

Chem 331, Exam 1

Friday, September 21, 2007 (100 points total)

$$R = 8.3145 \text{ J K}^{-1} \text{ mol}^{-1} = 0.082058 \text{ L atm K}^{-1} \text{ mol}^{-1}$$

$$1 \text{ atm} = 101.325 \text{ kPa} = 760 \text{ Torr} = 1.01325 \text{ bar} \quad (1 \text{ bar} = 10^5 \text{ Pa}); \quad 1 \text{ L} = 1 \text{ dm}^3$$

$$\mu_{J-T} = \left(\frac{\partial T}{\partial P} \right)_H, \quad \left(\frac{T_f}{T_i} \right) = \left(\frac{V_f}{V_i} \right)^{\gamma - \frac{C_v}{C_p}}, \quad w = -nRT \ln \frac{V_f}{V_i}$$

Problems (20 pts each) Show all work

- 1.) Two moles of an ideal monatomic gas initially at a pressure of 1.00 bar and 25°C is compressed adiabatically and irreversibly by application of a constant external pressure of 15.00 bar, until the final pressure of the gas reaches 10.00 bar. Assume the gas has molar heat capacity $\bar{C}_v = 3R/2$ and is independent of temperature.

- (a) Calculate the heat absorbed by the gas.
 (b) Calculate the final temperature of the gas.

$$\begin{aligned} \text{a)} \quad q &= 0 \quad (\text{adiabatic}) \\ \text{b)} \quad \Delta U &= w \quad \Rightarrow \quad \int_{T_i}^{T_f} n \bar{C}_v dT = \int_{V_i}^{V_f} -P_{\text{ext}} dV \quad (\text{since ideal gas}) \end{aligned}$$

$$\begin{aligned} n \bar{C}_v (T_f - T_i) &= -P_{\text{ext}} (V_f - V_i) \\ &= -P_{\text{ext}} \left[\frac{nRT_f}{P_f} - \frac{nRT_i}{P_i} \right] \end{aligned}$$

rearrange:

$$\begin{aligned} T_f &= T_i \frac{n \bar{C}_v + nR \frac{P_{\text{ext}}}{P_i}}{n \bar{C}_v + nR \frac{P_{\text{ext}}}{P_f}} \\ &= 298 \frac{(2 \cdot 3R/2) + (2)(R)(15)}{(2 \cdot 3R/2) + (2)(R)(10)} \end{aligned}$$

$$= 1639 \text{ K}$$

Physical Chemistry Exam Quiz Homework With Solution

JA Banks



Physical Chemistry Exam Quiz Homework With Solution:

Teaching Chemistry in Higher Education Michael Seery, Claire Mc Donnell, 2019-07-01 Teaching Chemistry in Higher Education celebrates the contributions of Professor Tina Overton to the scholarship and practice of teaching and learning in chemistry education. Leading educators in United Kingdom, Ireland, and Australia—three countries where Tina has had enormous impact and influence—have contributed chapters on innovative approaches that are well established in their own practice. Each chapter introduces the key education literature underpinning the approach being described. Rationales are discussed in the context of attributes and learning outcomes desirable in modern chemistry curricula. True to Tina's personal philosophy, chapters offer pragmatic and useful guidance on the implementation of innovative teaching approaches, drawing from the authors' experience of their own practice and evaluations of their implementation. Each chapter also offers key guidance points for implementation in readers' own settings so as to maximise their adaptability. Chapters are supplemented with further reading and supplementary materials on the book's website: overtonfestschrift.wordpress.com. Chapter topics include innovative approaches in facilitating group work, problem solving, context and problem-based learning, embedding transferable skills, and laboratory education—all themes relating to the scholarly interests of Professor Tina Overton. About the Editors: Michael Seery is Professor of Chemistry Education at the University of Edinburgh and is Editor of *Chemistry Education Research and Practice*. Claire Mc Donnell is Assistant Head of School of Chemical and Pharmaceutical Sciences at Technological University Dublin. Cover Art: Christopher Armstrong, University of Hull.

