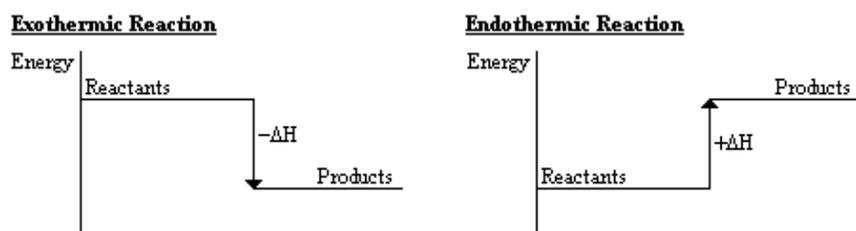


Chemistry Revision Notes – Rates Of Reaction

- The **rate of reaction** can be increased by:
 - Increasing the **surface area**.
 - Increasing the **temperature**.
 - Increasing the **concentration** of the reactants.
 - Using a **catalyst**.
- A **catalyst** lowers the **activation energy** of a reaction by providing a surface for particles to react on. A catalyst can also slow down reactions.
- An **endothermic** reaction cools down (it takes in heat from the surroundings).
- An **exothermic** reaction heats up (it gives out heat to the surroundings).
- The most common example of an exothermic reaction is **combustion**.
- Collision theory** defines the rate of a reaction – the more that the reactants bump into each other, the more likely they are to react.
- Energy bond diagrams:**



- The **enthalpy** of an exothermic reaction is expressed by $-\Delta H$.
- The enthalpy of an endothermic reaction is expressed by $+\Delta H$.
- Energy is needed to break covalent bonds, i.e. **breaking bonds is endothermic**.
- Energy is released when new covalent bonds are made, i.e. **making bonds is exothermic**.
- In an exothermic reaction, the energy of the products is less than the energy of the reactants.
- In an endothermic reaction, the energy of products is greater than the energy of the reactants.
- Reversible reactions** are expressed in the form $A + B \rightleftharpoons C + D$, whereby the top arrow represents the **forward reaction**, and the bottom arrow represents the **backward reaction**.
- In **equilibrium**, the forward reaction matches the backward reaction.
- Equilibrium can be moved to the right or the left by:
 - Changing the **concentration** – this favours the forward reaction if the reactants are increased in concentration, and the backward reaction if the products are increased in concentration).
 - Changing the **temperature** – this favours the endothermic reaction if increased, and the exothermic reaction if decreased.
 - Changing the **pressure** – this favours the reaction that produces less volume if increased, and the reaction that produces more volume if decreased.
- Adding a **catalyst** has no effect on the position of the equilibrium, but it allows equilibrium to be reached more quickly.