

Energy Changes

Exothermic Reactions:

In exothermic reactions thermal energy is transferred to the surroundings so the temperature of the surroundings increases

Examples:

Condensation

Freezing

Dissolving anhydrous salts(eg Add water in anhydrous Copper sulfate)

Make acids and alkali dilute by the addition of water

Combustion/Burning (must carry oxygen as one of the reactant)

Corrosion of metals like rusting

Neutralisation reactions

Respiration

Endothermic Reactions

In endothermic reactions thermal energy is taken in from the surroundings so the temperature of the surroundings decreases

Examples:

Evaporation

Melting

Boiling

Dissolving of some ionic compounds in water like ammonium chloride.

Photosynthesis

Thermal decomposition eg thermal decomposition of CaCO_3 .

Enthalpy Change ΔH :

The enthalpy change represents the difference in energy content of the reactants and products.

Activation energy (E_a):

Activation energy (E_a), which is the minimum energy that colliding particles must have in order to react.s

For every reaction bonds need to break on reactant side(left hand side) so that needs absorption of energy so breaking of bonds is endothermic.

Mnemonic:BENDO (Breaking of bonds is endothermic)

For every reaction making of bonds that is right hand side of the reaction is exothermic which releases heat energy.

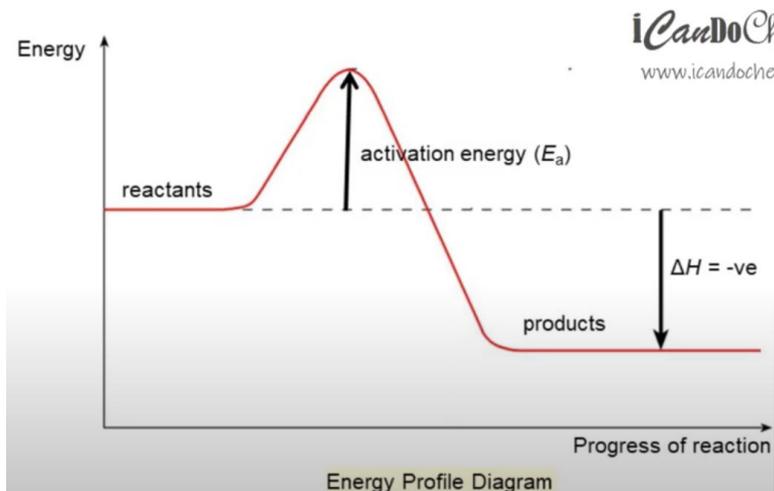
Mnemonic is MEXO(making of bonds is exothermic)

If in breaking of bonds absorbs more heat than release by making of bond heat energy change will be + or ΔH will be +.

If making of bond releases more energy than absorb in breaking of bonds ΔH will be - negative.

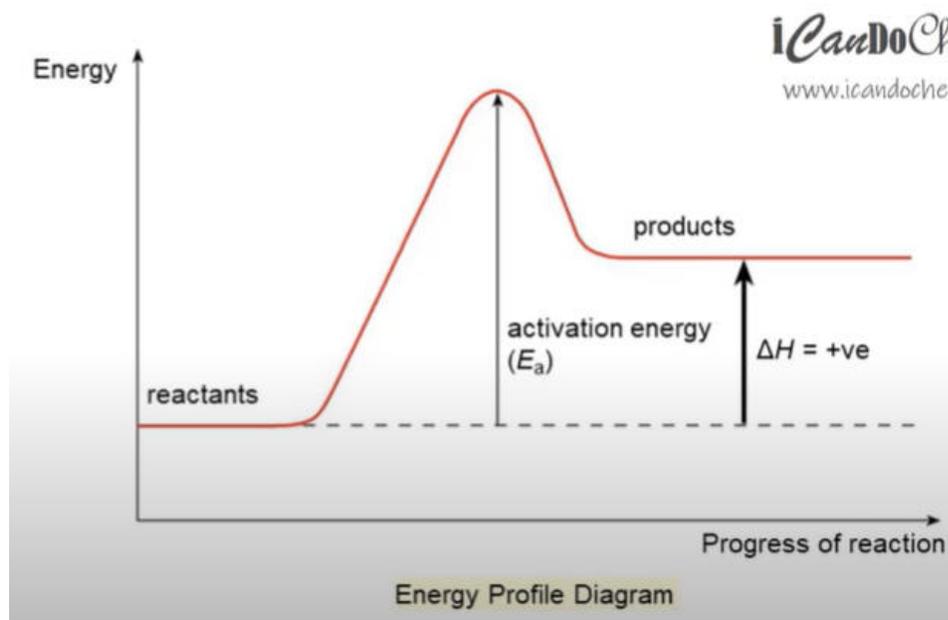
Exothermic in terms of bond breaking and making:

Bond breaking absorbs energy so endothermic. Bond making release energy so exothermic. More energy is released than absorbs in a chemical reaction so it is exothermic.



Endothermic in terms of bond breaking and making

Bond breaking absorbs energy so endothermic. Bond making release energy so exothermic. More energy is absorbed than released in a chemical reaction so it is endothermic.



Exothermic reactions	Endothermic reactions
Energy is given out to the surroundings	Energy is taken in from the surroundings
ΔH is negative	ΔH is positive
Products have less energy than reactants	Products have more energy than reactants