Chapter 1 - Chemical Reactions and Equations

Chemical change: - is a change in which one or more new substances are formed.
In a chemical change—

- New substances are formed.
- Energy changes are involved.
- There is a change in mass during the reaction.
- Permanent change takes place.

Examples –

- ❖ Cooking of food
- ❖ Rusting of iron
- ❖ Heating of Lead nitrate
- ❖ Souring of milk
- ❖ Ripening of fruit.

Rusting of iron is a chemical change because

- ❖ A new substance iron oxide is formed.
- ❖ The change is permanent; the article has got a rust layer (which may only peal off).
- ❖ There is an increase in mass when rust forms.
- ❖ An energy change has taken place (which may not be visible).

Chemical changes are also known as chemical reactions.

Exothermic Reaction - A chemical reaction which is accompanied by evolution of heat energy is known as exothermic reaction.
Examples:

$C_{(s)} + O_{2(g)} \rightarrow CO_{2(g)} + 393.5kJ$

$N_{2(g)} + 3H_{2(g)} \rightarrow 2NH_{3(g)} + 92.3kJ$

The amount of heat (energy) produced is written along with the products. This indicates that heat is given out.

Endothermic Reactions - A chemical reaction which is accompanied by absorption of heat energy is known as exothermic reaction.
Examples:

$N_{2(g)} + O_{2(g)} + 180.5kJ \rightarrow 2NO_{(g)}$

$2HgO_{(g)} + 180kJ \rightarrow 2Hg_{(l)} + O_{2(g)}$

The amount of heat (energy) produced is written along with the reactants. This indicates that heat is absorbed.