***Double Replacement Reactions (aka Metathesis Reactions)***

They only occur if at least ***one*** of the three following things happens:

1. A precipitate is formed
   1. Use your solubility rules to determine.
2. A molecule or weak acid is formed
   1. Molecule – covalent compound
      1. Water (H2O) or ammonia (NH3) are common
   2. Weak Acid
      1. Most binary acids are strong, except HF(aq) and H2S(aq)
      2. A weak ternary acid is determined by comparing the number of oxygen to hydrogen. If the difference is less than 2, it is a weak acid.
3. A gas is formed
   1. Watch out for binary acids as products….they bubble out of solution. HCl(g)…H2S(g)
   2. Watch out for substances that spontaneously decompose
      1. H2CO3 will become H2O + CO2(g)
      2. H2SO3 will become H2O + SO2(g)
      3. NH4OH will become H2O + NH3(g))
      4. (NH4)2O will become H2O + 2 NH3(g)

When to dissociate?

1. Must be aqueous… NEVER DISSOCIATE SOLIDS, LIQUIDS, or GASES.
2. If it is an acid, it must be strong, Refer to #2b above……NEVER DISSOCIATE WEAK ACIDS