Lesson 2 - Homework

8. How can you identify an ACID by looking at its formula?

Acids BEGIN with "H."

9. How can you identify a BASE by looking at its formula, except for NH_3 (ammonia)?

Bases END with "OH."

10. List the 6 strong acids.

Formula	HCl	HBr	HI	$HClO_4$	H_2SO_4	HNO_3
Name	hydrochloric acid	hydrobromic acid	hydroiodic acid	perchloric acid	sulfuric acid	nitric acid

11. Complete the sentence: Strong Bases contain a cation from an element in group # __1__ or __2__ AND an anion called __hydroxide__ with the symbol __OH^-__

12. What is another term for "precipitation" reaction? double displacement (more commonly)

13. Define precipitate. a solid that forms during a reaction and doesn't dissolve in water

14. Aqueous solutions contain ions that are present in solution before and after a reaction. What are they called?

15. Predict the products of each reaction. Write a net ionic equation. Tell whether a reaction is likely to occur. (Use a solubility chart when necessary). Finally, balance the net ionic equation.

a) $HI(aq) + Zn(NO_3)_2(aq) \rightarrow$ $HNO_{3(aq)} + ZnI_{2(aq)}$ Because all chemicals are aqueous and there are no weak electrolytes, this reaction will have NO NET ionic equation. (All ions will separate and can be cancelled in the equation). This means NO REACTION occurs.

b) $CaSO_4(aq) + Na_2CO_3(aq) \rightarrow$ $Na_2SO_{4(aq)} + CaCO_{3(s)}$ Net Ionic Equation: $Ca^{2+} + CO_3^{2-} \rightarrow CaCO_3$ This reaction is likely to occur because there is a net ionic equation.

c) $H_3PO_4(aq) + AlCl_3(aq) \rightarrow$ $AlPO_{4(s)} + HCl_{(aq)}$ Net Ionic Equation: $Al^{3+} + PO_4^{3-} \rightarrow AlPO_4$ This reaction is likely to occur because there is a net ionic equation.

16. Balance the equation for the following precipitation reaction, and then write the net ionic equation. Indicate the state of the species (s, l, aq, or g).

$CdCl_2 + 2NaOH \rightarrow Cd(OH)_2 + 2NaCl$ Net Ionic Equation: $Cd^{2+}_{(aq)} + 2OH^-_{(aq)} \rightarrow Cd(OH)_{2(s)}$

$Cd^{2+}_{(aq)} + 2Cl^-_{(aq)} + 2Na^+_{(aq)} + 2OH^-_{(aq)} \rightarrow Cd(OH)_{2(s)} + 2Na^+_{(aq)} + 2Cl^-_{(aq)}$

17. Oxalic acid, $H_2C_2O_4$, which is found in certain plants, can provide two hydrogen ions in water. Write one balanced equation showing the acid losing its first hydrogen ion. Then, write a second equation showing the leftover of the oxalic acid losing its second hydrogen ion.

$H_2C_2O_4 \rightarrow H^+ + HC_2O_4^-$

$HC_2O_4^- \rightarrow H^+ + C_2O_4^{2-}$

Water And Aqueous Systems Chemistry Answer Key

Peter Atkins,Loretta Jones

Water And Aqueous Systems Chemistry Answer Key:

The Physical Chemistry of Aqueous Systems Robert Kay,2012-12-06 Conformation and Hydration of Sugars and Related Compounds in Dilute Aqueous Solution Studies of Hydrophobic Bonding in Aqueous Alcohols Enthalpy Measurements and Model Calculations Structure in Aqueous Solutions of Nonpolar Solutes from the Standpoint of Scaled Particle Theory Raman Spectra from Partially Deuterated Water and Ice VI to 10 1 kbar at 28 C Solvation Equilibria in Very Concentrated Electrolyte Solutions Ionic Association in Hydrogen Bonding Solvents The Role of Solvent Structure in Ligand Substitution and Solvent Exchange at Some Divalent Transition Metal Cations N *Aqueous Systems at Elevated Temperatures and Pressures* Roberto Fernandez-Prini,A.H. Harvey,D.A. Palmer,2004-07-06 The International Association for the Properties of Water and Steam IAPWS has produced this book in order to provide an accessible up to date overview of important aspects of the physical chemistry of aqueous systems at high temperatures and pressures These systems are central to many areas of scientific study and industrial application including electric power generation industrial steam systems hydrothermal processing of materials geochemistry and environmental applications The authors goal is to present the material at a level that serves both the graduate student seeking to learn the state of the art and also the industrial engineer or chemist seeking to develop additional expertise or to find the data needed to solve a specific problem The wide range of people for whom this topic is important provides a challenge Advanced work in this area is distributed among physical chemists chemical engineers geochemists and other specialists who may not be aware of parallel work by those outside their own specialty The particular aspects of high temperature aqueous physical chemistry of interest to one industry may be irrelevant to another yet another industry might need the same basic information but in a very different form To serve all these constituencies the book includes several chapters that cover the foundational thermophysical properties such as gas solubility phase behavior thermodynamic properties of solutes and transport properties that are of interest across numerous applications The presentation of these topics is intended to be accessible to readers from a variety of backgrounds Other chapters address fundamental areas of more specialized interest such as critical phenomena and molecular level solution structure Several chapters are more application oriented addressing areas such as power cycle chemistry and hydrothermal synthesis As befits the variety of interests addressed some chapters provide more theoretical guidance while others such as those on acid base equilibria and the solubilities of metal oxides and hydroxides emphasize experimental techniques and data analysis Covers both the theory and applications of all Hydrothermal solutions Provides an accessible up to date overview of important aspects of the physical chemistry of aqueous systems at high temperatures and pressures The presentation of the book is understandable to readers from a variety of backgrounds **GATE Notes - Geology and Geophysics** Mocktime Publication, GATE Notes Geology and Geophysics Gate Exam Pattern Gate syllabus Gate Previous Papers Gate Questions *Hydrogen-Bonded Liquids* J.C. Dore,José Teixeira,2012-12-06 The study of liquids covers a wide

