

Naming Ionic Compounds

Type I: Diatomic

Writing Names from Formulas

1. Identifying the cation as a Group I metal , Group II metal, Aluminum, Zinc, or Silver
2. Identify the anion as a nonmetal
3. Name the cation (the metal) with its full name
4. Name the anion (the nonmetal) by changing the ending to -ide

Example: NaCl

cation: sodium

anion: chlorine

Name: sodium *chloride*

NaCl Sodium Chloride

KBr Potassium Bromide

MgI₂ Magnesium Iodide

BeO Beryllium Oxide

CaF₂ Calcium Fluoride

Cs₂S Cesium Sulfide

AlCl₃ Aluminum Chloride

ZnO Zinc Oxide

Ag₃P Silver Phosphide

Writing Formulas from Names

1. Identify charge of cation (1+, 2+, 3+)
2. Identify charge of anion (1-, 2-, 3-)
3. Balance the charges- **criss cross!**
4. The charge of the cation becomes the subscript of the anion
5. The charge of the anion becomes the subscript of the cation
6. Reduce subscripts if necessary

Write the formula from the name:

Aluminum Sulfide **Al_2S_3**

Barium Carbide **Ba_2C**

Lithium Sulfide **Li_2S**

Potassium Oxide **K_2O**

Zinc Chloride **$ZnCl_2$**

Silver Fluoride **AgF**

Sodium Nitride **Na_3N**

Potassium Iodide **KI**

Calcium Oxide **CaO**

Type I: Polyatomic

Writing Names from Formulas

1. Identifying the cation as a Group I metal , Group II metal, Aluminum, Zinc, or Silver
2. Identify the anion as a polyatomic ion
3. Name the cation (the metal) with its full name
4. Name the anion (the polyatomic) with its full name

Example: KOH

cation: potassium & anion: hydroxide

Name: potassium hydroxide

KCN Potassium Cyanide

NaOH Sodium Hydroxide

CaCO₃ Calcium Carbonate

Li₂SO₃ Lithium Sulfite

Cs₃PO₄ Cesium Phosphate

NH₄Cl Ammonium Chloride

FrClO₂ Francium Chlorite

MgSiO₃ Magnesium Silicate

BaC₂O₄ Barium oxalate

Writing Formulas from Names (polyatomics)

1. Identify charge of cation (1+, 2+, 3+) --(write it over the element name)
2. Identify charge of polyatomic ion (1-, 2-, 3-) --(write it over the polyatomic)
3. Balance the charges- if equal then just one of each
4. The charge of the cation becomes the subscript of the polyatomic- use brackets around polyatomic if more than 1
5. The charge of the polyatomic becomes the subscript of the cation
6. Reduce subscripts if necessary

Writing Formulas from Names (polyatomics)

silver nitrate AuNO_3

magnesium sulfate MgSO_4

calcium hydroxide Ca(OH)_2

strontium chlorate $\text{Sr(ClO}_3)_2$

barium cyanide Ba(CN)_2

zinc silicate $\text{Zn(SiO}_3)$

aluminum dichromate $\text{Al}_2(\text{Cr}_2\text{O}_7)_3$

ammonium sulfate $(\text{NH}_4)_2\text{SO}_4$

potassium permanganate KMnO_4

Transition Metals

- For transition metals, there is no easy pattern for which cation they form
- If we are given the name, we will be given a roman numeral- the roman numeral is the **charge** of the cation!

Writing Formulas from Names (transition metals)

1. Identify charge of cation transition metal (roman numeral) --(write it over the element name)
2. Identify charge of anion or polyatomic ion (1-, 2-, 3-) --(write it over the anion/polyatomic)
3. Balance the charges- if equal then just one of each
4. The charge of the cation becomes the subscript of the anion or (polyatomic- use brackets around polyatomic if more than 1 polyatomic)
5. The charge of the anion/polyatomic becomes the subscript of the cation
6. Reduce subscripts if necessary

iron(II) oxide $Fe^{+2} O^{-2}$ FeO

iron(III) oxide $Fe^{+3} O^{-2}$ Fe_2O_3

chromium(II) phosphate $Cr^{+2} PO_4^{-3}$ $Cr_3(PO_4)_2$

chromium(III) phosphate $Cr^{+3} PO_4^{-3}$ $CrPO_4$

manganese (II) fluoride $Mn^{+2} F^{-1}$ MnF_2

manganese (III) fluoride $Mn^{+3} F^{-1}$ MnF_3

iron(III) hydroxide $Fe^{+3} OH^{-1}$ $Fe(OH)_3$

lead(IV) sulfite $Pb^{+4} SO_3^{-2}$ $Pb (SO_3)_2$

mercury(I) sulfide $Hg^{+1} S^{-2}$ Hg_2S

- Now you practice p. 20-21
- Then Molecular compounds!