</td>
<td>1.64</td>
<td>1.07</td>
</tr>
<tr>
<td>206</td>
<td>205.974455</td>
<td>25.24</td>
<td>25.2 (1)</td>
<td>20.99</td>
<td>24.81</td>
</tr>
<tr>
<td>207</td>
<td>206.975885</td>
<td>21.12</td>
<td>21.7 (1)</td>
<td>23.57</td>
<td>17.91</td>
</tr>
<tr>
<td>208</td>
<td>207.976641</td>
<td>52.29</td>
<td>51.7 (2)</td>
<td>53.80</td>
<td>56.21</td>
</tr>
</tbody>
</table>

Isotope ratio 204/206

|        | 0.0535       | 0.0556 | 0.0781 | 0.0431 |
|---      | 0.8368       | 0.8611 | 1.1229 | 0.7219 |

Atomic weight 207.2059 (4) 207.199 (2) 207.2548 (4) 207.2578 (4)

Error

|        | NS | NS | NS | NS |

Annotation

<table>
<thead>
<tr>
<th>Mass no.</th>
<th>Nuclidic mass</th>
<th>58BEHRI</th>
<th>58BEHRI</th>
<th>58PAL1</th>
</tr>
</thead>
<tbody>
<tr>
<td>204</td>
<td>203.973037</td>
<td>1.396 (15)C</td>
<td>1.3569 (51)C</td>
<td>1.560 (15)</td>
</tr>
<tr>
<td>206</td>
<td>205.974455</td>
<td>24.577 (62)C</td>
<td>25.059 (21)C</td>
<td>22.50 (17)</td>
</tr>
<tr>
<td>208</td>
<td>207.976641</td>
<td>52.35 (12)C</td>
<td>52.397 (41)C</td>
<td>53.33</td>
</tr>
</tbody>
</table>

Isotope ratio 204/206

|        | 0.0566 (6)   | 0.0515 (2) | 0.0693 |
|---      | 0.8820 (25)  | 0.8455 (15) | 1.0049 |

Atomic weight 207.212 (1) 207.206 (4) 207.237 (3)

Error

|        | NS | NS | NS |

Annotation

<table>
<thead>
<tr>
<th>Mass no.</th>
<th>Nuclidic mass</th>
<th>58SAK1</th>
<th>58SAK1</th>
<th>58TIL1</th>
<th>58TIL1</th>
</tr>
</thead>
<tbody>
<tr>
<td>204</td>
<td>203.973037</td>
<td>1.3537 (30)C</td>
<td>1.3528 (30)C</td>
<td>1.3330 (67)C</td>
<td>1.3567 (77)C</td>
</tr>
<tr>
<td>208</td>
<td>207.976641</td>
<td>52.47 (11)C</td>
<td>52.46 (11)C</td>
<td>52.194 (56)C</td>
<td>52.17 (13)C</td>
</tr>
</tbody>
</table>

Isotope ratio 204/206

|        | 0.05402       | 0.05400 | 0.0524 (26) | 0.05391 (27) |
|---      | 0.84277       | 0.84342 | 0.8244 (41) | 0.8439 (42) |

Atomic weight 207.210 (1) 207.210 (1) 207.203 (6) 207.204 (1)

Error

|        | SE | SE | P | P |

Annotation

<table>
<thead>
<tr>
<th>Mass no.</th>
<th>Nuclidic mass</th>
<th>59FRI1</th>
<th>60CAT1</th>
<th>60CAT1</th>
<th>60KOL1</th>
</tr>
</thead>
<tbody>
<tr>
<td>204</td>
<td>203.973037</td>
<td>1.365</td>
<td>1.568</td>
<td>1.3658</td>
<td>1.4551</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(16)C</td>
<td>(13)C</td>
<td>(99)C</td>
<td>(15)C</td>
</tr>
<tr>
<td>206</td>
<td>205.974455</td>
<td>24.99</td>
<td>22.13</td>
<td>24.83</td>
<td>23.450</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(14)C</td>
<td>(32)C</td>
<td>(29)C</td>
<td>(11)C</td>
</tr>
<tr>
<td>207</td>
<td>206.975885</td>
<td>21.29</td>
<td>23.51</td>
<td>21.41</td>
<td>22.615</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(20)C</td>
<td>(32)C</td>
<td>(25)C</td>
<td>(19)C</td>
</tr>
<tr>
<td>208</td>
<td>207.976641</td>
<td>52.35</td>
<td>52.79</td>
<td>52.40</td>
<td>52.480</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(25)C</td>
<td>(42)C</td>
<td>(36)C</td>
<td>(23)C</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Isotope ratio</th>
<th>204/206</th>
<th>207/206</th>
<th>206/206</th>
</tr>
</thead>
<tbody>
<tr>
<td>204/206</td>
<td>0.05465</td>
<td>0.8320</td>
<td>1.0950</td>
</tr>
<tr>
<td>207/206</td>
<td>0.0708</td>
<td>1.062</td>
<td>1.303</td>
</tr>
<tr>
<td>206/206</td>
<td>0.0550</td>
<td>0.862</td>
<td>0.9146</td>
</tr>
<tr>
<td></td>
<td>0.06205</td>
<td>0.864</td>
<td>0.95997</td>
</tr>
</tbody>
</table>