range of scientific disciplines primarily in physics and chemistry As a result of this disparate activity the links between new developments in remote fields are seldom co ordinated into a single conference The objective of the present meeting was to gather together people with different forms of expertise Previous ASI meetings on the liquid state have been held over an extended period and have occurred on a three yearly basis The first meeting in this series was on Structure and Dynamics of Liquids in 1980 and was held on the island of Corsica The next meeting on Molecular liquids Dynamics and Interactions was held in Florence in 1983 and was followed by Aqueous Solutions at the Institut d Etudes Scientifiques de Cargese in 1986 It therefore seemed a natural choice to select Cargese for the next meeting in 1989 and to choose a topic which emphasised a particular area of liquid state studies Due to our own involvement in collaborative research we considered that Hydrogen bonded liquids would be an appropriate topic One of its attractions was that there was much new material coming from widely disparate investigations and it would be a convenient time to draw together the different strands The particular interest in water was clearly central to this topic but it was thought desirable to set this development in the wider context of other systems in which hydrogen bonding plays a significant role **CRC Handbook of Chemistry and Physics, 85th Edition** David R. Lide,2004-06-29 Get a FREE first edition facsimile with each copy of the 85th Researchers around the world depend upon having access to authoritative up to date data And for more than 90 years they have relied on the CRC Handbook of Chemistry and Physics for that data This year is no exception New tables extensive updates and added sections mean the Handbook has again set a new standard for reliability utility and thoroughness This edition features a Foreword by world renowned neurologist and author Oliver Sacks a free facsimile of the 1913 first edition of the Handbook and thumb tabs that make it easier to locate particular data New tables in this edition include Index of Refraction of Inorganic Crystals Upper and Lower Azeotropic Data for Binary Mixtures Critical Solution Temperatures of Polymer Solutions Density of Solvents as a Function of Temperature By popular request several tables omitted from recent editions are back including Coefficients of Frictionand Miscibility of Organic Solvents Ten other sections have been substantially revised with some such as the Table of the Isotopes and Thermal Conductivity of Liquids significantly expanded The Fundamental Physical Constants section has been updated with the latest CODATA NIST values and the Mathematical Tables appendix now features several new sections covering topics that include orthogonal polynomials Clebsch Gordan coefficients and statistics **Scientific and Technical Aerospace Reports** ,1968 Nuclear Science Abstracts ,1969 Publications of the National Bureau of Standards 1977 Catalog United States. National Bureau of Standards,1978 *A Problem-Solving Approach to Aquatic Chemistry* James N. Jensen,2023-01-05 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 Each part of the text begins with a case study a portion of which is addressed in each subsequent chapter illustrating the principles of that chapter In addition each chapter has an Historical Note exploring connections with the people and cultures connected to topics in the text A Problem Solving Approach to Aquatic Chemistry includes Fundamental concepts such as concentration units thermodynamic basis of equilibrium and manipulating equilibria Solutions of chemical equilibrium problems including setting up the problems and algebraic graphical and computer solution techniques Acid base equilibria including the concepts of acids and bases titrations and alkalinity and acidity Complexation including metals ligands equilibrium calculations with complexes and applications of complexation chemistry Oxidation reduction equilibria including equilibrium calculations graphical approaches and applications Gas liquid and solid liquid equilibrium with expanded coverage of the effects of global climate change Other topics including chemical kinetics of aquatic systems surface chemistry and integrative case studies For advanced senior undergraduates and first year graduate students in environmental engineering courses A Problem Solving Approach to Aquatic Chemistry serves as an invaluable learning resource on the topic with a variety of helpful learning elements included throughout to ensure information retention and the ability to apply covered concepts in practical settings **Modern Approaches to Wettability** G.I. Loeb,M.E. Schrader,2013-06-29 Striking a balance between applied and theoretical research this work details many of the uses of wettability and interprets experimental data from a variety of viewpoints including the separation of forces and the equation of state approaches **Selected Water Resources Abstracts** ,1990 *Amorphous Food and Pharmaceutical Systems* Harry Levine,2007-10-31 During the past decade the importance of amorphous water soluble substances has been increasingly recognised within the food and pharmaceutical industries In response Amorphous Food and Pharmaceutical Systems brings together current leading experts to contribute to this unique cross disciplinary account of the subject Coverage includes water compatible amorphous solids physical chemical behaviour low water content systems water as plasticizer applications in food and pharmaceutical sciences and industries processing and stability along with state of the art technology in food and pharmaceutical systems This timely publication will be welcomed by academic and industrial researchers and professionals in the pharmaceuticals food materials and polymer sciences **Ab Initio Molecular Dynamics** Dominik Marx,Jürg Hutter,2009-04-30 Ab initio molecular dynamics revolutionized the field of realistic computer simulation of complex molecular systems and processes including chemical reactions by unifying molecular dynamics and electronic structure theory This book provides the first coherent presentation

