

CHEMICAL REACTIONS

<https://www.youtube.com/watch?v=a7PZDEeqjU>

Chemical Reactions

REACTANT

- This is the starting ingredients in a chemical reaction



These are the reactants



PRODUCT

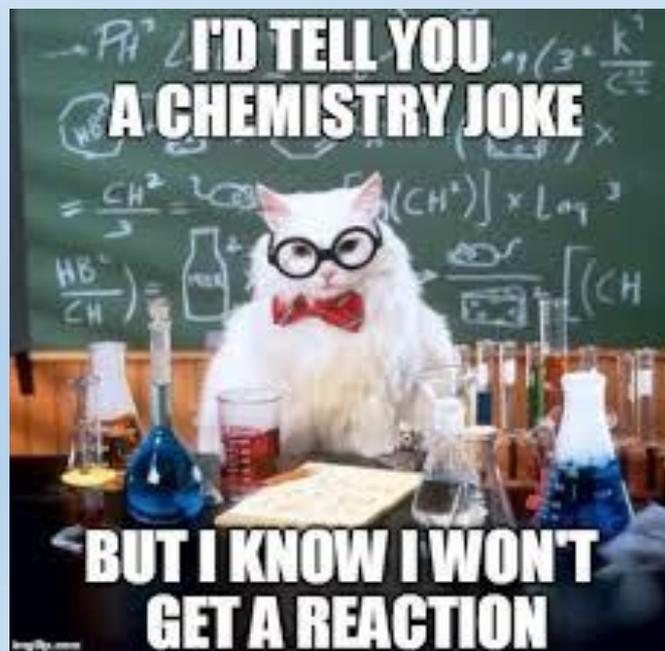
- This is the new substance/s formed in a chemical reaction



These are the products

Law of Conservation of Mass

- The total mass of the reactants will **ALWAYS** equal the total mass of the products in a chemical reaction



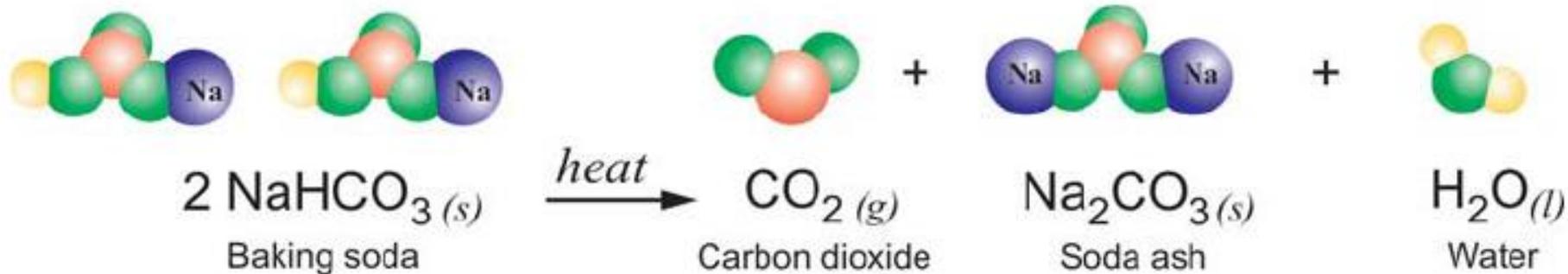
Useful Vocabulary

- Activation energy - energy needed to break chemical bonds in a reactant to start a reaction.
- Endothermic Reaction – A reaction that uses more energy than it releases.
- Exothermic Reaction – A reaction that releases more energy than it uses.
- Which reaction would feel hot and which one would feel cold?

- In an *addition reaction*, two or more substances combine to form a new compound.



- A chemical reaction in which a single compound is broken down to produce two or more smaller compounds is called a *decomposition reaction*.
- Why isn't the following a combustion reaction?



- In a *single-displacement reaction*, one single element replaces a similar element in a compound and the replaced element is now alone.



- In the example below Iron (Fe) is a single element and it takes the place of Copper (Cu). Copper (Cu) is now a single element



- In a *double-displacement reaction*, ions from two compounds in solution exchange places to produce two new compounds.
- One of the compounds formed is usually a precipitate that settles out of the solution, a gas that bubbles out of the solution, or a molecular compound such as water.



- A *combustion reaction*, also called **burning**, occurs when a substance such as wood, natural gas, or propane combines with oxygen and releases a large amount of energy in the form of light and heat.
- In the example above the Carbon compound and O₂ must be exposed to intense energy, usually in the form of a flame (fire) for the reaction to take place



What type of reactions are the following?



ANSWERS

Decomposition

Addition

Single Displacement

Decomposition

Double Displacement

Combustion

The Types of Reactions

Type	General equation	Example
addition	$A + B \rightarrow AB$	$2H_2 + O_2 \rightarrow 2H_2O$
decomposition	$AB \rightarrow A + B$	$2NaHCO_3 \rightarrow H_2 + 2NaCO_3$
single-displacement	$AX + B \rightarrow BX + A$	$Fe + CuCl_2 \rightarrow FeCl_2 + Cu$
double-displacement	$AB + CD \rightarrow AD + CB$	$Pb(NO_3)_2 + 2KI \rightarrow PbI_2 + 2KNO_3$
combustion	carbon compound + $O_2 \rightarrow CO_2 + H_2O$	$C_6H_{12}O_6 + 6O_2 \rightarrow 6CO_2 + 6H_2O$

EXIT SLIP

- What type of reaction occurs when you strike a match?