Synthesis Reactions

Synthesis Reaction: two or more reactants combine to produce a new product. Generally, they have the formula:

A + B → AB

- If you see two separate elements as reactants, it's a synthesis reaction.

Ex. $2\ H_2 + O_2 \rightarrow 2\ H_2O$
Ex. $Na + Cl \rightarrow NaCl$

- Synthesis reactions can also have the combination of small molecules.

Ex. $HCl + NH_3 \rightarrow NH_4Cl$
Ex. $CO_2 + H_2O \rightarrow H_2CO_3$

H_2CO_3 is carbonic acid
Normal rainwater is acidic because of this reaction

Decomposition Reactions

Decomposition Reaction: one compound breads down into two or more simpler compounds or elements. Generally, they have the formula:

AB → A + B

- If one molecule is the only reactant, it's a decomposition reaction.

Ex. $2\ H_2O \rightarrow H_2 + O_2$
Ex. $NH_4NO_3 \rightarrow N_2O + 2\ H_2O$

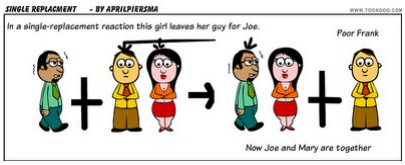
SNC 2P – Chemistry **Types of Chemical Reactions** Name: _____

Single Displacement Reactions

- Involve an element and a compound as reactants
- One element replaces (displaces) another element from a compound.
- Metals will replace other metals, non-metals will replace other non-metals.

AB + Z → A + ZB

Ex. $Mg + 2AgNO_3 \rightarrow Ag + Mg(NO_3)_2$
The silver is replaced by the magnesium!

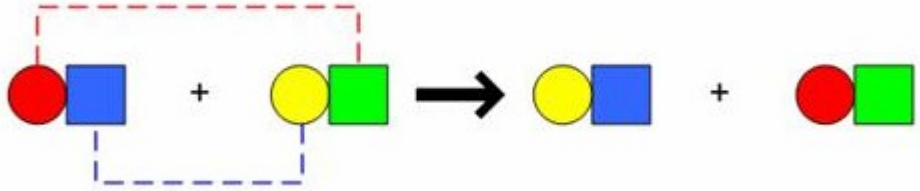


Ex. $Br_2 + CaI_2 \rightarrow I_2 + CaBr_2$
The iodine is replaced by the bromine!

Double Displacement Reactions

- Elements in different compounds can switch places
- Metals will trade places with other metals. Non-metals will exchange places with other non-metals

AB + XY → AY + XB



Ex. $Pb(NO_3)_2 + KI \rightarrow 2\ KNO_3 + PbI_2$
The lead and potassium trade places!

Ex. $2\ FeCl_3 + 3\ Na_2S \rightarrow 6\ NaCl + Fe_2S_3$
The iron and the sodium trade places!