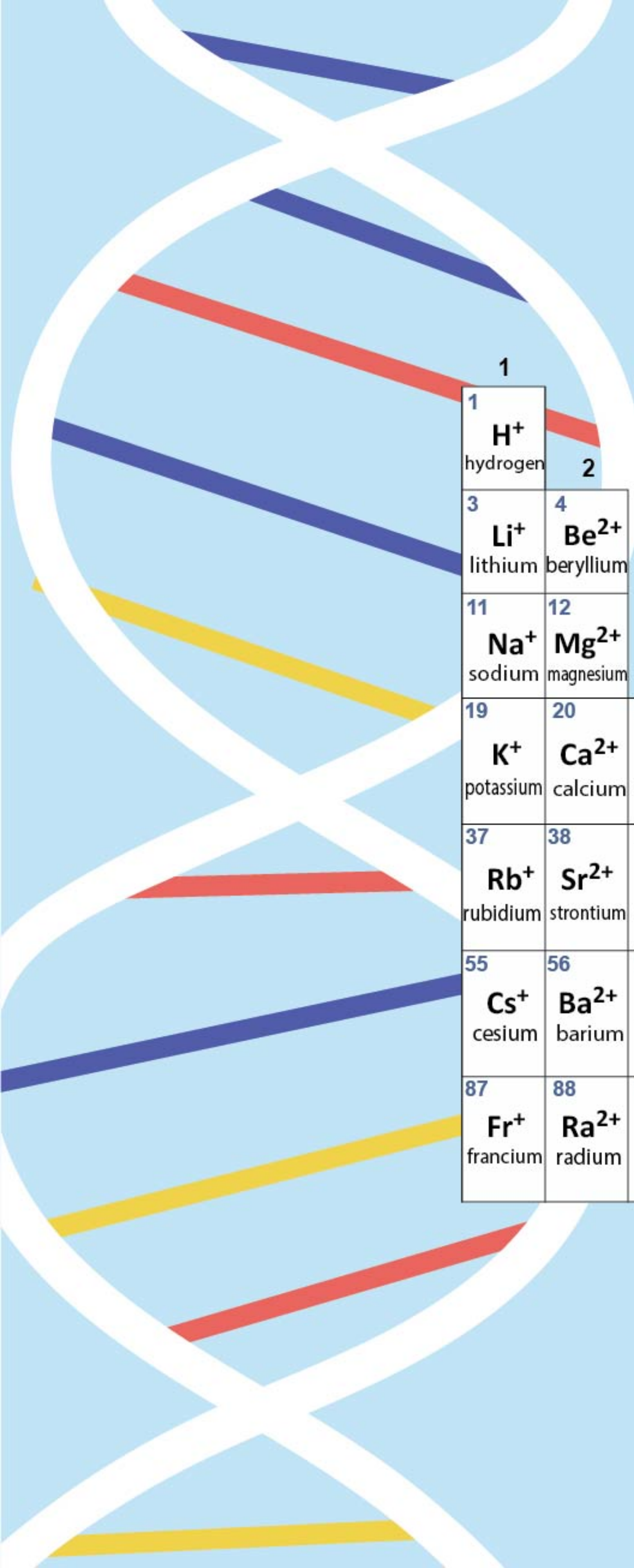




| TABLE OF POLYATOMIC IONS |                                                |                        |                                             |                          |                                             |
|--------------------------|------------------------------------------------|------------------------|---------------------------------------------|--------------------------|---------------------------------------------|
| acetate                  | CH <sub>3</sub> COO <sup>-</sup>               | dihydrogen phosphate   | H <sub>2</sub> PO <sub>4</sub> <sup>-</sup> | oxalate                  | C <sub>2</sub> O <sub>4</sub> <sup>2-</sup> |
| arsenate                 | AsO <sub>4</sub> <sup>3-</sup>                 | hydrogen carbonate     | HCO <sub>3</sub> <sup>-</sup>               | perchlorate              | ClO <sub>4</sub> <sup>-</sup>               |
| arsenite                 | AsO <sub>3</sub> <sup>3-</sup>                 | hydrogen oxalate       | HC <sub>2</sub> O <sub>4</sub> <sup>-</sup> | periodate                | IO <sub>4</sub> <sup>-</sup>                |
| benzoate                 | C <sub>6</sub> H <sub>5</sub> COO <sup>-</sup> | hydrogen sulfate       | HSO <sub>4</sub> <sup>-</sup>               | permanganate             | MnO <sub>4</sub> <sup>-</sup>               |
| borate                   | BO <sub>3</sub> <sup>3-</sup>                  | hydrogen sulfide       | HS <sup>-</sup>                             | peroxide                 | O <sub>2</sub> <sup>2-</sup>                |
| bromate                  | BrO <sub>3</sub> <sup>-</sup>                  | hydrogen sulfite       | HSO <sub>3</sub> <sup>-</sup>               | phosphate                | PO <sub>4</sub> <sup>3-</sup>               |
| carbonate                | CO <sub>3</sub> <sup>2-</sup>                  | hydroxide              | OH <sup>-</sup>                             | pyrophosphate            | P <sub>2</sub> O <sub>7</sub> <sup>4-</sup> |
| chlorate                 | ClO <sub>3</sub> <sup>-</sup>                  | hypochlorite           | ClO <sup>-</sup>                            | sulfate                  | SO <sub>4</sub> <sup>2-</sup>               |
| chlorite                 | ClO <sub>2</sub> <sup>-</sup>                  | iodate                 | IO <sub>3</sub> <sup>-</sup>                | sulfite                  | SO <sub>3</sub> <sup>2-</sup>               |
| chromate                 | CrO <sub>4</sub> <sup>2-</sup>                 | monohydrogen phosphate | HPO <sub>4</sub> <sup>2-</sup>              | thiocyanate              | SCN <sup>-</sup>                            |
| cyanate                  | CNO <sup>-</sup>                               | nitrate                | NO <sub>3</sub> <sup>-</sup>                | thiosulfate              | S <sub>2</sub> O <sub>3</sub> <sup>2-</sup> |
| cyanide                  | CN <sup>-</sup>                                | nitrite                | NO <sub>2</sub> <sup>-</sup>                | POSITIVE POLYATOMIC IONS |                                             |
| dichromate               | Cr <sub>2</sub> O <sub>7</sub> <sup>2-</sup>   | orthosilicate          | SiO <sub>4</sub> <sup>4-</sup>              | ammonium                 | NH <sub>4</sub> <sup>+</sup>                |
|                          |                                                |                        |                                             | hydronium                | H <sub>3</sub> O <sup>+</sup>               |

# PERIODIC TABLE

KEY

atomic number → 26  
ion charge → Fe<sup>3+</sup>  
symbol → Fe  
ion name (IUPAC) → iron (III)  
ion name (common) → iron (II)

|                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                               |                  |                  |                  |                  |                 |         |    |  |    |  |
|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|-------------------------------|------------------|------------------|------------------|------------------|-----------------|---------|----|--|----|--|
| 1                |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                               | 17               |                  | 18               |                  |                 |         |    |  |    |  |
| 1                |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                               | 1                |                  | 2                |                  |                 |         |    |  |    |  |
