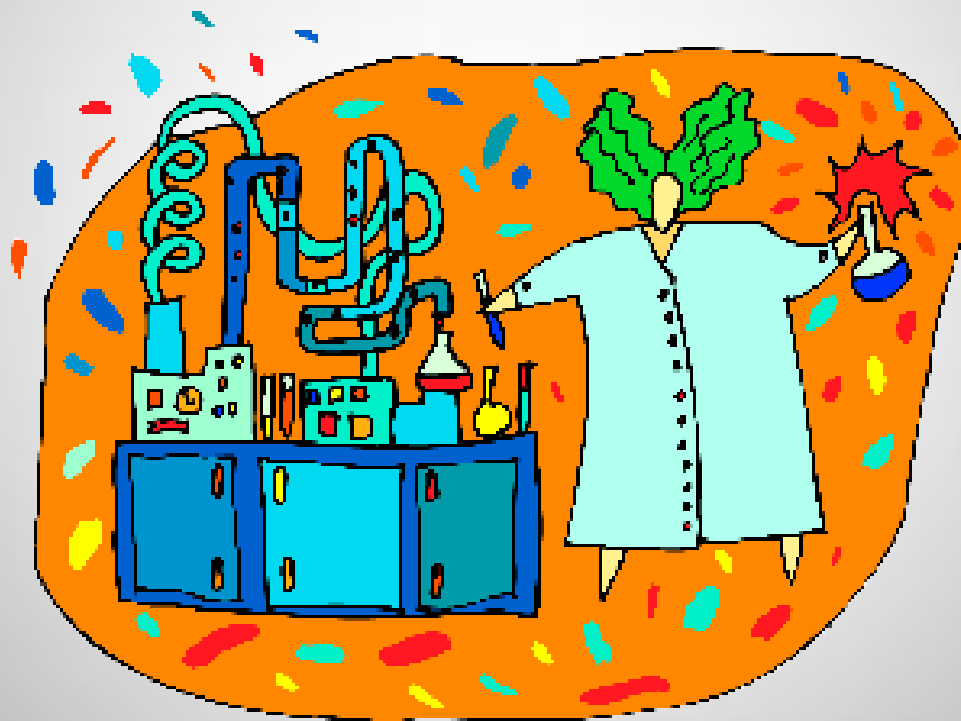


Neutralization Reactions

Mixing Acids & Bases

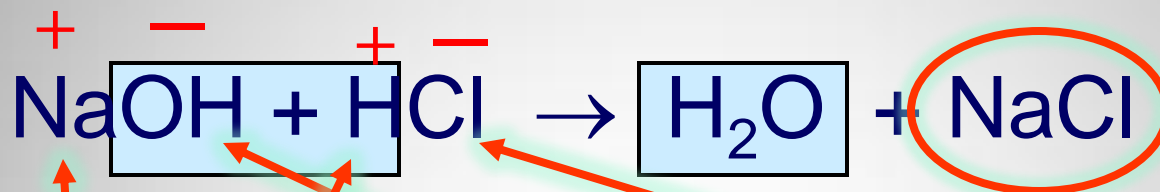


Acid/Base Neutralization

- A **salt** is any compound that can be derived from the neutralization of an acid and a base.
- The word "**neutralization**" is used because the acid and base properties of H^+ and OH^- are destroyed or neutralized.
- In the reaction, H^+ and OH^- combine to form HOH or H_2O (water molecules).
- A neutralization reaction is a type of *double replacement* reaction.

Writing neutralization equations

When acids and bases are mixed, a salt forms



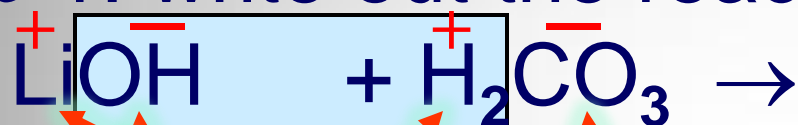
base + acid → water + salt

The cation (metal) from the base and the anion acid join to form the salt. The OH from the base and the H from the acid join to form water .

Writing neutralization equations

Example: Write the chemical reaction when lithium hydroxide is mixed with carbonic acid.

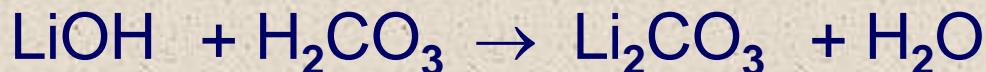
Step 1: write out the reactants



Step 2: determine products... (make sure the salt is written with correct subscripts! Refer to Oxidation Chart.)



Remember the "criss-cross" method-Ch. 20

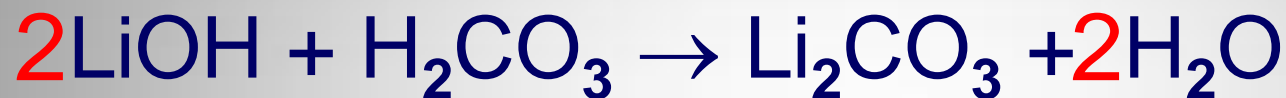


Writing neutralization equations

Remember balancing equations...

