

Recall: There are 3 categories of IONIC compounds that we deal with:

1. BINARY Ionic
    - a. Simple Binary Ionic – simple ions (only single ion charges) – covered in Lesson 1 (review of Gr.10)
    - b. Multivalent ions – more than one charge)
  2. POLYATOMIC ions (complex ions) –also a review of Gr.10 (with one a couple of new ideas added)
  3. Hydrates
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### POLYATOMIC IONS

Definition: a group of covalently bonded atoms that has a net charge (positive or negative).

Also known as \_\_\_\_\_ - group of atoms that tend to stay together during most chemical reactions

You will need to know the common polyatomic ions by memory. Please review the following polyatomic and their charges:

Polyatomic/Radical with Ionic Charge	NAME of Polyatomic/Radical
$\text{OH}^{1-}$	
$\text{NH}_4^{1+}$	
$\text{NO}_3^{1-}$	
$\text{ClO}_3^{1-}$	
$\text{CO}_3^{2-}$	
$\text{SO}_4^{2-}$	
$\text{PO}_4^{3-}$	
	Cyanide
	Cyanate
	Thiocyanate
	Thiosulfate
	Chromate
	Dichromate
	Oxalate
	Acetate
	Permanganate

Naming Examples:

- a)  $\text{NaC}_2\text{H}_3\text{O}_2$ : \_\_\_\_\_
- b)  $\text{KOH}$ : \_\_\_\_\_
- c)  $\text{Ca}(\text{MnO}_4)_2$ : \_\_\_\_\_

#### Rules for NAMING Polyatomic Compounds:

- Name the METAL
- Determine the Polyatomic.
- Name the Polyatomic. Note: the ending may not end with -ide.

Examples for Writing Formulas:

- a) Potassium nitrate: \_\_\_\_\_
- b) Sodium sulfate: \_\_\_\_\_
- c) Calcium phosphate: \_\_\_\_\_

#### Rules for writing FORMULAS for Polyatomic Compounds:

- Write the SYMBOL of the metal and its CHARGE on top of the metal.
- Write the FORMULA for the POLYATOMIC and its CHARGE on top of the polyatomic.
- Criss-cross and reduce subscripts if possible. Make sure you include BRACKETS where necessary

EASY, Right???

But wait, there's more!

**HYDROGEN RADICALS:** Adding  $H^+$  to radicals causes the charge on the radical to change.

Examples:

Original Polyatomic + $H^+$	NAME of the Polyatomic WITH Hydrogen Radical
$CO_3^{2-} + 1H^+$	

Example: Name this:  $NaHCO_3$ : \_\_\_\_\_

Give the formula for Potassium bisulfate: \_\_\_\_\_

Almost done! Let's consider ONE MORE fun fact about polyatomics:

**Deriving "ites" from "ates"**

Per _____ ate	_____ ates	_____ ites	Hypo _____ ite
$NO_4^{1-}$	$NO_3^{1-}$	$NO_2^{1-}$	$NO^{1-}$
$ClO_4^{1-}$	$ClO_3^{1-}$	$ClO_2^{1-}$	$ClO^{1-}$
$CO_4^{2-}$	$CO_3^{2-}$	$CO_2^{2-}$	$CO^{2-}$
$SO_5^{2-}$	$SO_4^{2-}$	$SO_3^{2-}$	$SO_2^{2-}$
$PO_5^{3-}$	$PO_4^{3-}$	$PO_3^{3-}$	$PO_2^{3-}$

This is hard to remember! Let's use this pneumonic device: