

“ A process which involves chemical change is called a chemical reaction”

Observations that help determine a chemical reaction or characteristics of a chemical reaction:

A chemical reaction can be determined with the help of any of the following observations:

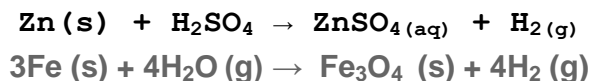
- Evolution of a gas
- Change in temperature
- Formation of a precipitate
- Change in colour
- Change of state

Chemical reaction : Definition:

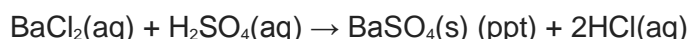
Chemical reactions are chemical changes in which one or more substance(reactants) transform into one or more substance (products) by making or breaking of bonds(or both) between different atoms.

Examples of chemical reactions showing particular characteristics:

- Evolution of a gas:



- Formation of precipitate:** The chemical reaction between sulphuric acid and barium chloride solution is characterised by the formation of a white precipitate of barium sulphate

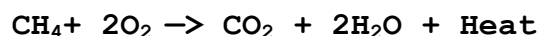


- Change in Temperature:** There are two types of reaction i.e Exothermic and Endothermic Reaction.

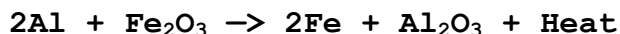
Exothermic Reactions: Those reactions in which energy is released in the form of heat are called **Exothermic Reactions**.

Examples -

- All combustion reactions e.g.



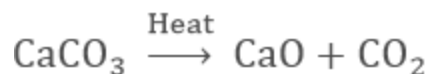
- Thermite reactions e.g.



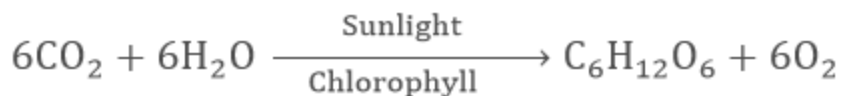
Combinations are generally exothermic in nature. The decomposition of organic matters into compost is an example of exothermic reaction.

Endothermic Reactions: Those reactions in which energy is absorbed are called **Endothermic Reactions**.

Examples -



also, the reaction of photosynthesis -



4. Change in colour: The chemical reaction between sulphur dioxide gas and acidified potassium dichromate solution is characterized by a change in colour from orange to green.
5. **Change in state of substance:** The combustion reaction of candle wax is characterised by a change in state from solid to liquid and gas (because the wax is a solid, water formed by the combustion of wax is a liquid at room temperature whereas, carbon dioxide produced by the combustion of wax is a gas). There are some chemical reactions which can show more than one characteristics.

Chemical Equation

The symbolic representation of chemical reaction using symbols and formulae is known as **Chemical Equation**. For this, reactants are written in left hand side whereas products are written on the right.

Word equation

A word equation is a chemical reaction expressed in words rather than chemical formulas. It helps identify the reactants and products in a chemical reaction.

For example,

Sodium + Chlorine \rightarrow Sodium chloride

The above equation means: "Sodium reacts with chlorine to form sodium chloride."

Symbols of elements and their valencies

A symbol is the chemical code for an element. Each element has one or two-letter atomic symbol, which is the abbreviated form of its name.

Valency is the combining capacity of an element. It can be considered as the number of electrons lost, gain or shared by an atom when it combines with another atom to form a molecule.

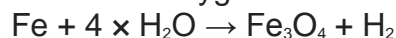
Writing chemical equations

Representation of a chemical reaction in terms of symbols and chemical formulae of the reactants and products is known as a chemical equation.

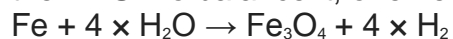
Hydrogen	2	2
Oxygen	1	4

Balance the atom which is maximum in number on either side of a chemical equation. In this equation, the number of oxygen atom is the maximum on the RHS.

To balance the oxygen, one needs to multiply the oxygen on the LHS by 4, so that, the number of oxygen atoms becomes equal on both sides.

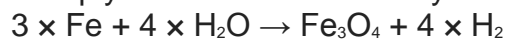


Now, the number of hydrogen atoms becomes 8 on the LHS, which is more than that on the RHS. To balance it, one needs to multiply the hydrogen on the RHS by 4.



After that, the number of oxygen and hydrogen atoms becomes equal on both sides.

The number of iron is one on the LHS, while it is three on the RHS. To balance it, multiply the iron on the LHS by 3.



Now the number of atoms of each element becomes equal on both sides. Thus, this equation becomes a balanced equation.