A Summary of the Nomenclature Rules of Inorganic Compounds

Ionic Compounds	Covalent Compounds	Acids
Metal Cations + Non-Metal Anions, or, Polyatomic Ions • Memorize the list of ions on the next two pages. • The positively charged cation leads both the compound name and formula. • Ions are combined in simple whole number ratios to yield a neutral ionic compound. These ratios become the subscripts in the compound formula. Polyatomic ions should be encased in parentheses in the compound formula if the subscript is ≥ 2. Note that ion charges do not appear in the final formula. • Ionic compound names are obtained by simply combining the cation name with the anion name. ***Never use prefixes!*** • If the metal cation can have more than one charge, the charge must be included in the compound name – appearing as a Roman numeral in brackets (Stock system).	**Simple binary compounds – only two different Non-Metal Atoms present** • The more metallic non-metal (further to the left or lower down in the Periodic Table) leads the compound name and formula. • The name of the second element always ends in __ide. • Subscripts in compound formulas indicate actual numbers of each atom present in a molecule of the compound. • Prefixes are used in compound names to indicate the numbers of each atom present. However, the prefix "mono" is dropped if there is only one atom of the first element. Memorize the list of prefixes 1-12: 1 mono 7 hepta 2 di 8 octa 3 tri 9 nona 4 tetra 10 deca 5 penta 11 undeca 6 hexa 12 dodeca • *Exception*: no prefixes at all are used in the names of covalent compounds of hydrogen (e.g., H_2S is hydrogen sulfide).	**Hydrogen Cations + Non-Metal Anions, or, Polyatomic Anions** • H always leads the formula. • Acids are in the aqueous state. • Like ionic compounds, the ions in acids are combined in simple whole number ratios to yield a neutral acid. These ratios become the subscripts in the acid formula. • The acid name depends on the name of the anion involved: H^{+1} + Anion = Acid __ide hydro__ic acid __ate __ic acid __ite __ous acid

Common Cations

Monatomic Main Group Metal Cations		Monatomic Transition Metal Cations		Polyatomic Cations	
Group 1A		Cd^{+2}	Cadmium	NH_4^{+1}	Ammonium
Li^{+1}	Lithium	Cr^{+2}	Chromium(II)	H_3O^{+1}	Hydronium
Na^{+1}	Sodium	Cr^{+3}	Chromium(III)		
K^{+1}	Potassium	Cr^{+6}	Chromium(VI)		
Rb^{+1}	Rubidium	Co^{+2}	Cobalt(II); Cobaltous		
Cs^{+1}	Cesium	Co^{+3}	Cobalt(III); Cobaltic		
Group 2A		Cu^{+1}	Copper(I); Cuprous		
Be^{+2}	Beryllium	Cu^{+2}	Copper(II); Cupric		
Mg^{+2}	Magnesium	Au^{+1}	Gold(I); Aurous		
Ca^{+2}	Calcium	Au^{+3}	Gold(III); Auric		
Sr^{+2}	Strontium	Fe^{+2}	Iron(II); Ferrous		
Ba^{+2}	Barium	Fe^{+3}	Iron(III); Ferric		
Group 3A		Mn^{+2}	Manganese(II)		
Al^{+3}	Aluminum	Mn^{+3}	Manganese(III)		
Ga^{+3}	Gallium	Mn^{+4}	Manganese(IV)		
In^{+1}	Indium(I)	Mn^{+7}	Manganese(VII)		
In^{+3}	Indium(III)	Hg_2^{+2}	Mercury(I); Mercurous		
Group 4A		Hg^{+2}	Mercury(II); Mercuric		
Sn^{+2}	Tin(II); Stannous	Ni^{+2}	Nickel(II); Nickelous		
Sn^{+4}	Tin(IV); Stannic	Ni^{+3}	Nickel(III); Nickelic *rare*		
Pb^{+2}	Lead(II); Plumbous	Ag^{+1}	Silver		
Pb^{+4}	Lead(IV); Plumbic	Ti^{+2}	Titanium(II)		
Group 5A		Ti^{+3}	Titanium(III)		
Bi^{+3}	Bismuth(III)	Ti^{+4}	Titanium(IV)		
Bi^{+5}	Bismuth (V)	Zn^{+2}	Zinc		

Common Anions

Monatomic Non-Metal Anions		Polyatomic Anions		Polyatomic Anions	
Group 7A		$C_2H_3O_2^{-1}$	Acetate	OH^{-1}	Hydroxide
F^{-1}	Fluoride	AsO_4^{-3}	Arsenate	IO_3^{-1}	Iodate
Cl^{-1}	Chloride	BO_3^{-3}	Borate	IO_4^{-1}	Periodate
Br^{-1}	Bromide	$B_4O_7^{-2}$	Tetraborate	MoO_4^{-2}	Molybdate
I^{-1}	Iodide	BrO^{-1}	Hypobromite	NO_2^{-1}	Nitrite
Group 6A		BrO_3^{-1}	Bromate	NO_3^{-1}	Nitrate
O^{-2}	Oxide	CO_3^{-2}	Carbonate	$C_2O_4^{-2}$	Oxalate
S^{-2}	Sulfide	HCO_3^{-1}	Bicarbonate	O_2^{-2}	Peroxide
Se^{-2}	Selenide	ClO^{-1}	Hypochlorite	MnO_4^{-1}	Permanganate
Te^{-2}	Telluride	ClO_2^{-1}	Chlorite	PO_4^{-3}	Phosphate
Group 5A		ClO_3^{-1}	Chlorate	HPO_4^{-2}	Hydrogen phosphate
N^{-3}	Nitride	ClO_4^{-1}	Perchlorate	$H_2PO_4^{-1}$	Dihydrogen phosphate
P^{-3}	Phosphide	CrO_4^{-2}	Chromate	SO_3^{-2}	Sulfite
As^{-3}	Arsenide	$Cr_2O_7^{-2}$	Dichromate	SO_4^{-2}	Sulfate
Group 4A		$C_6H_5O_7^{-3}$	Citrate	HSO_3^{-1}	Bisulfite
C^{-4}	Carbide	CN^{-1}	Cyanide	HSO_4^{-1}	Bisulfate
Group 1A		SCN^{-1}	Thiocyanate	$S_2O_3^{-2}$	Thiosulfate
H^{-1}	Hydride				