|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | 1 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | 18 (8) |
| 1 | 1  H  Hydrogen  1.008  1 −1  1s¹ | 2 |  | 1  H  Hydrogen  1.008  1 −1  1s¹ | | Atomic number  Symbol  Name  Atomic weight (amu, g/mol)  Oxidation states (with rare states in brackets)  Electron configuration (anomalous configurations denoted with ⚠) | | | | | |  | 13 (3) | 14 (4) | 15 (5) | 16 (6) | 17 (7)  (halogens) | 2  He  Helium  4.002 602  0  1s² |
| 2 | 3  Li  Lithium  6.94  1  [He]2s¹ | 4  Be  Beryllium  9.012 183  2 (−1)  [He]2s² |  |  | 5  B  Boron  10.81  3 (2 1 −1 −5)  [He]2s² 2p¹ | 6  C  Carbon  12.011  4 3 2 1 −1 −2 −3 −4  [He]2s² 2p² | 7  N  Nitrogen  14.007  5 3 −3 (4 2 1 −1 −2)  [He] 2s² 2p³ | 8  O  Oxygen  15.999  −2 (2 1 −1)  [He]2s² 2p⁴ | 9  F  Fluorine  18.998 403  −1  [He]2s² 2p⁵ | 10  Ne  Neon  20.1797  0  [He]2s² 2p⁶ |
| 3 | 11  Na  Sodium  22.989 769  1 (−1)  [Ne]3s¹ | 12  Mg  Magnesium  24.305  2 (−1)  [Ne]3s² | ■  Alkali metals  3 | ■  Alkaline earth metals  4 | ■  Lanthanides  5 | ■  Actinides  6 | ■  Transition metals  7 | ■  Post-transition metals  8 | ■  Metalloids  9 | ■  Reactive nonmetals  10 | ■  Noble gases  11 | ■  Chemical properties unknown  12 | 13  Al  Aluminium  26.981 538  3 (2 1 −1 −2)  [Ne]3s² 3p¹ | 14  Si  Silicon  28.085  4 −4 (3 2 1 −1 −2 −3)  [Ne]3s² 3p² | 15  P  Phosphorus  30.973 762  5 3 −3 (4 2 1 −1 −2)  [Ne]3s² 3p³ | 16  S  Sulfur  32.06  6 4 2 −2 (5 3 1 −1)  [Ne]3s² 3p⁴ | 17  Cl  Chlorine  35.45  7 5 3 1 −1 (6 4 2)  [Ne]3s² 3p⁵ | 18  Ar  Argon  39.95  0  [Ne]3s² 3p⁶ |
| 4 | 19  K  Potassium  39.0983  1 (−1)  [Ar]4s¹ | 20  Ca  Calcium  40.078  2 (−1)  [Ar]4s² | 21  Sc  Scandium  44.955 907  3 (2 1)  [Ar]4s² 3d¹ | 22  Ti  Titanium  47.867  4 (3 2 1 −1 −2)  [Ar]4s² 3d² | 23  V  Vanadium  50.9415  5 (4 3 2 1 −1 −3)  [Ar]4s² 3d³ | 24  Cr  Chromium  51.9961  6 3 (5 4 2 1 −1 −2 −4)  ⚠[Ar]3d⁵ 4s¹ | 25  Mn  Manganese  54.938 043  7 4 2 (6 5 3 1 −1 −2 −3)  [Ar]4s² 3d⁵ | 26  Fe  Iron  55.845  6 3 2 (5 4 1 −1 −2 −4)  [Ar]4s² 3d⁶ | 27  Co  Cobalt  58.933 194  3 2 (5 4 1 −1 −3)  [Ar]4s² 3d⁷ | 28  Ni  Nickel  58.6934  2 (4 3 1 −1 −2)  [Ar]4s² 3d⁸ | 29  Cu  Copper  63.546  2 (4 3 1 −2)  ⚠[Ar]4s¹ 3d¹⁰ | 30  Zn  Zinc  65.38  2 (1 −2)  [Ar]4s² 3d¹⁰ | 31  Ga  Gallium  69.723  3 (2 1 −1 −2 −4 −5)  [Ar]4s² 3d¹⁰ 4p¹ | 32  Ge  Germanium  72.630  4 2 −4 (3 1 −1 −2 −3)  [Ar]4s² 3d¹⁰ 4p² | 33  As  Arsenic  74.921 595  5 3 −3 (4 2 1 −1 −2)  [Ar]4s² 3d¹⁰ 4p³ | 34  Se  Selenium  78.971  6 4 2 −2 (5 3 1 −1)  [Ar]4s² 3d¹⁰ 4p⁴ | 35  Br  Bromine  79.904  7 5 3 1 −1 (4)  [Ar]4s² 3d¹⁰ 4p⁵ | 36  Kr  Krypton  83.798  0 (2)  [Ar]4s² 3d¹⁰ 4p⁶ |
