

Success 24/7 Chemistry: Ions... What you need to know.

Monatomic Ions with a single charge:

Periodic Table of the Elements

Atomic number — 14

Symbol — **Si**

Atomic mass — 28.086

Silicon — Name

| | | | | | | | | | | | | | | | | | | | | | | |
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| | 1 | | | | | | | | | | | | | | | | | 18 | | | | |
| | H 1.008 Hydrogen | | | | | | | | | | | | | | | | | He 4.0026 Helium | | | | |
| 2 | Li 6.941 Lithium | Be 9.012 Beryllium | | | | | | | | | | | | | | | B 10.81 Boron | C 12.011 Carbon | N 14.007 Nitrogen | O 15.999 Oxygen | F 18.998 Fluorine | Ne 20.179 Neon |
| 3 | Na 22.990 Sodium | Mg 24.305 Magnesium | | | | | | | | | | | | Al 26.982 Aluminum | Si 28.086 Silicon | P 30.974 Phosphorus | S 32.066 Sulfur | Cl 35.453 Chlorine | Ar 39.948 Argon | | | |
| 4 | K 39.098 Potassium | Ca 40.08 Calcium | Sc 44.956 Scandium | Ti 47.88 Titanium | V 50.942 Vanadium | Cr 51.996 Chromium | Mn 54.938 Manganese | Fe 55.847 Iron | Co 58.933 Cobalt | Ni 58.69 Nickel | Cu 63.546 Copper | Zn 65.39 Zinc | Ga 69.72 Gallium | Ge 72.61 Germanium | As 74.922 Arsenic | Se 78.96 Selenium | Br 79.904 Bromine | Kr 83.80 Krypton | | | | |
| 5 | Rb 85.468 Rubidium | Sr 87.62 Strontium | Y 88.906 Yttrium | Zr 91.224 Zirconium | Nb 92.906 Niobium | Mo 95.94 Molybdenum | Tc (98) Technetium | Ru 101.07 Ruthenium | Rh 102.906 Rhodium | Pd 106.42 Palladium | Ag 107.868 Silver | Cd 112.41 Cadmium | In 114.82 Indium | Sn 118.71 Tin | Sb 121.763 Antimony | Te 127.60 Tellurium | I 126.904 Iodine | Xe 131.29 Xenon | | | | |
| 6 | Cs 132.905 Cesium | Ba 137.33 Barium | La 138.906 Lanthanum | Hf 178.49 Hafnium | Ta 180.948 Tantalum | W 183.84 Tungsten | Re 186.207 Rhenium | Os 190.23 Osmium | Ir 192.22 Iridium | Pt 195.08 Platinum | Au 196.967 Gold | Hg 200.59 Mercury | Tl 204.383 Thallium | Pb 207.2 Lead | Bi 208.980 Bismuth | Po (209) Polonium | At (210) Astatine | Rn (222) Radon | | | | |
| 7 | Fr (223) Francium | Ra 226.025 Radium | Ac 227.028 Actinium | Rf (261) Rutherfordium | Db (262) Dubnium | Sg (263) Seaborgium | Bh (264) Bohrium | Hs (265) Hassium | Mt (266) Meitnerium | 110 (269) Darmstadtium | Mass numbers in parentheses are those of the most stable or most common isotope. | | | | | | | | | | | |
| Lanthanide Series | | | | Ce 140.12 Cerium | Pr 140.908 Praseodymium | Nd 144.24 Neodymium | Pm (145) Promethium | Sm 150.36 Samarium | Eu 151.97 Europium | Gd 157.25 Gadolinium | Tb 158.925 Terbium | Dy 162.50 Dysprosium | Ho 164.930 Holmium | Er 167.26 Erbium | Tm 168.934 Thulium | Yb 173.04 Ytterbium | Lu 174.967 Lutetium | | | | | |
| Actinide Series | | | | Th 232.038 Thorium | Pa 231.036 Protactinium | U 238.029 Uranium | Np 237.048 Neptunium | Pu (244) Plutonium | Am (243) Americium | Cm (247) Curium | Bk (247) Berkelium | Cf (251) Californium | Es (252) Einsteinium | Fm (257) Fermium | Md (258) Mendelevium | No (259) Nobelium | Lr (262) Lawrencium | | | | | |

Things to know:

Metals are positive (cations) and their names will not change.

Nonmetals are negative (anions) and the names will end in -ide when they are in ion form.

Write the ions for the following:

Lithium: _____

Sulfide: _____

Oxide: _____

Silver: _____

Magnesium: _____

Phosphide: _____

Monatomic Ions with more than one charge:

Some metals lose a varying number of electrons and are still stable. Therefore, they have more than one charge option. You will know what the charge is based on the roman numerals given behind the number.

Remember: Metals are always positive!

Ex:

Tin (II) _____

Copper (I) _____

Lead (IV) _____

Nickel (III) _____

Mixed Monatomic Practice

Write the ions for the following:

Magnesium _____

Copper (II) _____

Chloride _____

Cadmium _____

Chromium (III) _____

Phosphide _____

Polyatomic Ions:

2 or more atoms covalently bonded together that carry a charge.

WARNING: You MUST know these in order to be successful this unit.

Helpful Patterns:

- -ate & -ite both have oxygen in them.
- -ite has one less oxygen than -ate.
- When an H is added, add +1 to the overall charge.

Advice: study the “-ate”s first and then you will know the “-ite”s if you remember the helpful patterns.

Sulfate vs. Sulfite

Carbonate vs. Hydrogen Carbonate

Polyatomic Ion Practice:

Phosphate _____

Phosphite _____

Hydroxide _____

Permanganate _____

Cyanide _____

Acetate _____

Ammonium _____

All Ion Practice:

Nitrate _____

Nitrite _____

Nitride _____

Zinc _____

Rubidium _____

Copper (II) _____

Selenide _____