

# Periodic Table of the Elements

|   | 1<br>I.A   | 2<br>II.A  | 3<br>III.B  | 4<br>IV.B  | 5<br>V.B   | 6<br>VI.B   | 7<br>VII.B  | 8<br>VIII.B   | 9<br>VIII.B   | 10<br>VIII.B   | 11<br>I.B  | 12<br>II.B  | 13<br>III.A  | 14<br>IV.A   | 15<br>V.A  | 16<br>VI.A   | 17<br>VII.A   | 18<br>VIII.A   |  |  |  |   |
|---|--|--|---|--|--|---|---|---|---|--|--|---|--|--|--|--|---|--|--|--|--|---|
| <b>1</b>  | <div style="display: flex; justify-content: space-between; align-items: center;"> <div style="background-color: #e0ffe0; padding: 5px; border: 1px solid black;"> <b>I, I-1</b><br/>                     1,008<br/> <i>0,0899</i><br/> <b>1 H</b> 2,2<br/>                     1766 7 2<br/>                     Hydrogen<br/>                     Hydrogenium                 </div> <div style="text-align: right;"> </div> </div> |  |   |  |  |   |   |   |   |  |  |   |  |  |  |  |   | 4,002<br><i>0,1785</i><br><b>2 He</b> 3,99<br>1895 8 2<br>Helium<br>Helium |  |  |  |   |
|   |  |  |   |  |  |   |   |   |   |  |  |   |  |  |  |  |   | 20,179<br>0,899<br><b>10 Ne</b> 3,67<br>1898 19 3<br>Neon<br>Neon          |  |  |  |   |
| <b>2</b>  | <b>I</b><br>6,941<br>534<br><b>3 Li</b> 0,98<br>1817 12 2<br>Lithium<br>Lithium  | <b>II</b><br>9,012<br>1 820<br><b>4 Be</b> 1,57<br>1798 15 1<br>Beryllium<br>Beryllium   | <div style="display: flex; justify-content: space-between;"> <div style="background-color: #e0ffe0; padding: 5px; border: 1px solid black;"> <b>III, V, VII, I, -III</b><br/>                     30,974<br/>                     1 820<br/> <b>15 P</b> 2,19<br/>                     1669 23 1<br/>                     Phosphorus<br/>                     Phosphorum                 </div> <div style="background-color: #e0ffe0; padding: 5px; border: 1px solid black; font-size: 0.8em;">                     - oxidation states<br/>                     - atomic mass<br/>                     - density at 20°C [kg.m<sup>-3</sup>]<br/>                     - atomic number, chemical symbol, electronegativity [Pauling]<br/>                     - discovery year, total isotopes, stable isotopes<br/>                     - English name<br/>                     - international name                 </div> <div style="background-color: #e0ffe0; padding: 5px; border: 1px solid black; font-size: 0.8em;">                     alkaline metals    alk. earth met.    metals<br/>                     noble gases        inner trans.        