For an exchange reaction to proceed, there must be something (a new product) DRIVING the reaction.

3 kinds of exchange chemistry:

1. Reactions that form PRECIPITATES (insoluble ionic compounds)

2. Reaction that form STABLE MOLECULES like water
   - if water forms, reaction is called "neutralization"

3. Reactions that form UNSTABLE MOLECULES that break down into other small molecules, often gases.

If any of these three possibilities form from the "ion soup", a reaction will occur.

If not, NO reaction occurs.

PRECIPITATION

- Form an insoluble ionic compound

Experiment 10 in your laboratory involves EXCHANGE REACTIONS!

$MgCl_2(aq) + Na_3PO_4(aq) \longrightarrow$???

Mg^{2+} Cl^- Na^+ PO_4^{3-}

Potential products:

$Na^+ Cl^-$ / $NaCl$

Mg^{2+} PO_4^{3-}

Mg^{2+} PO_4^{3-}

Mg^{2+} / $Mg_3(PO_4)_2$

Remember, IONS exchange partners. That means that you need to write out the IONS, including their charges, and pair them up. The formulas of the products are controlled by the CHARGES of the IONS in the new compounds!

$3MgCl_2(aq) + 2Na_3PO_4(aq) \longrightarrow 6NaCl(aq) + Mg_3(PO_4)_2(s)$ ✓

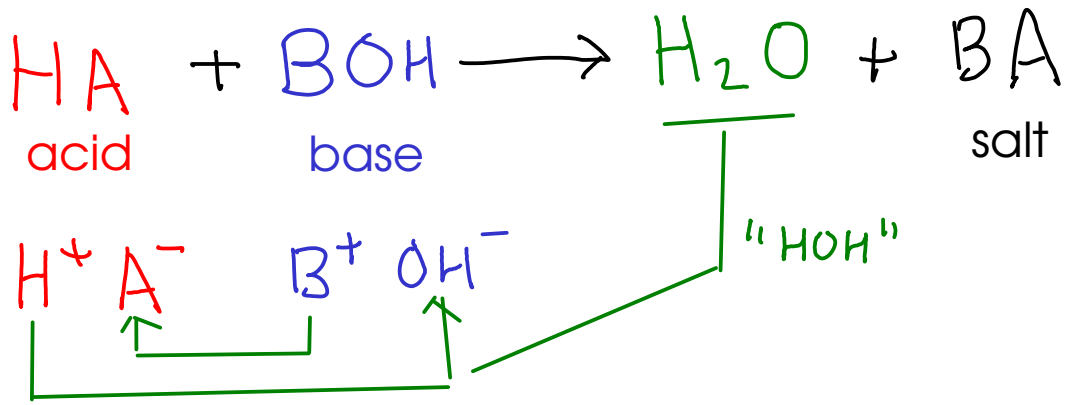
- Does a solid (insoluble) ionic compound form? Check DATA (p 172 in book)

* When writing exchange reactions, figure out the formulas of the products FIRST, and THEN balance the equation.

FORMATION OF STABLE MOLECULES

- There are several stable molecules that may be formed in double replacement reactions, but the most common is WATER!

- Double replacement reactions that form water are also called "neutralizations"



* To make water (H_2O), you need a source of hydrogen ion (H^+) and hydroxide ion (OH^-)

ACIDS

- compounds that release hydrogen ion (H^+), when dissolved in water.

Properties of acids:

- Corrosive: React with most metals to give off hydrogen gas
- Cause chemical burns on contact
- Taste sour (like citrus - citric acid!)
- Changes litmus indicator to RED

BASES

- Substances that release hydroxide ion (OH^-) when dissolved in water

Properties of bases:

- Caustic: Attack and dissolve organic matter (think lye, which is NaOH)
- Cause skin/eye damage on contact
- Taste bitter
- changes litmus indicator to BLUE

Due to the dissolving action of base on your skin, bases will feel "slippery". The base ITSELF is not particularly slippery, but what's left of your skin IS!