

## Chemical energetics (6)

→ A fuel is a substance which can be conveniently used as a source of energy

→ Perfect fuel - Cheap

available in large quantities

safe to store and transport

easy to ignite, burn, no pollution

capable of releasing large amounts of energy

→ fossil fuels - combustion - non renewable

→ nuclear power - fission - radioactive waste

→ Renewable energy - Hydroelectric power

- Biomass and biogas

→ Hydrogen - burns cleanly to form water - costly

→ complete combustion -  $\text{CO}_2$  is formed

→ Incomplete combustion -  $2\text{CO}$  is formed.

→  $\Delta H$  - change in enthalpy

→  $\Delta H$  negative - exothermic

→  $\Delta H$  positive - endothermic

→ The energy required to start a reaction - activation energy

→ Hydrogen fuel cell:  $\text{O}_2 + \text{H}_2\text{O} + 4\text{e}^- \rightarrow 4\text{OH}^-$

