

Transition Metals

- * Some transition metals can form more than one ion
- * In other words some have more than 1 ion form



* Use roman numeral to show which ion form is present

<u>Metal Ion charge</u>	<u>Roman Numeral</u>
1+	I
2+	II
3+	III
4+	IV
5+	V
6+	VI
7+	VII

* Ni^{2+} or Nickel II, is called Nickel two.

* Fe^{3+} or Iron III, is called Iron three

Examples

- * Iron (III) chloride
- * Tin (IV) oxide
- * Manganese (II) oxide

- * Hg_2O
- * Co_2S_3

*** The key is to first remember that the transition metals have more than ONE possible charge**

Polyatomic

Polyatomic

- * A polyatomic ion
- * Is a group of atoms.
- * Has an overall ionic charge.
- * Some examples of polyatomic ions are
 - * NH_4^+ ammonium OH^- hydroxide
 - * NO_3^- nitrate NO_2^- nitrite
 - * CO_3^{2-} carbonate PO_4^{3-} phosphate

* The names of common polyatomic anions

* Some end in ate.

* NO_3^- nitrate PO_4^{3-} phosphate

* Some end in ite.

* NO_2^- nitrite PO_3^{3-} phosphite

* Some will have hydrogen in name (or bi).

* HCO_3^- hydrogen carbonate

* ClO_4^- perchlorate one oxygen more

* ClO_3^- chlorate most common form

* ClO_2^- chlorite one oxygen less

* ClO^- hypochlorite two oxygens less

- * If you need two or more Polyatomic ions, YOU MUST USE Parentheses with the subscript.
- * Write the formula for Cu^{+2} and NO_3^{-1}
- * You need 1 Cu^{+2} and 2 NO_3^{-1}
- * You would write it like this: $\text{Cu}(\text{NO}_3)_2$
- * The 2 tells us we need 2 of the NO_3^{-1}

* The positive ion is named first followed by the name of the polyatomic ion.

* NaNO_3 sodium nitrate

* K_2SO_4 potassium sulfate

* $\text{Fe}(\text{HCO}_3)_3$ iron(III) bicarbonate

* or iron(III) hydrogen carbonate

* $(\text{NH}_4)_3\text{PO}_3$ ammonium phosphite

- * The formula of an ionic compound
- * Containing a polyatomic ion must have a charge balance that equals zero(0).
- * Na^+ and $\text{NO}_3^- \rightarrow \text{NaNO}_3$
- * With two or more polyatomic ions encloses the polyatomic ions in parentheses.
- * Mg^{2+} and $2\text{NO}_3^- \rightarrow \text{Mg}(\text{NO}_3)_2$