| 5 | 37  Rb  Rubidium  85.4678  1 (−1)  [Kr]5s¹ | 38  Sr  Strontium  87.62  2 (−1)  [Kr]5s² | 39  Y  Yttrium  88.905 838  3 (2 1)  [Kr]5s² 4d¹ | 40  Zr  Zirconium  91.224  4 (3 2 1 −2)  [Kr]5s² 4d² | 41  Nb  Niobium  92.906 37  5 (4 3 2 1 −1 −3)  ⚠[Kr]5s¹ 4d⁴ | 42  Mo  Molybdenum  95.95  6 4 (5 3 2 1 −1 −2 −4)  ⚠[Kr]5s¹ 4d⁵ | 43  Tc  Technetium  [97]  7 4 (6 5 3 2 1 −1 −3)  [Kr]5s² 4d⁵ | 44  Ru  Ruthenium  101.07  4 3 2 (8 7 6 5 1 −2 −4)  ⚠[Kr]5s¹ 4d⁷ | 45  Rh  Rhodium  102.905 49  3 (5 4 2 1 −1 −3)  ⚠[Kr]5s¹ 4d⁸ | 46  Pd  Palladium  106.42  4 2 (6 5 3 1)  ⚠[Kr]4d¹⁰ | 47  Ag  Silver  107.8682  1 (4 3 2 −1 −2)  ⚠[Kr]5s¹ 4d¹⁰ | 48  Cd  Cadmium  112.414  2 (1 −2)  [Kr]5s² 4d¹⁰ | 49  In  Indium  114.818  3 (2 1 −1 −2 −5)  [Kr]5s² 4d¹⁰ 5p¹ | 50  Sn  Tin  118.710  4 2 −4 (3 1 −1 −2 −3)  [Kr]5s² 4d¹⁰ 5p² | 51  Sb  Antimony  121.760  5 3 −3 (4 2 1 −1 −2)  [Kr]5s² 4d¹⁰ 5p³ | 52  Te  Tellurium  127.60  6 4 2 −2 (5 3 1 −1)  [Kr]5s² 4d¹⁰ 5p⁴ | 53  I  Iodine  126.904 47  7 5 3 1 −1 (6 4)  [Kr]5s² 4d¹⁰ 5p⁵ | 54  Xe  Xenon  131.293  0 (8 6 4 2)  [Kr]5s² 4d¹⁰ 5p⁶ |
| 6 | 55  Cs  Caesium  132.905 452  1 (−1)  [Xe]6s¹ | 56  Ba  Barium  137.327  2 (−1)  [Xe]6s² | 6\* | 72  Hf  Hafnium  178.486  4 (3 2 1 −2)  [Xe]6s² 4f¹⁴ 5d² | 73  Ta  Tantalum  180.947 88  5 (4 3 2 1 −1 −3)  [Xe]6s² 4f¹⁴ 5d³ | 74  W  Tungsten  183.84  6 4 (5 3 2 1 −1 −2 −4)  [Xe]6s² 4f¹⁴ 5d⁴ | 75  Re  Rhenium  186.207  4 (7 6 5 3 2 1 −1 −3)  [Xe]6s² 4f¹⁴ 5d⁵ | 76  Os  Osmium  190.23  4 (8 7 6 5 3 2 1 −1 −2 −4)  [Xe]6s² 4f¹⁴ 5d⁶ | 77  Ir  Iridium  192.217  4 3 (9 8 7 6 5 2 1 −1 −3)  [Xe]6s² 4f¹⁴ 5d⁷ | 78  Pt  Platinum  195.084  4 2 (6 5 3 1 −1 −2 −3)  ⚠[Xe]6s¹ 4f¹⁴ 5d⁹ | 79  Au  Gold  196.966 570  3 (5 2 1 −1 −2 −3)  ⚠[Xe]6s¹ 4f¹⁴ 5d¹⁰ | 80  Hg  Mercury  200.592  2 1 (−2)  [Xe]6s² 4f¹⁴ 5d¹⁰ | 81  Tl  Thallium  204.38  3 1 (2 −1 −2 −5)  [Xe]6s² 4f¹⁴ 5d¹⁰ 6p¹ | 82  Pb  Lead  207.2  4 2 (3 1 −1 −2 −4)  [Xe]6s² 4f¹⁴ 5d¹⁰ 6p² | 83  Bi  Bismuth  208.980 40  3 (4 3 2 1 −1 −2 −3)  [Xe]6s² 4f¹⁴ 5d¹⁰ 6p³ | 84  Po  Polonium  [209]  4 2 −2 (6 5)  [Xe]6s² 4f¹⁴ 5d¹⁰ 6p⁴ | 85  At  Astatine  [210]  1 −1 (7 5 3)  [Xe]6s² 4f¹⁴ 5d¹⁰ 6p⁵ | 86  Rn  Radon  [222]  0 (6 2)  [Xe]6s² 4f¹⁴ 5d¹⁰ 6p⁶ |
