

Different sources of energy

Fuels

Fuels are substances that release plenty of heat energy on burning.

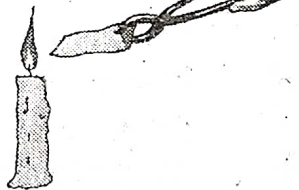
On the basis of states of matter fuels may be classified as solid, liquid and gas.

| Solid | Liquid | Gas |
|---|---|---|
| <ul style="list-style-type: none"> • Firewood • Coal • Coconut shell • Cowdung cake | <ul style="list-style-type: none"> • Kerosene • Diesel • Petrol • Alcohol | <ul style="list-style-type: none"> • Biogas • Petroleum gas • Natural gas • Hydrogen • Methane |

EXPERIMENT

Take three papers of the same size. Keep one stretched. Crumble the next.

Make the third paper wet using water. Burn each of them over a candle flame using pincers. Compare the burning of each.



| Stretched paper | Crumbled paper | Wet paper |
|---|---|---|
| <ul style="list-style-type: none"> • Less smoke • Quick burning • Carbon is less • Burns completely | <ul style="list-style-type: none"> • A lot of smoke • Slow burning • Carbon is formed • A small portion remain unburned | <ul style="list-style-type: none"> • Smoke is formed • No combustion • Carbon is more • More parts remain unburned. • Wet paper takes more time to reach the ignition temperature. |

Complete combustion

It is a reaction in which fuels react intensively with oxygen, producing carbon dioxide, steam, heat and light.

Partial combustion

If oxygen is not sufficient, large quantities of carbon monoxide, soot and a little amount of carbon dioxide will be formed. This type of burning is partial combustion.

• What are the features of complete combustion?

- Carbon monoxide is not formed.
- More heat is generated.

Conditions favourable for the complete combustion

- Solid fuels must be dry.
- Should reach the ignition temperature.
- Availability of oxygen should be high.
- The surface area of fuels which comes in contact with oxygen should be large.

Reasons of partial combustion

- Fuel is not dry
- Insufficient oxygen
- Less surface area of fuels which comes in contact with oxygen.

Drawbacks of partial combustion

- Fuel wastage
- Energy wastage
- Time wastage
- Atmospheric pollution
- **What are the advantages of using smokeless choolahs at home?**
No wastage of energy. Low quantity of fuel is needed. No atmospheric pollution, time gain, fuel expense is reduced.
- **Haven't you seen pollution testing centres? Why is the test done on vehicles?**
It is to find whether excess CO_2 , oxides of nitrogen, steam, CO etc. are present in the exhaust gas of vehicles than the permitted limits.