

Chemical Name and Formula Rules

* Before naming any compound, you **MUST** determine if it is ionic or molecular.

Ionic Compounds (a metal and non-metal(s))

Writing Formulas: Cross over Method

Step 1: Find the charge on each element or polyatomic (groups of non-metals with an overall charge).

Step 2: Cross over charge #'s to quantity #'s. Use brackets to designate more than one polyatomic - they are usually treated as a single unit because they move as a group.

Step 3: Reduce if possible

Ex. Magnesium Fluoride Mg^{2+} F^{-} = MgF_2

Magnesium Oxide =

Silver Nitrate =

Iron (III) Sulphate =

Naming:

Step 1: Give the metal its full name.

Step 2: Add a Roman numeral for metals that have more than one charge.

Step 3: If ending is

- a) A non-metal: Name non-metal and change the ending to 'ide'
- b) A polyatomic: Leave as polyatomic name (don't change).

Ex. $FeCl_2$ = Iron (II) Chloride

$NaCl$ =

$BaSO_4$ =

PbO =

PbO_2 =

Molecular Compounds (2 or more non-metals)

Naming:

Step 1: Give the first atom its full name. Use a prefix on element name to indicate the # of atoms it contains.

Step 2: Give the second atom its full name. Use a prefix on element name to indicate the # of atoms it contains.

Step 3: Change the ending to "ide"

# of atoms	Prefix
1	Mono <small>**except on the first non-metal**</small>
2	Di
3	Tri
4	Tetra
5	Penta
6	Hexa
7	Hepta
8	Octa
9	Nona
10	Deca

Ex. CO_2 = Carbon Dioxide

S_2O =

C_3H_8 =

Writing Formulas

Use the prefixes to determine how many of each atom you have of each element!

Note: DO NOT reduce molecular compounds.

Ex. Phosphorous Pentabromide =

Dichlorine Moniodide =

Dicarbon Hexahydride =

Ionic Compounds Worksheet:

Write the formula for:

- a) Magnesium oxide _____
- b) Sodium Carbonate _____
- c) Sodium fluoride _____
- d) Copper (I) Bromide _____
- e) Potassium Hydroxide _____
- f) Iron (III) Sulfate _____
- g) Lead (II) oxide _____
- h) Potassium sulfide _____
- i) Lithium iodide _____
- j) Ammonium Chloride _____
- k) Tin (IV) sulfide _____
- l) Magnesium Nitride _____
- m) Aluminum Phosphate _____
- n) Copper (II) Nitrate _____

Write the names for:

- a) AlCl_3 _____
- b) CuCl_2 _____
- c) K_2SO_4 _____
- d) FeBr_3 _____
- e) Li_2CO_3 _____
- f) Na_3N _____
- g) PbS _____
- h) KBr _____
- i) CaCO_3 _____
- j) NiO _____
- k) $\text{Al}(\text{OH})_3$ _____
- l) BeF_2 _____
- m) $\text{Pb}_3(\text{PO}_4)_2$ _____
- n) Mg_3P_2 _____

Molecular Compounds Worksheet:

Name the following compounds.

- a) NI_3 _____
- b) CCl_4 _____
- c) OF_2 _____
- d) P_2O_5 _____
- e) N_2O _____
- f) SO_2 _____
- g) N_2O_4 _____
- h) ICl _____
- i) H_2O_2 _____
- j) BrF_5 _____

2. Write the formula for each compound.

- a) Carbon monoxide _____
- b) Sulphur tetraoxide _____
- c) Dinitrogen tetraoxide _____
- d) Carbon disulphide _____
- e) Nitrogen tribromide _____
- f) Selenium difluoride _____
- g) Phosphorous triiodide _____
- h) Iodine heptafluoride _____
- i) Tricarbon octahydride _____
- j) Pentacarbon nonachloride _____

Naming Compounds

Before you begin, label beside each compound I for Ionic, or M for Molecular.

Write the formulas for the following:

- 1) sodium bromide

- 2) lead(IV) chloride

- 3) cobalt(III) nitrate

- 4) diphosphorous monosulfide

- 5) aluminum chloride

- 6) iron(II) oxide

- 7) aluminum hydrogen carbonate

- 8) magnesium sulfate

- 9) lithium oxide

- 10) dinitrogen tetroxide

- 11) mercury(II) nitride

- 12) calcium oxide

- 13) phosphorous pentabromide

- 14) strontium hydroxide

- 15) magnesium fluoride

- 16) chromium(II) sulfide

Name the following compounds:

- 1) KCl _____
- 2) Cu₂O _____
- 3) KOH _____
- 4) P₂O₃ _____
- 5) Li₂O _____
- 6) FeCO₃ _____
- 7) Al₂(SO₄)₃ _____
- 8) SeCl₄ _____
- 9) Pb(OH)₂ _____
- 10) P₄O₇ _____
- 11) CaBr₂ _____
- 12) FePO₄ _____
- 13) CrO _____
- 14) MnF₂ _____
- 15) PbI₂ _____
- 16) SCl₆ _____
- 17) CaS _____
- 18) RbI _____