

8th Standard- Science

Combustion and Flame

Combustible Substances: The substances which burn in the air are called combustible.

Oxygen in the air is essential for combustion.

During the process of combustion, heat and light are given out.

Ignition temperature is the lowest temperature at which a combustible substance catches fire.

Inflammable substances have very low ignition temperature.

Fire can be controlled by removing one or more requirements essential for producing fire.

Water is commonly used to control the fire.

Water cannot be used to control fires involving electrical equipment or oils.

There are various types of combustions such as:

Rapid Combustion: A combustion, that takes place rapidly/high speed, with the production of heat and light is called rapid combustion.

Spontaneous Combustion: A combustion in which a material suddenly bursts into flames, without the application of any apparent cause is called spontaneous combustion.

Explosion: The process of combustion in which a large number of gases are evolved with the production of a tremendous amount of heat, light and sound is called an explosion.

There are three different zones of a flame:

- **Dark Zone:** It contains vapours of fuel and unburnt carbon particles.
- **Luminous Zone of Flame:** The middle zone of partial combustion that is yellow in colour and produces light, is called the luminous zone of flame.
- **Non-luminous Zone of Flame:** It is the outer zone of flame, that is faintly blue in colour and undergoes complete combustion of the substance.

Fuel is a substance, which may be burnt to produce considerable heat without the formation of undesirable products.

Ideal Fuel: The fuel, which fulfils all the requirements for a particular use is called an ideal fuel.

The amount of heat energy produced on complete combustion of 1 kg of a fuel is called its calorific value. It is expressed in a unit called kilojoule per kg (kJ/kg). Unburnt Carbon particles in the air are dangerous pollutants causing respiratory problems. Incomplete combustion of fuel gives poisonous carbon monoxide gas.

Increased percentage of carbon dioxide gas in air is responsible for global warming. Oxides of sulphur and nitrogen produced by the burning of coal, diesel and petrol cause acid rain which is harmful for crops, buildings and soil.

Structure of a flame: A flame has three zones, the outermost thin transparent faint bluish non-luminous region of complete combustion, the middle bright luminous zone of partial combustion, while the innermost is the coldest dark zone, which consists of hot vapours.

Acid Rain: When the pollutants like sulphur dioxide and nitrogen oxides dissolve in rainwater, it forms an acid. The rain of that acid is called acid rain.

Calorific Value: The amount of heat energy produced on complete combustion of 1 kg of a fuel is called its calorific value. It is expressed in a unit called kilojoule per kg (kJ/kg).

Combustion: A chemical process in which a substance reacts with oxygen to give off heat is called combustion.

Deforestation: It is the process of cutting of trees on a large scale.

Explosion: The process of combustion in which a large number of gases are evolved with the production of a tremendous amount of heat, light and sound, is called an explosion.

The flame is produced when the combustible substance vapourises during burning.

Fire Extinguisher: Fire extinguisher is used to control the fire. The job of a fire extinguisher is to cut off the supply of air or to bring down the temperature of the fuel, or both.

Fuels: A fuel is a substance, which may be burnt to produce considerable heat without the formation of undesirable products.

Fuel Efficiency: Fuel efficiency is expressed in terms of its calorific value which is the amount of heat energy produced on complete combustion of 1 kg of fuel.

Global Warming: It is the rise in temperature of the atmosphere of the earth due to the combustion of fuels.

Ideal Fuel: The fuel, which fulfils all the requirement for a particular use is called an ideal fuel.

Ignition Temperature: The lowest temperature at which a substance catches fire is called its ignition temperature.

Inflammable Substance: The substances, which have very low ignition temperature and can easily catch fire with a flame are called Inflammable substances.