**Writing Net Ionic Equations**

Compounds split up 100% into ions (in water) if they are ionic compounds, strong acids, or strong bases.

**Ionic Compounds** = Metal & Nonmetal

Example: NaCl(s) 🡪 Na+(aq) + Cl –(aq)

**Strong Acids** = H & Nonmetal

Example:

* HCl = hydrochloric acid
* HBr = hydrobromic acid
* HI = hydroiodic acid
* HNO3 = nitric acid
* HClO4 = phosphoric acid

HCl(aq) 🡪 H +(aq) + Cl –(aq)

H3PO4(aq) 🡪 3H+(aq) + PO43-(aq)

**Strong Bases** = M & OH

* Group 1A – OH Ex : NaOH
* Group 2A – OH Ex : Mg(OH)2

NaOH(aq) 🡪 Na+(aq) + OH-(aq)

Mg(OH)2(aq) 🡪 Mg2+(aq) + 2OH-(aq)

**N.I.E.**

Mg(OH)2(aq) + HsSO4(aq) 🡪 Mg2+SO42-(aq) + H2O(l)

Mg(OH)2(aq) + HsSO4(aq) 🡪 Mg2+SO42-(aq) + 2H2O(l)

~~Mg~~~~2+~~ + 2OH- + 2H+ + ~~SO~~~~4~~~~2~~- 🡪 ~~Mg~~~~2+~~ + ~~SO~~~~4~~~~2~~- + 2H2O

2OH-(aq) + 2H+(aq)🡪 2H2O(l)

Example 1: Complete the double replacement reaction and then reduce it to the net ionic equation.

**NaOH(aq) + MgCl2(aq) 🡪 ??**

First, predict the products of this reaction using your knowledge of double replacement reactions (remember the cations and anions “switch partners”).

**2NaOH(aq) + MgCl2(aq) 🡪 2NaCl + Mg(OH)2**

Second, consult the solubility rules to determine if the products are soluble.

**2NaOH(aq) + MgCl2(aq) 🡪 2NaCl(aq) + Mg(OH)2(s)**

Third, separate the reactants into their ionic form, as they would exist in an aqueous solution. Be sure to balance both the electrical charge and the number of atoms:

**2Na+(aq) + 2OH-(aq) + Mg2+(aq) + 2Cl-(aq) 🡪 Mg(OH)2(s) + 2Na+(aq) + 2Cl-(aq)**

Lastly, eliminate the ions that occur on both sides of the equation unchanged.

**~~2Na~~~~+~~~~(aq)~~ + 2OH-(aq) + Mg2+(aq) + ~~2Cl~~~~-~~~~(aq)~~ 🡪 Mg(OH)2(s) + ~~2Na~~~~+~~~~(aq)~~  + ~~2Cl~~~~-~~~~(aq)~~**

**Mg2+(aq) + 2OH-(aq) -----> Mg(OH)2(s)**