trans. metals<br/>                     metalloids         nonmetals         halogens                 </div> </div> |  |  |   |   |   |   |  |  |   |  |  |  |  | 26,982<br>2 700<br><b>13 Al</b> 1,61<br>1825 25 1<br>Aluminium<br>Aluminium | 28,086<br>2 330<br><b>14 Si</b> 1,8<br>1824 25 3<br>Silicon<br>Silicium    | 14,006<br>1,251<br><b>7 N</b> 3,04<br>1772 17 2<br>Nitrogen<br>Nitrogenium | 15,999<br>1,429<br><b>8 O</b> 3,5<br>1774 17 3<br>Oxygen<br>Oxygenium    | 18,998<br>1,696<br><b>9 F</b> 3,98<br>1886 19 1<br>Fluorine<br>Fluorum     | 39,948<br>1,78<br><b>18 Ar</b> 3,3<br>1894 26 2<br>Argon<br>Argon |
|   | <b>I</b><br>22,989<br>971<br><b>11 Na</b> 0,93<br>1807 22 1<br>Sodium<br>Natrium   | <b>II</b><br>24,305<br>1 740<br><b>12 Mg</b> 1,31<br>1808 22 3<br>Magnesium<br>Magnesium |   |  |  |   |   |   |   |  |  |   |  |  |  |  | 44,956<br>3 100<br><b>21 Sc</b> 1,36<br>1879 37 1<br>Scandium<br>Scandium   | 47,867<br>4 500<br><b>22 Ti</b> 1,54<br>1791 28 5<br>Titanium<br>Titanium  | 50,941<br>5 980<br><b>23 V</b> 1,63<br>1830 32 1<br>Vanadium<br>Vanadium   | 51,996<br>7 430<br><b>24 Cr</b> 1,66<br>1797 28 4<br>Chromium<br>Chromum | 54,938<br>7 430<br><b>25 Mn</b> 1,55<br>1774 33 1<br>Manganese<br>Manganum | 55,847<br>7 870<br><b>26 Fe</b> 1,83<br>~ 35 4<br>Iron<br>Ferrum  |
| 85,468<br>1 530<br><b>37 Rb</b> 0,82<br>1861 50 1<br>Rubidium<br>Rubidium | 87,62<br>2 600<br><b>38 Sr</b> 0,95<br>1790 40 4<br>Strontium<br>Strontium   | 88,906<br>4 470<br><b>39 Y</b> 1,22<br>1789 58 1<br>Yttrium<br>Yttrium                   | 91,224<br>6 510<br><b>40 Zr</b> 1,33<br>1789 41 4<br>Zirconium<br>Zirconium   | 92,906<br>8 570<br><b>41 Nb</b> 1,6<br>1801 58 1<br>Niobium<br>Niobium     | 95,94<br>10 200<br><b>42 Mo</b> 2,16<br>1778 40 6<br>Molybdenum<br>Molybdaenum | 97,907<br>11 500<br><b>43 Tc</b> 1,9<br>1937 55 0<br>Technetium<br>Technetium | 101,07<br>12 200<br><b>44 Ru</b> 2,2<br>1844 41 7<br>Ruthenium<br>Ruthenium | 102,906<br>12 400<br><b>45 Rh</b> 2,28<br>1803 45 1<br>Rhodium<br>Rhodium | 106,42<br>12 000<br><b>46 Pd</b> 2,2<br>1803 45 6<br>Palladium<br>Palladium | 107,868<br>10 500<br><b>47 Ag</b> 1,93<br>~ 71 2<br>Silver<br>Argentum | 112,868<br>8 650<br><b>48 Cd</b> 1,69<br>1817 51 6<br>Cadmium<br>Cadmium | 114,818<br>7 310<br><b>49 In</b> 1,78<br>1863 85 1<br>Indium<br>Indium      | 118,71<br>7 300<br><b>50 Sn</b> 1,96<br>~ 63 10<br>Tin<br>Stannum  | 121,75<br>6 690<br><b>51 Sb</b> 2,05<br>~ 62 2<br>Antimony<br>Stibium  | 127,60<br>6 240<br><b>52 Te</b> 2,1<br>1782 56 5<br>Tellurium<br>Tellurium | 126,905<br>4 940<br><b>53 I</b> 2,66<br>1811 51 1<br>Iodine<br>Iodum   | 131,293<br>5,88<br><b>54 Xe</b> 2,6<br>1898 50 9<br>Xenon<br>Xenon          |  |  |  |  |   |
