Classification of Reactions

Classification of Reactions

- There are 5 major classifications of reactions:
  - _____
  - _____
  - _____
  - _____
  - _____

Synthesis (Combination)

- _____– when 2 or more substances react to produce 1 product
- Of the form: _____
- Examples:
  - 2 Fe + 3 Cl_2 → 2 $FeCl_3$
  - 2 Na + Cl_2 → 2NaCl
  - CaO + H_2O → $Ca(OH)_2$
  - Mg + O_2 → MgO

Decomposition

- _____– when a single compound breaks down into 2 or more compounds
- Of the form: _____
- Note that this is the exact opposite of synthesis
- Examples:
  - 2 Na_3N → 6 Na + N_2
  - NH_4NO_3 → N_2O + 2H_2O
  - 2H_2O → 2 H_2 + O_2

Combustion

- _____– when O_2 combines with a hydrocarbon to form CO_2 and H_2O
- Of the form: _____
- For example:
  - $CH_4 + 2\ O_2 \rightarrow CO_2 + 2H_2O$
  - $2CH_3OH + 3O_2 \rightarrow 2CO_2 + 4H_2O$

When Balancing Combustion Reactions

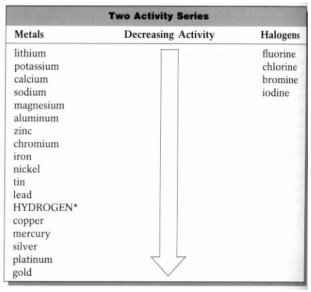
- Put a _____ in front of the hydrocarbon to start.
- Balance them in the order _____
- Make sure your answer is in the lowest whole number ratio

Single Replacement

- _____– when the atoms of one element replace the atoms of another element in a compound
- Of the form : _____
- For example:
  - $2\ Li + 2HOH \rightarrow 2\ LiOH + H_2$
  - $Cu + 2AgNO_3 \rightarrow 2\ Ag + Cu(NO_3)_2$

Activity Series

Page 288 Figure 10-10 in your text book



Single Replacement Reactions

- In order for a single replacement reaction to occur, the element that is _____ must be strong enough to push the other element out of the way.
- The activity series show you the relative strength of the elements.
- In order for the reaction to occur, the lone element must be above the element in the compound
- Otherwise…NO REACTION → NR

Single Replacement Reactions

- You need to know which chart you are to look at…metals or halogens.
- A metal can replace another metal
- A halogen can replace another halogen

Will these reactions occur?

- Will the following reaction occur? If so, complete and balance the reaction.
- Ag + $Cu(NO_3)_2$ →

Will these reactions occur?

- Will the following reaction occur? If so, complete and balance the reaction.
- Mg + $AlCl_3$ →

Will these reactions occur?

- Will the following reaction occur? If so, complete and balance the reaction.
- Br_2 + $MgCl_2$ →

Double Replacement (Metathesis)

- _____– a reaction involving the exchange of ions between 2 compounds
- Of the form: _____
- Examples:
  - $Pb(NO_3)_2 + 2KI \rightarrow PbI_2 + 2KNO_3$
  - $Na_2CO_3 + 2AgNO_3 \rightarrow 2NaNO_3 + Ag_2CO_3$

Double Replacement (Metathesis)

- In order for a double replacement reaction to take place, one of 3 things must be formed:
- _____
- _____
- _____

Example

- Sodium chloride reacts with silver chloride

Example

- Hydrochloric acid reacts with calcium hydroxide