COMBUSTION & FLAME

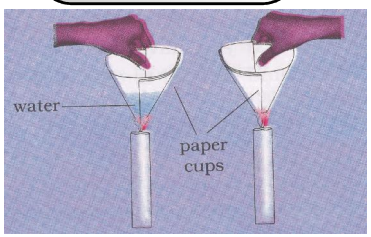
Fuel

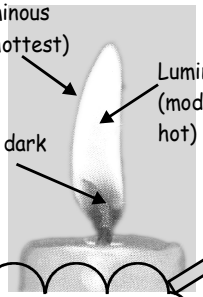
Characteristic of ideal fuel
- Less residue burns smoothly
- Proper ignition temperature
- High calorific value
- Less pollution
- Not more valuable for the other purpose

Types
- Solid
  - Wood
  - Coal
- Liquid
  - Diesel
  - Petrol
- Gases
  - Hydrogen
    - No resisdue $H_2 + O_2 \rightarrow 2H_2O$ + Heat
    - Low ignition temperature and costlier
    - Highest calorific value (150 kJ/g)
  - LPG
    - $CH_4 + C_2H_6 + C_3H_8$
    - Colourless, odourless and inflammable gas
    - Calorific value 50 kJ/g
  - CNG
    - No resisdue and clean fuel
    - $CH_4 + O_2 \rightarrow CO_2 + H_2O$ + heat
    - Low ignition temperature and cheaper
    - Calorific value 55 kJ/g

Types
- Slow
- Rapid
- Spontaneous
- Complete
- Incomplete

Conditions required
- Combustible substance
- Supporter O_2
- Attainment of ignition temperature





Luminous
- Yellow
- More light
- Black soot
- Unsufficient oxygen

Non Luminous
- Blue
- Less light
- No residue
- Excess of oxygen

Products and their effects
- Unburnt carbon causes respiratory diseases
- CO causes suffocation, etc
- SO_2, NO_2 causes acid rain
- CO_2 causes global warming