| H <sup>+</sup>   |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                               | H <sup>-</sup>   |                  | He               |                  |                 |         |    |  |    |  |
| hydrogen         |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                               | hydride          |                  | helium           |                  |                 |         |    |  |    |  |
| 2                |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                               |                  |                  |                  |                  |                 |         |    |  |    |  |
| 3                | 4                |                  |                  |                  |                  |                  |                  |                  |                  |                  |                               | 5                |                  | 6                |                  |                 |         |    |  |    |  |
| Li <sup>+</sup>  | Be <sup>2+</sup> |                  |                  |                  |                  |                  |                  |                  |                  |                  |                               | B                |                  | C                |                  |                 |         |    |  |    |  |
| lithium          | beryllium        |                  |                  |                  |                  |                  |                  |                  |                  |                  |                               | boron            |                  | carbon           |                  |                 |         |    |  |    |  |
| 11               | 12               |                  |                  |                  |                  |                  |                  |                  |                  |                  |                               | 13               |                  | 14               |                  |                 |         |    |  |    |  |
| Na <sup>+</sup>  | Mg <sup>2+</sup> |                  |                  |                  |                  |                  |                  |                  |                  |                  |                               | Al <sup>3+</sup> |                  | Si               |                  |                 |         |    |  |    |  |
| sodium           | magnesium        |                  |                  |                  |                  |                  |                  |                  |                  |                  |                               | aluminum         |                  | silicon          |                  |                 |         |    |  |    |  |
|                  |                  | 3                |                  | 4                |                  | 5                |                  | 6                |                  | 7                |                               | 8                |                  | 9                |                  | 10              |         | 11 |  | 12 |  |
| 19               | 20               | 21               | 22               | 23               | 24               | 25               | 26               | 27               | 28               | 29               | 30                            | 31               | 32               | 33               | 34               | 35              | 36      |    |  |    |  |
| K <sup>+</sup>   | Ca <sup>2+</sup> | Sc <sup>3+</sup> | Ti <sup>4+</sup> | V <sup>3+</sup>  | Cr <sup>3+</sup> | Mn <sup>2+</sup> | Fe <sup>3+</sup> | Co <sup>2+</sup> | Ni <sup>2+</sup> | Cu <sup>2+</sup> | Zn <sup>2+</sup>              | Ga <sup>3+</sup> | Ge <sup>4+</sup> | As <sup>3-</sup> | Se <sup>2-</sup> | Br <sup>-</sup> | Kr      |    |  |    |  |
| potassium        | calcium          | scandium         | titanium (IV)    | vanadium(III)    | chromium (III)   | manganese(II)    | iron (III)       | cobalt (II)      | nickel (II)      | copper (II)      | zinc                          | gallium          | germanium        | arsenide         | selenide         | bromide         | krypton |    |  |    |  |