| Atomic weight | 207.208 (3) | 207.235 (5) | 207.211 (5) | 207.2226 (2) |
| Error         | NS        | NS        | NS        | SD        |

**Annotation**

<table>
<thead>
<tr>
<th>Mass no.</th>
<th>Nuclidic mass</th>
<th>62DOE1</th>
<th>62DOE1</th>
<th>63RIC1</th>
<th>63RIC1</th>
</tr>
</thead>
<tbody>
<tr>
<td>204</td>
<td>203.973037</td>
<td>1.46</td>
<td>1.37</td>
<td>1.425</td>
<td>1.458</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(2)</td>
<td>(2)</td>
<td>(2)</td>
<td>(2)</td>
</tr>
<tr>
<td>206</td>
<td>205.974455</td>
<td>23.42</td>
<td>24.89</td>
<td>24.56</td>
<td>23.48</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(1)</td>
<td>(1)</td>
<td>(1)</td>
<td>(1)</td>
</tr>
<tr>
<td>207</td>
<td>206.975885</td>
<td>22.62</td>
<td>21.45</td>
<td>22.36</td>
<td>22.54</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(2)</td>
<td>(2)</td>
<td>(2)</td>
<td>(2)</td>
</tr>
<tr>
<td>208</td>
<td>207.976641</td>
<td>52.50</td>
<td>52.29</td>
<td>51.65</td>
<td>52.52</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(2)</td>
<td>(2)</td>
<td>(2)</td>
<td>(2)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Isotope ratio</th>
<th>204/206</th>
<th>207/206</th>
<th>206/206</th>
</tr>
</thead>
<tbody>
<tr>
<td>204/206</td>
<td>0.0622</td>
<td>0.8568</td>
<td>2.2421</td>
</tr>
<tr>
<td>207/206</td>
<td>0.0549</td>
<td>0.8621</td>
<td>2.1011</td>
</tr>
<tr>
<td>206/206</td>
<td>0.05802</td>
<td>0.91042</td>
<td>2.10301</td>
</tr>
<tr>
<td></td>
<td>0.06208</td>
<td>0.95997</td>
<td>2.23580</td>
</tr>
</tbody>
</table>

| Atomic weight | 207.2437 (4) | 207.2088 (4) | 207.2044 (2) | 207.2189 (2) |
| Error         | NS        | NS        | SE       | SD        |

**Annotation**

<table>
<thead>
<tr>
<th>Mass no.</th>
<th>Nuclidic mass</th>
<th>66TAT1</th>
<th>66TAT1</th>
<th>68CAT1</th>
<th>69GRA1</th>
</tr>
</thead>
<tbody>
<tr>
<td>204</td>
<td>203.973037</td>
<td>1.346</td>
<td>1.318</td>
<td>1.4245</td>
<td>1.39</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(12)</td>
<td>(16)</td>
<td>(2)</td>
<td>(11)</td>
</tr>
<tr>
<td>206</td>
<td>205.974455</td>
<td>24.795</td>
<td>23.797</td>
<td>24.1447</td>
<td>25.10</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(57)</td>
<td>(36)</td>
<td>(57)</td>
<td>(57)</td>
</tr>
<tr>
<td>207</td>
<td>206.975885</td>
<td>21.103</td>
<td>20.77</td>
<td>22.0827</td>
<td>21.36</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(27)</td>
<td>(15)</td>
<td>(27)</td>
<td>(27)</td>
</tr>
<tr>
<td>208</td>
<td>207.976641</td>
<td>52.756</td>
<td>52.114</td>
<td>52.3481</td>
<td>52.15</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(86)</td>
<td>(86)</td>
<td>(86)</td>
<td>(86)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Isotope ratio</th>
<th>204/206</th>
<th>207/206</th>
<th>206/206</th>
</tr>
</thead>
<tbody>
<tr>
<td>204/206</td>
<td>0.0543</td>
<td>0.8511</td>
<td>1.1277</td>
</tr>
<tr>
<td>207/206</td>
<td>0.0511</td>
<td>0.8952</td>
<td>2,020</td>
</tr>
<tr>
<td>206/206</td>
<td>0.058042</td>
<td>0.91464</td>
<td>1.001</td>
</tr>
<tr>
<td></td>
<td>0.0553</td>
<td>0.8508</td>
<td>0.0774</td>
</tr>
</tbody>
</table>

| Atomic weight | 207.21512 (4) | 207.19950 (4) | 207.2152 (1) | 207.2047 (4) |
| Error         | NS        | NS        | 3XSD      | NS        |
| Annotation    | C, B      |            |           |           |
### ISOTOPIC ABUNDANCES AND ATOMIC WEIGHTS OF THE ELEMENTS