| 7 | 87  Fr  Francium  [223]  1  [Rn]7s¹ | 88  Ra  Radium  [226]  2  [Rn]7s² | 7\* | 104  Rf  Rutherfordium  [267]  4  [Rn]7s² 5f¹⁴ 6d² | 105  Db  Dubnium  [270]  5  [Rn]7s² 5f¹⁴ 6d³ | 106  Sg  Seaborgium  [269]  6  [Rn]7s² 5f¹⁴ 6d⁴ | 107  Bh  Bohrium  [270]  7  [Rn]7s² 5f¹⁴ 6d⁵ | 108  Hs  Hassium  [270]  8  [Rn]7s² 5f¹⁴ 6d⁶ | 109  Mt  Meitnerium  [278] | 110  Ds  Darmstadtium  [281] | 111  Rg  Roentgenium  [281] | 112  Cn  Copernicium  [285]  2 | 113  Nh  Nihonium  [286] | 114  Fl  Flerovium  [289] | 115  Mc  Moscovium  [289] | 116  Lv  Livermorium  [293] | 117  Ts  Tennessine  [293] | 118  Og  Oganesson  [294] |
| Flinders Academic Science Club  **direct.me/flasc** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|  |  | 6\* | 57  La  Lanthanum  138.905 47  3 (2 1)  ⚠[Xe]6s² 5d¹ | 58  Ce  Cerium  140.116  4 3 (2)  ⚠[Xe]6s² 4f¹ 5d¹ | 59  Pr  Praseodymium  140.907 66  3 (4 2)  [Xe]6s² 4f³ | 60  Nd  Neodymium  144.242  3 (4 2)  [Xe]6s² 4f⁴ | 61  Pm  Promethium  [145]  3 (2)  [Xe]6s² 4f⁵ | 62  Sm  Samarium  150.36  3 (2)  [Xe]6s² 4f⁶ | 63  Eu  Europium  151.964  3 2  [Xe]6s² 4f⁷ | 64  Gd  Gadolinium  157.25  3 (2 1)  ⚠[Xe]6s² 4f⁷ 5d¹ | 65  Tb  Terbium  158.925 354  3 (4 2 1)  [Xe]6s² 4f⁹ | 66  Dy  Dysprosium  162.500  3 (4 2)  [Xe]6s² 4f¹⁰ | 67  Ho  Holmium  164.930 329  3 (2)  [Xe]6s² 4f¹¹ | 68  Er  Erbium  167.259  3 (2)  [Xe]6s² 4f¹² | 69  Tm  Thulium  168.934 219  3 (2)  [Xe]6s² 4f¹³ | 70  Yb  Ytterbium  173.05  3 (2)  [Xe]6s² 4f¹⁴ | 71  Lu  Lutetium  174.9668  3 (2)  [Xe]6s² 4f¹⁴ 5d¹ |  |
|  |  | 7\* | 89  Ac  Actinium  [227]  3 (2)  ⚠[Rn]7s² 6d¹ | 90  Th  Thorium  232.0377  4 (3 2 1)  ⚠[Rn]7s² 6d² | 91  Pa  Protactinium  231.035 88  5 (4 3 2)  ⚠[Rn]7s² 5f² 6d¹ | 92  U  Uranium  238.028 91  6 4 (5 3 2 1)  ⚠[Rn]7s² 5f³ 6d¹ | 93  Np  Neptunium  [237]  5 (7 6 4 3 2)  ⚠[Rn]7s² 5f⁴ 6d¹ | 94  Pu  Plutonium  [244]  4 (8 7 6 5 3 2 1)  [Rn]7s² 5f⁶ | 95  Am  Americium  [243]  3 (8 7 6 5 4 2)  [Rn]7s² 5f⁷ | 96  Cm  Curium  [247]  3 (6 4 2)  ⚠[Rn]7s² 5f⁷ 6d¹ | 97  Bk  Berkelium  [247]  3 (4 2)  [Rn]7s² 5f⁹ | 98  Cf  Californium  [251]  3 (4 2)  [Rn]7s² 5f¹⁰ | 99  Es  Einsteinium  [252]  3 (4 2)  [Rn]7s² 5f¹¹ | 100  Fm  Fermium  [257]  3 (2)  [Rn]7s² 5f¹² | 101  Md  Mendelevium  [258]  3 (2)  [Rn]7s² 5f¹³ | 102  No  Nobelium  [259]  2 (3)  [Rn]7s² 5f¹⁴ | 103  Lr  Lawrencium  [262]  3  ⚠[Rn]7s² 5f¹⁴ 7p¹ |  |