|                  |                  |                  | Ti <sup>3+</sup> | V <sup>5+</sup>  | Cr <sup>2+</sup> | Mn <sup>4+</sup> | Fe <sup>2+</sup> | Co <sup>3+</sup> | Ni <sup>3+</sup> | Cu <sup>+</sup>  |                               |                  |                  |                  |                  |                 |         |    |  |    |  |
|                  |                  |                  | titanium (III)   | vanadium (V)     | chromium (II)    | manganese(IV)    | iron (II)        | cobalt (III)     | nickel (III)     | copper (I)       |                               |                  |                  |                  |                  |                 |         |    |  |    |  |
| 37               | 38               | 39               | 40               | 41               | 42               | 43               | 44               | 45               | 46               | 47               | 48                            | 49               | 50               | 51               | 52               | 53              | 54      |    |  |    |  |
| Rb <sup>+</sup>  | Sr <sup>2+</sup> | Y <sup>3+</sup>  | Zr <sup>4+</sup> | Nb <sup>5+</sup> | Mo <sup>6+</sup> | Tc <sup>7+</sup> | Ru <sup>3+</sup> | Rh <sup>3+</sup> | Pd <sup>2+</sup> | Ag <sup>+</sup>  | Cd <sup>2+</sup>              | In <sup>3+</sup> | Sn <sup>4+</sup> | Sb <sup>3+</sup> | Te <sup>2-</sup> | I <sup>-</sup>  | Xe      |    |  |    |  |
| rubidium         | strontium        | yttrium          | zirconium        | niobium (V)      | molybdenum       | technetium       | ruthenium(III)   | rhodium          | paladium(II)     | silver           | cadmium                       | indium           | tin (IV)         | antimony(III)    | telluride        | iodide          | xenon   |    |  |    |  |
|                  |                  |                  |                  | Nb <sup>3+</sup> |                  |                  | Ru <sup>4+</sup> |                  | Pd <sup>4+</sup> |                  |                               |                  | Sn <sup>2+</sup> | Sb <sup>5+</sup> |                  |                 |         |    |  |    |  |
|                  |                  |                  |                  | niobium(III)     |                  |                  | ruthenium(IV)    |                  | paladium(IV)     |                  |                               |                  | tin (II)         | antimony(V)      |                  |                 |         |    |  |    |  |
| 55               | 56               | 57               | 72               | 73               | 74               | 75               | 76               | 77               | 78               | 79               | 80                            | 81               | 82               | 83               | 84               | 85              | 86      |    |  |    |  |
| Cs <sup>+</sup>  | Ba <sup>2+</sup> | La <sup>3+</sup> | Hf <sup>4+</sup> | Ta <sup>5+</sup> | W <sup>6+</sup>  | Re <sup>7+</sup> | Os <sup>4+</sup> | Ir <sup>4+</sup> | Pt <sup>4+</sup> | Au <sup>3+</sup> | Hg <sup>2+</sup>              | Tl <sup>+</sup>  | Pb <sup>2+</sup> | Bi <sup>3+</sup> | Po <sup>2+</sup> | At <sup>-</sup> | Rn      |    |  |    |  |
| cesium           | barium           | lanthanum        | hafnium          | tantalum         | tungsten         | rhenium          | osmium           | iridium          | platinum(IV)     | gold (III)       | mercury (II)                  | thallium (I)     | lead (II)        | bismuth(III)     | polonium(II)     | astatide        | radon   |    |  |    |  |
|                  |                  |                  |                  |                  |                  |                  |                  |                  | Pt <sup>2+</sup> | Au <sup>+</sup>  | Hg <sub>2</sub> <sup>2+</sup> | Tl <sup>3+</sup> | Pb <sup>4+</sup> | Bi <sup>5+</sup> | Po <sup>4+</sup> |                 |         |    |  |    |  |
|                  |                  |                  |                  |                  |                  |                  |                  |                  | platinum(II)     | gold (I)         | mercury (I)                   | thallium(III)    | lead (IV)        | bismuth(V)       | polonium(IV)     |                 |         |    |  |    |  |
| 87               | 88               | 89               |                  |                  |                  |                  |                  |                  |                  |                  |                               |                  |                  |                  |                  |                 |         |    |  |    |  |
