

NOMENCLATURE

Elements

Hydrogen	H	Chlorine	Cl	Arsenic	As
Helium	He	Argon	Ar	Selenium	Se
Lithium	Li	Potassium	K	Bromine	Br
Beryllium	Be	Calcium	Ca	Krypton	Kr
Boron	B	Scandium	Sc	Rubidium	Rb
Carbon	C	Titanium	Ti	Strontium	Sr
Nitrogen	N	Vanadium	V	Cadmium	Cd
Oxygen	O	Chromium	Cr	Silver	Ag
Fluorine	F	Manganese	Mn	Tin	Sn
Neon	Ne	Iron	Fe	Iodine	I
Sodium	Na	Cobalt	Co	Cesium	Cs
Magnesium	Mg	Nickel	Ni	Barium	Ba
Aluminum	Al	Copper	Cu	Gold	Au
Silicon	Si	Zinc	Zn	Mercury	Hg
Phosphorus	P	Gallium	Ga	Lead	Pb
Sulfur	S	Germanium	Ge	Bismuth	Bi
Uranium	U				

Polyatomic Ions

Most Common:

Ammonium ion	NH_4^+
Acetate ion	$\text{CH}_3\text{COO}^{1-}$
Carbonate ion	CO_3^{2-}
Hydrogen carbonate ion (bicarbonate ion)	HCO_3^{1-}
Hydroxide ion	OH^{1-}
Nitrate ion	NO_3^{1-}
Sulfate ion	SO_4^{2-}
Phosphate ion	PO_4^{3-}
Hydronium ion	H_3O^+

Less Common:

Chromate ion	CrO_4^{2-}
Dichromate ion	$\text{Cr}_2\text{O}_7^{2-}$
Oxalate ion	$\text{C}_2\text{O}_4^{2-}$
Permanganate ion	MnO_4^{1-}
Peroxide ion	O_2^{2-}
Nitrite ion	NO_2^{1-}
Sulfite ion	SO_3^{2-}
(mono)hydrogen phosphate ion	HPO_4^{2-}
dihydrogen phosphate ion	$\text{H}_2\text{PO}_4^{1-}$

Less Common:

Hypochlorite ion*	ClO^{1-}	Thiosulfate ion	$\text{S}_2\text{O}_3^{2-}$
Chlorite ion*	ClO_2^{1-}	Hydrogen sulfate ion (bisulfate ion)	HSO_4^{1-}
Chlorate ion*	ClO_3^{1-}	Cyanide ion	CN^{1-}
Perchlorate ion*	ClO_4^{1-}	Hydrogen sulfite ion (bisulfite ion)	HSO_3^{1-}

*May extend these names for the Br and I analogs.

Monoatomic ions

Group 1A Metal ions (+1 charge)	-add ion to root name	(sodium ion)
Group 2A Metal ions (+2 charge)	-add ion to root name	(barium ion)
Group 3A Metal ions (+3 charge)	-add ion to root name	(aluminum ion)
Zinc, Cadmium & Silver	-add ion to root name	(zinc ion)
Group 4A Nonmetals (-4 charge)	-change root name ending to ide & and ion	(carbide ion)
Group 5A Nonmetal ions (-3 charge)	-change root name ending to ide & add ion	(nitride ion)
Group 6A Nonmetal ions (-2 charge)	-change root name ending to ide & add ion	(oxide ion)
Group 7A Nonmetal ions (-1 charge)	-change root name ending to ide & add ion	(fluoride ion)
Hydrogen	(+1 charge) H^+ hydrogen ion; (- charge) H^- hydride ion	

Metals except Group 1A, 2A, 3A, zinc, cadmium and silver:

After root name add Roman numeral in parentheses to indicate charge, followed by ion.

Fe^{3+}	iron(III) ion	Fe^{2+}	iron(II) ion	Pb^{2+}	lead(II) ion
Cr^{3+}	chromium(III) ion	Cr^{2+}	chromium(II) ion	Sn^{2+}	tin(II) ion
Cu^{2+}	copper(II) ion	Cu^{1+}	copper(I) ion	Ti^{2+}	titanium(II) ion
Co^{3+}	cobalt(III) ion	Co^{2+}	cobalt(II) ion	Mn^{2+}	manganese(II) ion
Hg^{2+}	mercury(II) ion	Hg_2^{2+}	mercury(I) ion	Ni^{2+}	nickel(II) ion

Naming ionic compounds:

name cation name anion (dropping the “ion”)

examples:

NaCl	sodium chloride	Cu ₂ O	copper(I) oxide
Ag ₂ SO ₄	silver sulfate	NH ₄ NO ₃	ammonium nitrate

Naming binary molecular compounds

use the following prefixes to indicate the number of each atom in the formula

1	mono	4	tetra	7	hepta	10	deca
2	di	5	penta	8	octa		
3	tri	6	hexa	9	nona		

name the first element with the appropriate prefix, then the second element with prefix and the ending changed to -ide (the prefix “mono” is often omitted)

examples:

SF ₆	sulfur hexafluoride	N ₂ O	dinitrogen oxide
N ₂ O ₅	dinitrogen pentaoxide	PCl ₃	phosphorus trichloride

Naming acids

Name of an acid is related to the name of its anion:

Anion	(add H ⁺ ions)	Acid
_____ide ion	→	hydro_____ic acid
_____ate ion	→	_____ic acid
_____ite ion	→	_____ous acid

examples:

Cl ¹⁻	<u>chloride</u> ion	→	HCl _(aq)	<u>hydrochloric</u> acid
NO ₃ ¹⁻	<u>nitrate</u> ion	→	HNO ₃ _(aq)	<u>nitric</u> acid
SO ₄ ²⁻	<u>sulfate</u> ion	→	H ₂ SO ₄ _(aq)	<u>sulfuric</u> acid
ClO ¹⁻	<u>hypochlorite</u> ion	→	HClO _(aq)	<u>hypochlorous</u> acid
BrO ₂ ¹⁻	<u>bromite</u> ion	→	HBrO ₂ _(aq)	<u>bromous</u> acid