| 132,905<br>1 870<br><b>55 Cs</b> 0,79<br>1860 68 1<br>Caesium<br>Caesium  | 137,327<br>3 510<br><b>56 Ba</b> 0,89<br>1808 49 7<br>Baryum<br>Baryum   | 138,906<br>6 700<br><b>57 La</b> 1,1<br>1839 52 1<br>Lanthanum<br>Lanthanum              | 178,49<br>13 100<br><b>72 Hf</b> 1,3<br>1923 55 5<br>Hafnium<br>Hafnium   | 180,948<br>19 300<br><b>73 Ta</b> 1,5<br>1802 64 1<br>Tantalum<br>Tantalum | 183,84<br>19 300<br><b>74 W</b> 2,36<br>1783 43 5<br>Tungsten<br>Wolframium    | 186,207<br>21 000<br><b>75 Re</b> 1,9<br>1925 55 1<br>Rhenium<br>Rhenium      | 190,23<br>22 660<br><b>76 Os</b> 2,2<br>1804 42 6<br>Osmium<br>Osmium       | 192,217<br>22 650<br><b>77 Ir</b> 2,2<br>1804 68 2<br>Iridium<br>Iridium  | 195,078<br>21 450<br><b>78 Pt</b> 2,28<br>1735 47 5<br>Platinum<br>Platinum | 196,966<br>19 300<br><b>79 Au</b> 2,54<br>~ 70 1<br>Gold<br>Aurum      | 200,59<br>15 300<br><b>80 Hg</b> 2,2<br>~ 56 7<br>Mercury<br>Hydrargyrum | 204,383<br>11 800<br><b>81 Tl</b> 2,04<br>1861 78 2<br>Thallium<br>Thallium | 207,20<br>11 300<br><b>82 Pb</b> 2,33<br>~ 74 4<br>Lead<br>Plumbum | 208,98<br>9 800<br><b>83 Bi</b> 2,02<br>~ 75 0<br>Bismuth<br>Bismuthum | 208,982<br>9 400<br><b>84 Po</b> 2,0<br>1898 58 0<br>Polonium<br>Polonium  | 209,987<br>~<br><b>85 At</b> 2,2<br>1940 53 0<br>Astatine<br>Astatium  | 222,017<br>9,73<br><b>86 Rn</b> 2,0<br>1898 46 0<br>Radon<br>Radon          |  |  |  |  |   |
| 223,01<br>1 873<br><b>87 Fr</b> 0,7<br>1939 43 0<br>Francium<br>Francium  | 226,025<br>5 000<br><b>88 Ra</b> 0,97<br>1898 43 0<br>Radium<br>Radium   | 227,027<br>10 700<br><b>89 Ac</b> 1,1<br>1899 39 0<br>Actinium<br>Actinium               | 261,108<br>23 000?<br><b>104 Rf</b><br>1969 25 0<br>Rutherfordium<br>Rutherfordium  | 262,114<br>~<br><b>105 Db</b><br>1970 21 0<br>Dubnium<br>Dubnium           | 263,118<br>~<br><b>106 Sg</b><br>1974 20 0<br>Seaborgium<br>Seaborgium         | 264,12<br>~<br><b>107 Bh</b><br>1976 18 0<br>Bohrium<br>Bohrium               | 265,13<br>~<br><b>108 Hs</b><br>1984 18 0<br>Hassium<br>Hassium             | [276]<br>~<br><b>109 Mt</b><br>1982 17 0<br>Meitnerium<br>Meitnerium      | [281]<br>~<br><b>110 Ds</b><br>1994 19 0<br>Darmstadtium<br>Darmstadtium    | [280]<br>~<br><b>111 Rg</b><br>1994 12 0<br>Roentgenium<br>Roentgenium | [285]<br>~<br><b>112 Cn</b><br>1996 9 0<br>Copernicium<br>Copernicium    | [286]<br>~<br><b>113 Uut</b><br>2004 5 0<br>Ununtrium<br>Ununtrium          | [289]<br>~<br><b>114 Fl</b><br>1999 5 0<br>Flerovium<br>Flerovium  | [289]<br>~<br><b>115 Uup</b><br>2004 5 0<br>Ununpentium<br>Ununpentium | [293]<br>~<br><b>116 Lv</b><br>1999 4 0<br>Livermorium<br>Livermorium      | [294]<br>~<br><b>117 Uus</b><br>2004 2 0<br>Ununseptium<br>Ununseptium | [294]<br>~<br><b>118 Uuo</b><br>1999 1 0<br>Ununoctium<br>Ununoctium        |  |  |  |  |   |

