Gibbs Free Energy

Gibbs Free Energy is a thermodynamic potential that measures the amount of work obtainable from a defined system. It is often used to determine whether a reaction is spontaneous as written or spontaneous in reverse. The equation is ΔG = ΔH - TΔS, where H is enthalpy, S is entropy, and G is Gibbs free energy. If ΔG is negative, the reaction is spontaneous as written. If ΔG is positive, the reaction is nonspontaneous as written but spontaneous in reverse. If ΔG is zero, the reaction is at equilibrium, and there is no net change in concentrations of products or reactants.

PLAY PICMONIC

ΔG = ΔH-TΔS

Delta-G-Goblin EQUALS Delta-H-Horse SUB-tract T-Thermometer Delta-S-Snake

The equation often seen for Gibbs Free energy is ΔG = ΔH-TΔS. ΔG is the Free Energy of the Reaction, ΔH is the enthalpy of the reaction, T is temperature, and ΔS is the entropy of the reaction.

If ΔG is Negative, the reaction is Spontaneous

Delta-G-Goblin Devil with Spartan Reaction

If the change in Gibbs free energy is negative, the reaction is spontaneous. This means that it's energetically favorable for the reaction to proceed as written, but does not reflect on the kinetics of the reaction.

If ΔG is 0, the reaction is at Equilibrium

Delta-G-Goblin EQUALS Zorro at Equal-Leprochan

If the change in Gibbs free energy is zero, it means the reaction is currently in equilibrium, meaning the concentrations of reactants and products do not change over time.

If ΔG is Positive, the reaction is Nonspontaneous

Delta-G-Goblin Angel with Nun-Spartan Reaction

If the change in Gibbs free energy is positive, the reaction is nonspontaneous. This means that it's not energetically favorable for the reaction to proceed as written, but does not reflect on the kinetics of the reaction. In most cases it indicates that the reverse reaction is spontaneous.