| Fr <sup>+</sup>  | Ra <sup>2+</sup> | Ac <sup>3+</sup> |                  |                  |                  |                  |                  |                  |                  |                  |                               |                  |                  |                  |                  |                 |         |    |  |    |  |
| francium         | radium           | actinium         |                  |                  |                  |                  |                  |                  |                  |                  |                               |                  |                  |                  |                  |                 |         |    |  |    |  |
|                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                               |                  |                  |                  |                  |                 |         |    |  |    |  |
| 58               | 59               | 60               | 61               | 62               | 63               | 64               | 65               | 66               | 67               | 68               | 69                            | 70               | 71               |                  |                  |                 |         |    |  |    |  |
| Ce <sup>3+</sup> | Pr <sup>3+</sup> | Nd <sup>3+</sup> | Pm <sup>3+</sup> | Sm <sup>3+</sup> | Eu <sup>3+</sup> | Gd <sup>3+</sup> | Tb <sup>3+</sup> | Dy <sup>3+</sup> | Ho <sup>3+</sup> | Er <sup>3+</sup> | Tm <sup>3+</sup>              | Yb <sup>3+</sup> | Lu <sup>3+</sup> |                  |                  |                 |         |    |  |    |  |
| cerium           | praseodymium     | neodymium        | promethium       | samarium(III)    | europium (III)   | gadolinium       | terbium          | dysprosium       | holmium          | erbium           | thulium                       | ytterbium(III)   | lutetium         |                  |                  |                 |         |    |  |    |  |
|                  |                  |                  |                  | Sm <sup>2+</sup> | Eu <sup>2+</sup> |                  |                  |                  |                  |                  |                               | Yb <sup>2+</sup> |                  |                  |                  |                 |         |    |  |    |  |
|                  |                  |                  |                  | samarium(II)     | europium (II)    |                  |                  |                  |                  |                  |                               | ytterbium(II)    |                  |                  |                  |                 |         |    |  |    |  |
| 90               | 91               | 92               | 93               | 94               | 95               | 96               | 97               | 98               | 99               | 100              | 101                           | 102              | 103              |                  |                  |                 |         |    |  |    |  |
| Th <sup>4+</sup> | Pa <sup>5+</sup> | U <sup>6+</sup>  | Np <sup>5+</sup> | Pu <sup>4+</sup> | Am <sup>3+</sup> | Cm <sup>3+</sup> | Bk <sup>3+</sup> | Cf <sup>3+</sup> | Es <sup>3+</sup> | Fm <sup>3+</sup> | Md <sup>2+</sup>              | No <sup>2+</sup> | Lr <sup>3+</sup> |                  |                  |                 |         |    |  |    |  |
| thorium          | protactinium(V)  | uranium (VI)     | neptunium        | plutonium(IV)    | americium(III)   | curium           | berkelium(III)   | californium      | einsteinium      | fermium          | mendelevium (II)              | nobelium(II)     | lawrencium       |                  |                  |                 |         |    |  |    |  |
|                  | Pa <sup>4+</sup> | U <sup>4+</sup>  |                  | Pu <sup>6+</sup> | Am <sup>4+</sup> |                  | Bk <sup>4+</sup> |                  |                  |                  | Md <sup>3+</sup>              | No <sup>3+</sup> |                  |                  |                  |                 |         |    |  |    |  |
|                  | protactinium(IV) | uranium (IV)     |                  | plutonium(VI)    | americium(IV)    |                  | berkelium(IV)    |                  |                  |                  | mendelevium (III)             | nobelium(III)    |                  |                  |                  |                 |         |    |  |    |  |