|  |  |  |  |   |  |  |   |   |  |   |   |  |  |
|--|--|--|--|---|--|--|---|---|--|---|---|--|--|
| 140,116<br>6 670<br><b>58 Ce</b> 1,12<br>1803 52 4<br>Cerium<br>Cerium   | 140,907<br>6 770<br><b>59 Pr</b> 1,13<br>1885 54 1<br>Praseodymium<br>Praseodymium | 144,242<br>7 000<br><b>60 Nd</b> 1,14<br>1925 51 5<br>Neodymium<br>Neodymium | 144,913<br>6 475<br><b>61 Pm</b> 1,13<br>1945 57 0<br>Promethium<br>Promethium | 150,36<br>7 536<br><b>62 Sm</b> 1,17<br>1879 50 5<br>Samarium<br>Samarium     | 151,964<br>5 260<br><b>63 Eu</b> 1,2<br>1901 51 2<br>Europium<br>Europium    | 157,25<br>7 890<br><b>64 Gd</b> 1,2<br>1880 46 6<br>Gadolinium<br>Gadolinium | 158,925<br>8 270<br><b>65 Tb</b> 1,2<br>1843 59 1<br>Terbium<br>Terbium     | 162,5<br>8 540<br><b>66 Dy</b> 1,22<br>1886 47 7<br>Dysprosium<br>Dysprosium    | 164,93<br>8 780<br><b>67 Ho</b> 1,23<br>1878 64 1<br>Holmium<br>Holmium          | 167,259<br>9 050<br><b>68 Er</b> 1,24<br>1843 45 6<br>Erbium<br>Erbium    | 168,934<br>9 330<br><b>69 Tm</b> 1,25<br>1879 58 1<br>Thulium<br>Thulium          | 173,054<br>6 980<br><b>70 Yb</b> 1,25<br>1878 46 7<br>Ytterbium<br>Ytterbium | 174,967<br>9 840<br><b>71 Lu</b> 1,27<br>1907 71 1<br>Lutetium<br>Lutetium   |
| 232,038<br>11 720<br><b>90 Th</b> 1,3<br>1828 33 0<br>Thorium<br>Thorium | 231,036<br>15 370<br><b>91 Pa</b> 1,5<br>1917 32 0<br>Protaktinium<br>Protaktinium | 238,029<br>18 970<br><b>92 U</b> 1,38<br>1789 32 0<br>Uranium<br>Uranium     | 237,048<br>19 740<br><b>93 Np</b> 1,36<br>1940 30 0<br>Neptunium<br>Neptunium  | 244,064<br>13 670<br><b>94 Pu</b> 1,28<br>1940 30 0<br>Plutonium<br>Plutonium | 243,061<br>13 670<br><b>95 Am</b> 1,3<br>1945 26 0<br>Americium<br>Americium | 247,07<br>13 510<br><b>96 Cm</b> 1,3<br>1944 27 0<br>Curium<br>Curium        | 247,07<br>14 780<br><b>97 Bk</b> 1,3<br>1949 36 0<br>Berkelium<br>Berkelium | 251,07<br>15 100<br><b>98 Cf</b> 1,3<br>1950 23 0<br>Californium<br>Californium | 252,083<br>15 370<br><b>99 Es</b> 1,3<br>1952 30 0<br>Einsteinium<br>Einsteinium | 257,095<br>18 970<br><b>100 Fm</b> 1,3<br>1953 25 0<br>Fermium<br>Fermium | 258,098<br>20 480<br><b>101 Md</b> 1,3<br>1955 31 0<br>Mendelevium<br>Mendelevium | 259,101<br>19 740<br><b>102 No</b> 1,3<br>1957 23 0<br>Nobelium<br>Nobelium  | 260<br>13 670<br><b>103 Lr</b> 1,29<br>1961 23 0<br>Lawrencium<br>Lawrencium |