Table compiled by FLASC, 2022. Atomic weights sourced from IUPAC 2016. Electron configurations sourced from PubChem n.d. Oxidation states sourced from CompoundChem 2015. All elements have an additional implied oxidation state of 0. IUPAC classifies Zinc, Cadmium, Mercury, and Copernicium as post-transition metals; other sources may disagree and classify them as transition metals. The list of metalloids may vary – Selenium, Polonium, Astatine, Carbon, and Aluminium may be included or excluded depending on the source. Some electron configurations may vary in other sources: research literature (as opposed to chemistry textbooks) uses [Ar]4s¹ 3d⁹ for Nickel, and older sources use [Rn]7s² 5f¹⁴ 6d¹ for Lawrencium.

**Sources:**

Initial data, and electron configurations: <https://pubchem.ncbi.nlm.nih.gov/rest/pug/periodictable/XML/?response_type=display> (archive: <https://web.archive.org/web/20220523153627/https://pubchem.ncbi.nlm.nih.gov/rest/pug/periodictable/XML/?response_type=display>)

Corrected atomic masses: <https://iupac.qmul.ac.uk/AtWt/> (archive: <https://web.archive.org/web/20220523153640/https://iupac.qmul.ac.uk/AtWt/>)

More detailed oxidation states: <https://www.compoundchem.com/2015/11/17/oxidation-states/> (archive: <https://web.archive.org/web/20220523153614/https://www.compoundchem.com/2015/11/17/oxidation-states/>) i.e. <https://i0.wp.com/www.compoundchem.com/wp-content/uploads/2015/11/The-Periodic-Table-Of-Oxidation-States-2016.png?ssl=1> (archive: <https://web.archive.org/web/20220523153619/https://i0.wp.com/www.compoundchem.com/wp-content/uploads/2015/11/The-Periodic-Table-Of-Oxidation-States-2016.png?ssl=1>)

Electron configuration exceptions: <https://www.quora.com/What-are-exceptional-cases-in-electron-configuration> and <https://en.wikipedia.org/wiki/Electron_configuration> (archive: <https://en.wikipedia.org/w/index.php?title=Electron_configuration&oldid=1084879392>).

Nickel electron configuration: <https://en.wikipedia.org/wiki/Nickel#Electron_configuration_dispute> (archive: <https://en.wikipedia.org/w/index.php?title=Nickel&oldid=1088788937>)

Lawrencium electron configuration: <https://en.wikipedia.org/wiki/Lawrencium> (archive: <https://en.wikipedia.org/w/index.php?title=Lawrencium&oldid=1083399220>)

There were also several manual changes from these sources (mostly for the synthetic elements at the end) based on quick google searches, Wikipedia pages for individual elements, etc.