#### Element 206Pb Lead--continued

<table>
<thead>
<tr>
<th>Mass no.</th>
<th>Nuclidic mass</th>
<th>75BAR3</th>
<th>78YAM1</th>
<th>78YAM1</th>
<th>83ICA1</th>
</tr>
</thead>
<tbody>
<tr>
<td>204</td>
<td>203.973037</td>
<td>1.3439 (7)</td>
<td>1.600</td>
<td>1.617</td>
<td>1.4 (1)</td>
</tr>
<tr>
<td>206</td>
<td>205.974455</td>
<td>25.353 (13)</td>
<td>24.771</td>
<td>25.194</td>
<td>24.1 (1)</td>
</tr>
<tr>
<td>208</td>
<td>207.976641</td>
<td>52.228 (26)</td>
<td>52.366</td>
<td>52.026</td>
<td>52.4 (1)</td>
</tr>
<tr>
<td>Isotope ratio 204/206</td>
<td>0.05300</td>
<td>0.0646</td>
<td>0.0642</td>
<td>0.0561</td>
<td></td>
</tr>
<tr>
<td>207/206</td>
<td>0.83127</td>
<td>0.8584</td>
<td>0.8400</td>
<td>0.9170</td>
<td></td>
</tr>
<tr>
<td>206/204</td>
<td>0.00000</td>
<td>2.014</td>
<td>2.005</td>
<td>2.1743</td>
<td></td>
</tr>
<tr>
<td>Atomic weight</td>
<td>207.2043 (3)</td>
<td>207.20383 (4)</td>
<td>207.19560 (4)</td>
<td>207.217 (4)</td>
<td></td>
</tr>
<tr>
<td>Error</td>
<td>2XSD</td>
<td>NS</td>
<td>NS</td>
<td>NS</td>
<td></td>
</tr>
</tbody>
</table>

#### Element 83Bi Bismuth

<table>
<thead>
<tr>
<th>Mass no.</th>
<th>Nuclidic mass</th>
<th>38NIE1</th>
<th>63LE11</th>
<th>83ICA1</th>
</tr>
</thead>
<tbody>
<tr>
<td>209</td>
<td>208.980388</td>
<td>100</td>
<td>100</td>
<td>100</td>
</tr>
<tr>
<td>Isotope ratio</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Atomic weight</td>
<td>208.98039 (3)</td>
<td>208.98039 (3)</td>
<td>208.98039 (3)</td>
<td></td>
</tr>
<tr>
<td>Error</td>
<td>NS</td>
<td>NS</td>
<td>NS</td>
<td></td>
</tr>
</tbody>
</table>

#### Element 232Th Thorium

<table>
<thead>
<tr>
<th>Mass no.</th>
<th>Nuclidic mass</th>
<th>36DEM1</th>
<th>83ICA1</th>
</tr>
</thead>
<tbody>
<tr>
<td>232</td>
<td>231.036697 (2)</td>
<td>100</td>
<td></td>
</tr>
<tr>
<td>Isotope ratio</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Atomic weight</td>
<td>232 (2)</td>
<td>232.036697 (2)</td>
<td></td>
</tr>
<tr>
<td>Error</td>
<td>NS</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

---

### Element $^{92}_{38}$ Uranium

<table>
<thead>
<tr>
<th>Mass no.</th>
<th>Nuclidic mass</th>
<th>39NIE1</th>
<th>46CHA1</th>
<th>46FOX1</th>
<th>46FOX1</th>
</tr>
</thead>
<tbody>
<tr>
<td>234</td>
<td>234.040947400</td>
<td>0.00591 (60)$^C$</td>
<td>0.005040 (30)$^C$</td>
<td>0.00555 (17)$^C$</td>
<td>0.00555 (17)$^C$</td>
</tr>
<tr>
<td>235</td>
<td>235.043925247</td>
<td>0.7148 (71)$^C$</td>
<td>0.7131 (60)$^C$</td>
<td>0.7246 (36)$^C$</td>
<td>0.7193 (16)$^C$</td>
</tr>
<tr>
<td>Isotope ratio 234/238 235/238</td>
<td>0.000060 (6)</td>
<td>0.000051 (3)</td>
<td>0.000056 (2)</td>
<td>0.000056 (2)</td>
<td></td>
</tr>
<tr>
<td>Atomic weight</td>
<td>238.0291 (2)</td>
<td>238.0291 (2)</td>
<td>238.0288 (1)</td>
<td>238.02893 (5)</td>
<td></td>
</tr>
<tr>
<td>Error</td>
<td>P</td>
<td>P</td>
<td>NS</td>
<td>NS</td>
<td></td>
</tr>
</tbody>
</table>

