Chemical Equilibrium

Ex 1. For the equilibrium: $H_{2(g)} + I_{2(g)} \rightleftharpoons 2HI_{(g)}$

the equilibrium constant Ke is 50.5 at 448°C.

If [H₂]₀ = [I₂]₀ = 1 mol.L.1, what will the concentration of H₂, I₂ and HI be at equilibrium.

Ex 2. Consider the following reversible reaction:

$$PCl_{S(g)} \Longrightarrow PCl_{S(g)} + Cl_{S(g)}$$

One mole of PCl₃ is placed in a flask of capacity 4 liter to be dissociated at constant temperature T, the number of moles of Cl₂ formed at equilibrium is 0.25mole.

Calculate the equilibrium constant of the above system at temperature T.

Ex 3. At 100°C, the equilibrium constant for the reaction system,

$$COCl_{2(g)} \Longrightarrow CO_{(g)} + Cl_{2(g)}$$

is $K_e = 2.19 \times 10^{-10}$

 Determine whether the following mixture of components of the above system is at equilibrium;

$$[COCl_2] = 3.5 \times 10^{-3} \text{ mol.L}^{-1}$$

$$[CO] = 1.2 \times 10^{-5} \text{ mol.L}^{-1}$$

$$[Cl_2] = 3.3 \times 10^{-6} \text{ mod.L}^{-1}$$

- 2. If it is not at equilibrium, in what direction the system proceeds to reach equilibrium?
- Ex 4. In a closed container of volume V and at constant temperature T = 300K, we introduce 2 mol of NO and 1 mol of O₂ gases, the following equilibrium is established:

$$2NO_{(g)} + O_{2(g)} \Longrightarrow 2NO_{2(g)}$$

Calculate the degree of conversion (α) of NO if the amount of NO₂ at equilibrium is three time that of O₂.

Ex 5. Ethanamine C₂H₃NH₂ gas is put in an empty flask of volume V= 2L, maintained at constant temperature T = 500K.

The following equilibrium is established:

$$C_2H_4NH_{2(g)} \iff C_2H_{4(g)} + NH_{3(g)}$$

The initial amount of ethanamine is 0.2 mol and the total amount of the mixture at equilibrium is 0.3 mol.

- Calculate the degree of dissociation α of ethanamine.
- 2. Calculate the equilibrium constant Kc at 500K.

Chemical Equilibrium Problems With Solutions

Iris Wai-yin Shiu

Chemical Equilibrium Problems With Solutions:

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methods of calculation and display are used extensively because of their value in clarifying equilibria and in leading one quickly to valid numerical approximations The coverage of solution equilibrium phenomena is not however exhaustively comprehensive Rather I have chosen to offer funda mental and rigorous examinations of homogeneous step equilibria and their interactions with solubility and redox equilibria Many examples are worked out in detail to demonstrate the use of equi Solving Equilibrium Problems with Applications to librium calculations and diagrams in various fields of investigation Qualitative Analysis Steven S. Zumdahl, 1989 Element Variables and the Solution of Complex Chemical Equilibrium Problems Keith Meintjes, Alexander P. Morgan, 1987 **Principles and Applications of Aquatic Chemistry** François M. M. Morel, Janet G. Hering, 1993-03-10 Presents aquatic chemistry in a way that is truly useful to those with diverse backgrounds in the sciences Major improvements to this edition include a complete rewrite of the first three background chapters making them user friendly There is less emphasis on mathematics and concepts are illustrated with actual examples Equilibrium Calculations John T. Donoghue, 1971 to facilitate understanding Tearing Versus Simultaneous Solution in Solving Chemical Equilibrium Problems Iris Wai-yin Shiu,1980 Exploring Chemical Analysis Daniel C. Harris, 2005 Exploring Chemical Analysis teaches students how to understand analytical results and how to use quantitative manipulations preparing them for the problems they will encounter **Surface Complexation Modeling** David A. Dzombak, François M. M. Morel, 1991-01-16 Provides a description of the thermodynamic model data treatment procedures and the thermodynamic constants for hydrous ferric oxide Includes detailed coverage of the model and the parameter extraction procedure A Numerical Algorithm for the Solution of Chemical Equilibrium Problems Thomas Wayne Wall,1984 Ouantitative Chemical Analysis Mr. Rohit Manglik, 2024-07-11 EduGorilla Publication is a trusted name in the education sector committed to empowering learners with high quality study materials and resources Specializing in competitive exams and academic support EduGorilla provides comprehensive and well structured content tailored to meet Chemical Equilibrium Allen J. Bard,1966 the needs of students across various streams and levels A Problem-Solving Approach to Aquatic Chemistry James N. Jensen, 2022-12-20 A Problem Solving Approach to Aquatic Chemistry Enables civil and environmental engineers to understand the theory and application of aquatic equilibrium chemistry. The second edition of A Problem Solving Approach to Aquatic Chemistry provides a detailed introduction to aquatic equilibrium chemistry calculation methods for systems at equilibrium applications of aquatic chemistry and chemical kinetics. The text directly addresses two required ABET program outcomes in environmental engineering chemistry including stoichiometry equilibrium and kinetics and material and energy balances fate and transport of substances in and between air water and soil phases The book is very student centered with each chapter beginning with an introduction and ending with a summary that reviews the chapter's main points To aid in reader comprehension important terms are defined in context and key ideas are summarized Many thought provoking discussion questions worked examples and end of chapter problems are also included

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Thermodynamics and Chemistry, by F. H. MacDougall Frank Henry Macdougall,1921 Journal of the American Chemical Society American Chemical Society,1914 Proceedings of the Society are included in v 1 59 1879 1937 General Catalogue Massachusetts Institute of Technology,1928 Programme of the Courses of Instruction Massachusetts Institute of Technology,1909

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