Ionic Compounds

An ionic compound, for the purposes of naming, consists of a metal combined with a non-metal or a polyatomic ion, *e.g.,* sodium and chlorine (NaCl) or barium and nitrate ($Ba(NO_3)_2$).

Metal (Groups 1,2,3) + Non-metal or ion

Metal + Non-metal (e.g., Na + Cl)

- Rule: Name of metal + name of non-metal + "-ide" suffix

    e.g., NaCl →   Sodium chloride

Metal + polyatomic ion   (e.g., Na + CO₃)

- Rule: Name of metal + name of ion

    e.g., Na_2CO_3 →   Sodium carbonate

Metal (Transition metals) + Non-metal or ion

Some metals (mostly transition metals) have multiple valence values, so you need to specify which value the metal has in the compound you are naming. You do this by placing the metal's valence value as roman numerals in parentheses immediately after the metal's name.

Metal + Non-metal (e.g., Fe + O)
Metal + polyatomic ion (e.g., Fe + SO₄)

- Rule: Metal name (valence/charge) non-metal/ion name

    e.g., CuO →   Copper (II) oxide
         $Fe_3(PO_4)_2$ →   Iron (II) phosphate

Non-metal + Non-metal

- Rule: Prefix + 1st element + prefix + 2nd element + "ide"

    e.g., P_2O_3 →   diphosphorous trioxide
         CF_4 →   carbon tetraflouride
                          (note no "mono" for first element)

Non-metal Prefixes			
1	Mono	6	Hexa
2	Di	7	Hepta
3	Tri	8	Octa
4	Tetra	9	Nona
5	Penta	10	Deca

Naming Acids

Binary Acids
Hydrogen + one non-metal element

- Rule: "Hydro" + name of non-metal + "-ic" suffix Acid

  The suffix replaces the "-ine" that ends the original element name.

  e.g., HCl → Hydrochloric acid

Ionic Acid
Hydrogen + polyatomic ion

The name of one of these acids is derived from the name, and in particular the suffics, of the polyatomic ion. Note that it's not possible to derive these names without knowing the name of the ion.

Ion name ends in "-ate"

- Rule: Name of ion with "-ate" replaced by "-ic" Acid

  The ion name is massaged somewhat to make pronounciation smoother.

  e.g., H_2CO_3 (Carbonate ion) → Carbonic acid

  H_2SO_4 (Sulfate ion) → Sulfuric acid

Ion name ends in "-ite"

- Rule: Name of ion with "-ite" replaced by "-ous" Acid

  The ion name is massaged somewhat to make pronounciation smoother.

  e.g., HNO_2 (Nitrite ion) → Nitrous acid

  H_2SO_3 (Sulfite ion) → Sulfurous acid