### Annotation

<table>
<thead>
<tr>
<th>Mass no.</th>
<th>Nuclidic mass</th>
<th>56LOU1</th>
<th>56WH11</th>
</tr>
</thead>
<tbody>
<tr>
<td>234</td>
<td>234.040947400</td>
<td>0.0057 (2)$^C$</td>
<td>0.0056 (1)</td>
</tr>
<tr>
<td>235</td>
<td>235.043925247</td>
<td>0.7204 (7)$^C$</td>
<td>0.718 (5)</td>
</tr>
<tr>
<td>238</td>
<td>238.050785782</td>
<td>99.2739 (7)$^C$</td>
<td>99.276 (5)</td>
</tr>
<tr>
<td>Isotope ratio 234/238 235/238</td>
<td>0.000059 (2)</td>
<td>0.000056</td>
<td>0.007232</td>
</tr>
<tr>
<td>Atomic weight</td>
<td>238.02690 (2)</td>
<td>238.0289 (2)</td>
<td></td>
</tr>
<tr>
<td>Error</td>
<td>SD</td>
<td>NS</td>
<td></td>
</tr>
</tbody>
</table>

### Annotation

<table>
<thead>
<tr>
<th>Mass no.</th>
<th>Nuclidic mass</th>
<th>85MII1</th>
<th>85MII1</th>
<th>83ICAI</th>
</tr>
</thead>
<tbody>
<tr>
<td>234</td>
<td>234.040947400</td>
<td>0.005448 (2)</td>
<td>0.00508 (2)</td>
<td>0.0055 (5)</td>
</tr>
<tr>
<td>235</td>
<td>235.043925247</td>
<td>0.7200 (1)</td>
<td>0.7196 (1)</td>
<td>0.7200 (12)</td>
</tr>
<tr>
<td>238</td>
<td>238.050785782</td>
<td>99.2745 (10)</td>
<td>99.2753 (10)</td>
<td>99.2745 (15)</td>
</tr>
<tr>
<td>Isotope ratio 234/238 235/238</td>
<td>0.000055</td>
<td>0.000051</td>
<td>0.0000554</td>
<td></td>
</tr>
<tr>
<td>Atomic weight</td>
<td>238.02879 (3)</td>
<td>238.02890 (3)</td>
<td>238.0289 (1)</td>
<td></td>
</tr>
<tr>
<td>Error</td>
<td>SD</td>
<td>SD</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### Annotation

B B
4. References


34VAU1 A.L. Vaughan, J.H. Williams, and J.T. Tate, Phys. Rev. 46, 977 (1934). Isotopic Abundance Ratio of C, N, O, Ne and He.


37NIE2 A.O. Nier, Phys. Rev. 52, 933 (1937). A Mass Spectrographic Study of the Isotopes of Hg, Xe, Kr, Be, I, As, and Cs.


41MUR1 B.F. Murphy, Phys. Rev. 59, 320 (1941). Relative Abundances of the Oxygen Isotopes.


41WAH2 W. Wahl, Praksa Kemiszt Amfunds Modd. 50, 10 (1941). Eine approximative Bestimmung der Isotopenzusammensetzung von Erbium.


DE BIÈVRE ET AL.


48RAN2 K. Rankama, J. Geol. 56, 190 (1948). A Note on the Original Isotopic Composition of Terrestrial Carbon.


52REU1 C. Reuterward, Arkiv Fysik 4 203 (1952). The isotopic abundance of 46K.

64CHE2  J. Chenouard, Advances in Mass Spectrometry 5, 583 (1964). Determinations of abundances isotopiques de Fe.

64CRI A  W.B. Clarke, and H.G. Tilton, J. Geophys Res. 60, 1671 (1954). The Isotopic Composition of Krypton in Meteorites.


64WET1  G.W. Wetherill, J. Geophys. Res. 69, 4403 (1964). Isotopic Composition and Concentration of Molybdenum in Iron Meteorites.


ISOTOPIC ABUNDANCES AND ATOMIC WEIGHTS OF THE ELEMENTS


4.1. Commission Reports


1963 No changes were made in 1963.

1965 The changes recommended in 1965 are contained in the 1967 Report cited below.


