Combustion and Flame

- **Combustion**

- It is a chemical process in which a substance reacts with oxygen to give off heat and light.
- Oxygen (in air) is essential for combustion.
- Substances that burn in air are called combustible substances (also called **fuels**) and those that do not burn in air are non-combustible substances.

- **Ignition temperature**
- It is the lowest temperature at which a substance catches fire.

- **Inflammable substances**
- They have very low ignition temperature and can easily catch fire with flame.

- **Supporter of combustion**

- The gaseous environment that supports combustion of a combustible substance is called supporter of combustion**.**

- Smaller the size of combustible particles, faster is the rate of combustion.

- Nature of combustible substances: Inflammable substances burn faster as compared to substances such as wood.

- **Control of fire:**

- Water is commonly used to extinguish fire. It is not suitable for fires involving oil, petrol, and electrical equipments.

- For fires involving oil, petrol, and electrical equipments, carbon dioxide is the best extinguisher or Soda-acid fire extinguisher.

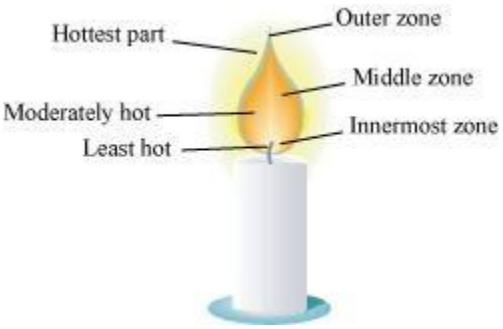
- **Types of combustion:**
- **Rapid combustion**:

- The combustion in which substances burn rapidly to produce heat and light.
- In rapid combustion, external heat must be supplied.

- **Spontaneous combustion**:
- The combustion in which substances suddenly burst into flames, without the application of any apparent cause.

- **Explosion:**
  - The combustion in which sudden reactions take place on ignition of some substances to produce heat, light, and sound.

- **Zones of candle flame**
  - Dark zone (middle zone), luminous zone (innermost zone), and non-luminous zone (outer zone).



- **A good fuel is one which**

  - is cheap
  - is readily available
  - burns easily in air at a moderate rate
  - produces large amount of heat
  - does not leave behind any undesirable substances

- **Fuel efficiency:** It is expressed in terms of calorific value. The unit is kilojoule per kg.

- **Calorific value:**
  - It is the amount of heat energy produced by complete combustion of 1 kg of a fuel.
  - It is expressed in Kilojoule per kg (kJ/kg).