of this rapidly growing field covering a vast range of methods and their applications from basic theory to advanced methods This fascinating text for graduate students and researchers contains systematic derivations of various ab initio molecular dynamics techniques to enable readers to understand and assess the merits and drawbacks of commonly used methods It also discusses the special features of the widely used Car Parrinello approach correcting various misconceptions currently found in research literature The book contains pseudo code and program layout for typical plane wave electronic structure codes allowing newcomers to the field to understand commonly used program packages and enabling developers to improve and add new features in their code **Water Chemistry** Patrick Brezonik,William Arnold,2011-03-22 Water Chemistry provides students with the tools necessary to understand the processes that control the chemical species present in waters of both natural and engineered systems After providing basic information about water itself and the chemical composition of water in environmental systems the text covers the necessary theory thermodynamics activity and kinetics and background material to solve problems It emphasizes that both equilibrium and kinetic processes are important in aquatic systems The book does not merely focus on inorganic constituents but also on the fate and reactions of organic chemicals The solving of quantitative equilibrium and kinetic problems using mathematical graphical and computational tools is emphasized throughout presentations on acid base chemistry complexation of metal ions solubility of minerals and oxidation reduction reactions The use of these problem solving tools is then extended in the presentation of topics relevant to natural systems including dissolved oxygen nutrient chemistry geochemical controls on chemical composition photochemistry and natural organic matter The kinetics and equilibria relevant to engineered systems e g chlorination and disinfection chemistry sorption and surface chemistry and organic contaminant chemistry are also discussed Numerous in chapter examples that show the application of theory and demonstrate how problems are solved using algebraic graphical and computer based techniques are included Examples are relevant to both natural waters and engineered systems **Journal of Solution Chemistry** ,1994 *Chemical Principles* Peter Atkins,Loretta Jones,2007-08 Written for calculus inclusive general chemistry courses Chemical Principles helps students develop chemical insight by showing the connections between fundamental chemical ideas and their applications Unlike other texts it begins with a detailed picture of the atom then builds toward chemistry s frontier continually demonstrating how to solve problems think about nature and matter and visualize chemical concepts as working chemists do Flexibility in level is crucial and is largely established through clearly labeling separating in boxes the calculus coverage in the text Instructors have the option of whether to incorporate calculus in the coverage of topics The multimedia integration of Chemical Principles is more deeply established than any other text for this course Through the unique eBook the comprehensive Chemistry Portal Living Graph icons that connect the text to the Web and a complete set of animations students can take full advantage of the wealth of resources available to them to help them learn and gain a deeper understanding High Temperature Gas-Solid Reactions in Earth and Planetary Processes Penelope

King,Bruce Fegley,Terry Seward,2018-12-03 High temperature gas solid reactions are ubiquitous on planetary bodies distributing chemical elements over a range of geologic settings and temperatures This volume reviews the critical role gas solid reactions play in early solar system formation volcanism metamorphism and industrial processes The field evidence experimental and theoretical approaches for examining gas solid reaction are presented building on advances in fields outside of Earth Sciences Computational chemistry techniques are used to probe the nature of molecular clusters and solvation in volcanic vapors and mineral gas reaction mechanisms Specialised analytical methods for characterising solid reaction products are included since these reactions commonly form thin or dispersed films and metastable minerals Finally the volume contains rich field examples laboratory experiments and thermodynamic modelling and kinetics of gas solid reactions on Earth Venus and beyond , **CRC Handbook of Chemistry and Physics** David R. Lide,1995-03-09 This student edition features over 50 new or completely revised tables most of which are in the areas of fluid properties and properties of solids The book also features extensive references to other compilations and databases that contain additional information Proceedings of the Indian National Science Academy Indian National Science Academy,2003

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