Step 3: balance the equation

Ch. 21 (use coefficients only)



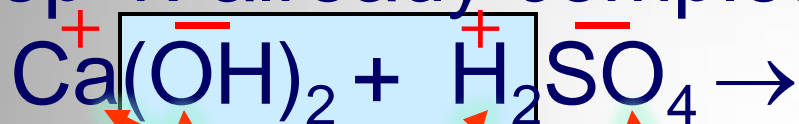
lithium hydroxide + carbonic acid \rightarrow lithium carbonate + water

Writing neutralization equations

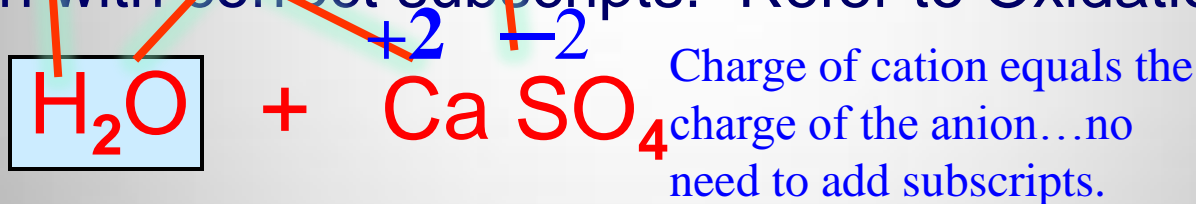
Example: Complete the neutralization reaction...



Step 1: already completed for you



Step 2: determine products... (make sure the salt is written with correct subscripts! Refer to Oxidation Chart.)

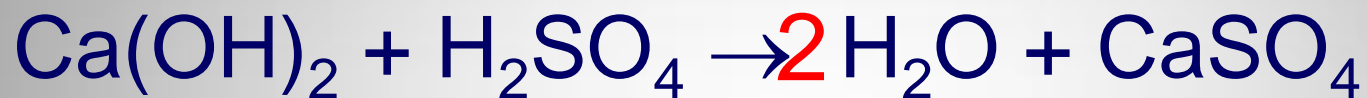


Writing neutralization equations

Step 3: balance the equation

Remember balancing equations...

Ch. 21 (use coefficients only)



calcium hydroxide + sulfuric acid \rightarrow calcium sulfate + water

Writing neutralization equations

Example: Complete the neutralization reaction...

iron(II) hydroxide + phosphoric acid

Step 1: write out the reactants ...(make sure the acid and base are written with correct subscripts! Oxidation Chart.)

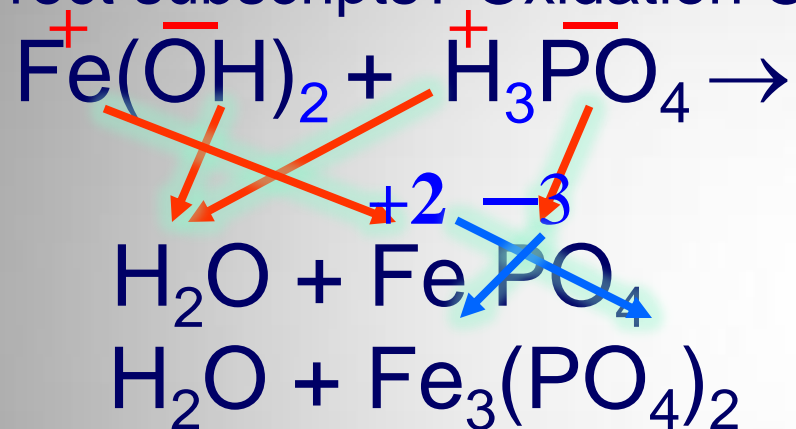


Think "criss-cross" Method.



Writing neutralization equations

Step 2: determine products... (Is the salt written with correct subscripts? Oxidation Chart.)



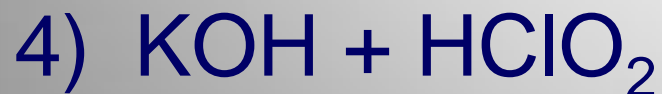
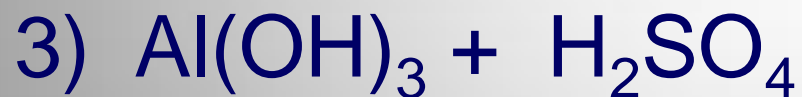
Step 3: balance the equation Remember balancing equations...
Ch. 21 (use coefficients only)



iron II hydroxide + phosphoric acid → iron II phosphate + water

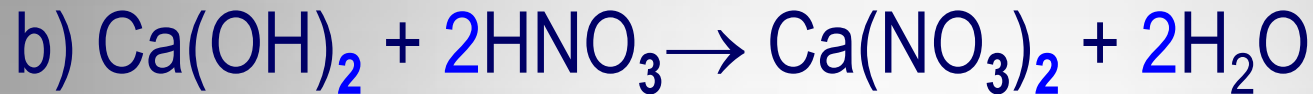
Practice

Write balanced chemical equations for these neutralization reactions.

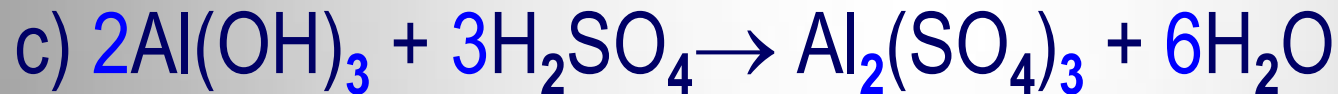




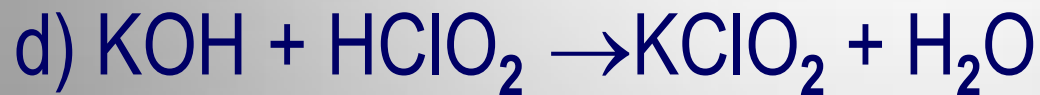
barium hydroxide + hydrochloric acid \rightarrow barium chloride



calcium hydroxide + nitric acid \rightarrow calcium nitrate



aluminum hydroxide + sulfuric acid \rightarrow aluminum sulfate



potassium hydroxide + chlorous acid \rightarrow potassium chlorite