

CHEM 336 TOPICS

1. NON-IONIC SOLUTIONS

1.1 Some notions on the liquid properties

1.2. The simple mixtures

1.2.1 The thermodynamic description of mixtures

1.2.2 The Partial molar quantities

a) Partial molar volume V_p

b) Partial molar Gibbs energies

c) The wider significance of the chemical potential

d) The Gibbs Duhem equation

1.3 The Chemical potential of liquids

1.3.1 Ideal solutions

1.3.2 Ideal-dilute solutions

1.4 Ideal and non-ideal solutions of non-electrolyte

1.4.1 Ideal solutions

1.4.2 Excess functions and regular solutions

1.5 Colligative properties

1.5.1 The common features of colligative properties

1.5.2 The elevation of boiling point

1.5.3 The depression of freezing point

1.5.4 The solubility

1.5.5 The Osmosis

1.6 Activities of solvent and solute

1.6.1 Ideal-dilute solutions

1.6.2 Real solutes

1.6.3 Activities in terms of molalities

1.6.4 The biological standard state

1.7 Activities coefficient

1.7.1 The activities of regular solutions

1.7.2 Mean activity coefficients

2. IONIC SOLUTIONS

2.1 The thermodynamic properties of ions in solution

2.1.1 Thermodynamic functions of formation

2.1.2 Ion activities

2.1.3 The activities of ions in solution

2.2 The Born and Debye-Huckel Models

2.3 Solubility and dissociation

2.4 Electrolytic conductance

2.5 Ionic mobility

2.6 Transport number

3. PHASES DIAGRAMS OF BINARY SYSTEMS

3.1 Vapor pressure diagrams

3.1.1 The composition of the vapor

3.1.2 The interpretation of the diagrams

3.1.3 The level rule

3.2 Liquid-vapor phase diagrams

3.2.1 The distillation of mixtures

3.2.2 Azeotropes

3.2.3 Immiscible liquids

3.3 Liquid-liquid phase diagrams

3.3.1 Phase separation

3.3.2 Critical solution temperatures

3.3.3 The distillation of partially miscible liquids

3.4 Liquid-solid phase diagrams

3.4.1 Eutectics

3.4.2 Reacting systems

3.4.3 Incongruent melting