

LECTURE 18 THERMODYNAMICS AND SPONTANEOUS CHANGE

I. Thermodynamics and Spontaneous Change

A. Entropy ΔS° for Reactions

1. 3rd Law of Thermodynamics
2. Internal degrees of freedom of reactants

B. Gibbs free energy ΔG°

II. Free Energy of Formation ΔG_f°

- A. Thermodynamic stability
- B. Calculating ΔG° for a reaction

III. Second Law of Thermodynamics

- A. Controlling spontaneity with temperature
- B. ΔG at any pressure (ideal gases)
- C. ΔG at any concentration (ideal solutions)

IV. Chemical Equilibrium

- A. Thermodynamic equilibrium constant
- B. Reaction quotient and direction of change