Classifying Chemical Reactions

<u>Synthesis</u>: When two or more elements or compounds combine to make a more complex substance.

Ex:
$$2H_2 + O_2 \rightarrow 2H_2O$$
 or $A + B \rightarrow AB$

<u>Decomposition</u>: breaks down compounds into simpler products.

Ex:
$$2H_2O_2 \rightarrow 2H_2O + O_2$$
 or AB \rightarrow A + B

Single replacement: One element replaces another in a compound.

Ex:
$$2Cu_2O + C \rightarrow 4Cu + CO_2$$

AB + X \rightarrow A + BX

<u>Double replacement</u>: when parts of two ionic compounds are exchanged, making two new compounds.

Ex: FeS + 2HCl
$$\rightarrow$$
 FeCl₂ + H₂S
AB + CD \rightarrow AD + CB

Combustion: burning

$$\begin{array}{ccc} CH_4 + 2O_2 & \rightarrow & CO_2 + 2H_2O \\ C_xH_y + O_2 & \rightarrow & CO_2 + H_2O \end{array}$$

Energy and reactions:

<u>Activation energy</u>: The minimum amount of energy needed to start a chemical reaction.

<u>Catalyst</u>: A material that increases the rate of a reaction by lowering the activation energy.