

Free energy, reaction kinetics and enzymes – Reference Summary

Free Energy (ΔG)

$$\Delta G = \Delta H - T\Delta S$$

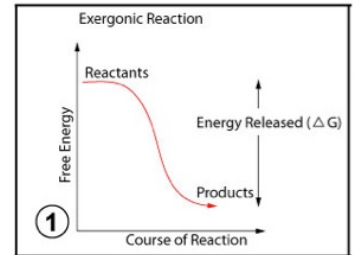
H = Enthalpy

S = Entropy

T = Temperature

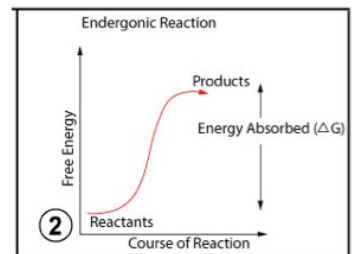
Exergonic Reactions

Exergonic reactions release energy, so that $\Delta G < 0$ and the reaction is thermodynamically spontaneous.



Endergonic Reactions

Endergonic reactions require energy to proceed, so that $\Delta G > 0$ and the reaction is non-spontaneous.



Equilibrium

If $\Delta G = 0$, the reaction is at equilibrium such that the rate of the forward reaction = the rate of the backwards reaction.

Enzymes

- Enzymes are biological catalysts (mostly proteins) that lower the activation energy (E_a) of a chemical reaction, thus speeding it up
- Enzymes are specific and each enzyme catalyzes a specific reaction
- ENZYMES DO NOT CHANGE THE ΔG OF A REACTION BUT JUST SPEED UP THE REACTION RATE