

Guidelines for Nomenclature

Chem1A, General Chemistry I

Common Base Element Names

Chemical Symbol	Element Name	Base Element Name
N	Nitrogen	nitro-
P	Phosphorous	phosph-
O	Oxygen	ox -
S	Sulfur	sulf-
F	Fluorine	fluor-
Cl	Chlorine	chlor-
Br	Bromine	brom-
I	Iodine	iod-

IONIC COMPOUNDS: METAL TO NONMETAL

The cation (metal or polyatomic ion) is always named first, with the anion (non-metal or polyatomic ion) named secondly.

For metals that form **PREDICTABLE** ions (Groups 1A/2A, Al^{3+} , Zn^{2+} , Ag^+ , polyatomic cations):

cation _ anion (+ ide if anion is an element)

Examples: Na_2S = sodium sulfide, CaF_2 = calcium fluoride, $(\text{NH}_4)_2\text{O}$ = ammonium oxide.

Group	1A	2A	6A	7A
Charge	+1	+2	-2	-1

For metals that form **UNPREDICTABLE** ions (Groups 1B-8B):

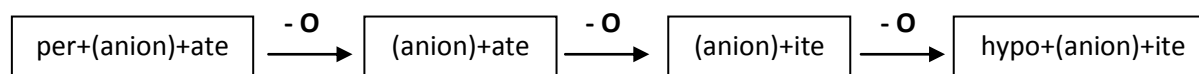
cation(charge of cation in Roman numerals) _ anion (+ ide if anion is an element)

Examples: FeCl_2 = iron(II) chloride, $\text{Pt}(\text{NO}_3)_4$ = platinum(IV) nitrate.

Common Polyatomic Ions

Anion Name	Formula and Charge	Base Name	Cation Name	Formula and Charge
Phosphate	PO_4^{3-}	phosphor-	Ammonium	NH_4^+
Carbonate	CO_3^{2-}	carbon-	Hydronium	H_3O^+
Sulfate	SO_4^{2-}	sulfur- (sulf-)		
Acetate	CH_3COO^-	acet-		
Nitrate	NO_3^-	nitr-		
Perchlorate	ClO_4^-	perchlor-		
Hydroxide	OH^-			

For **OXYANIONS**:



Examples: perchlorate (ClO_4^-) \rightarrow chlorate (ClO_3^-) \rightarrow chlorite (ClO_2^-) \rightarrow hypochlorite (ClO^-)

ACIDS: CHARGED COMPOUNDS CONTAINING H

For anions that end in “-ide”:

(hydro)anion base name(+ic) _ acid

Examples: HBr = hydrobromic acid, HF = hydrofluoric acid, H_2Se = hydroselenic acid.

For anions that end in “-ate”:

anion base name(+ic) _ acid

Examples: H_2SO_4 = sulfuric acid, H_3PO_4 = phosphoric acid.

For anions that end in “-ite”:

anion base name(+ous) _ acid

Examples: HNO_2 = nitrous acid, HClO_2 = chlorous acid.

MOLECULAR (COVALENT) COMPOUNDS: NONMETAL TO NONMETAL

The most metallic element (furthest left and down) is named first.

Exception: oxygen is always last, except when paired with fluorine.

(prefix+)first element name _ (prefix+)second element base name(+ide)

In the case that the first element's prefix is “mono-”, no prefix is used.

Prefixes for Molecular Compounds

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

Examples: H_2O = dihydrogen monoxide*, N_2O_4 = dinitrogen tetroxide*, ClF_4 = chlorine tetrafluoride.

* If oxygen is the second element and its intended prefix ends with a vowel, that last vowel is dropped from the prefix leaving only the “o” from the base element name (“ox-”).