Using Physical Models of Biomolecules to Teach Concepts of Biochemical Structure in Introductory Undergraduate Chemistry John Yi, 2004

Chemistry Education and Sustainability in the Global Age Mei-Hung Chiu, Hsiao-Lin Tuan, Hsin-Kai Wu, Jing-Wen Lin, Chin-Cheng Chou, 2012-12-05 This edited volume of papers from the twenty-first International Conference on Chemical Education attests to our rapidly changing understanding of the chemistry itself as well as to the potentially enormous material changes in how it might be taught in the future. Covering the full range of appropriate topics, the book features work exploring themes as various as e-learning and innovations in instruction and micro-scale lab chemistry. In sum, the 29 articles published in these pages focus the reader's attention on ways to raise the quality of chemistry teaching and learning, promoting the public understanding of chemistry, deploying innovative technology in pedagogy, practice, and research, and the value of chemistry as a tool for highlighting sustainability issues in the global community. Thus, the ambitious dual aim achieved in these pages is, on the one hand, to foster improvements in the teaching and communication of chemistry, whether to students or the public, and secondly, to promote advances in our broader understanding of the subject that will have positive knock-on effects on the world's citizens and environment. In doing so, the book addresses, as did the conference, the neglect suffered in the chemistry classroom by issues connected to globalization, even as it outlines ways to bring the subject alive in the classroom through the use of innovative technologies.

The Hidden Curriculum - Faculty Made Tests in Science

Sheila Tobias,1997 **United States Air Force Academy Preparatory School Catalog** United States Air Force Academy. Preparatory School,1980 *The Advisor, Teacher-course Evaluation* University of Illinois at Urbana-Champaign. Student Senate,1969 **Bulletin** ,1961 *Holt Biology Chapter Resource File 19* Holt Rinehart & Winston,Holt, Rinehart and Winston Staff,2004 **Interactive Learning** David G. Brown,2000 Interactive Learning is a rich collection of best practices in the use of instructional technology from 36 of America s most wired campuses In 93 brief informal and practical vignettes professors show how they transformed courses with technology discuss how the technology affected teaching and learning and distill important lessons learned The accounts are written in lay language and are brimming with information and examples that will help anyone from the novice to the computer savvy who is interested in classroom applications of technology **American Druggist and Pharmaceutical Record** ,1895 *Lab Manual for General, Organic, and Biochemistry* Denise Guinn,Rebecca Brewer,2009-08-21 Teaching all of the necessary concepts within the constraints of a one term chemistry course can be challenging Authors Denise Guinn and Rebecca Brewer have drawn on their 14 years of experience with the one term course to write a textbook that incorporates biochemistry and organic chemistry throughout each chapter emphasizes cases related to allied health and provides students with the practical quantitative skills they will need in their professional lives Essentials of General Organic and Biochemistry captures student interest from day one with a focus on attention getting applications relevant to health care professionals and as much pertinent chemistry as is reasonably possible in a one term course Students value their experience with chemistry getting a true sense of just how relevant it is to their chosen profession To browse a sample chapter view sample ChemCasts and more visit www.whfreeman.com/gob

Active Learning: Theoretical Perspectives, Empirical Studies and Design Profiles Robert Cassidy,Elizabeth S.

Charles,James D. Slotta,Nathaniel Lasry,2019-07-11 This book represents the emerging efforts of a growing international network of researchers and practitioners to promote the development and uptake of evidence based pedagogies in higher education at something a level approaching large scale impact By offering a communication venue that attracts and enhances much needed partnerships among practitioners and researchers in pedagogical innovation we aim to change the conversation and focus on how we work and learn together i e extending the implementation and knowledge of co design methods In this first edition of our Research Topic on Active Learning we highlight two of the three types of publications we wish to promote First are studies aimed at understanding the pedagogical designs developed by practitioners in their own practices by bringing to bear the theoretical lenses developed and tested in the education research community These types of studies constitute the practice pull that we see as a necessary counterbalance to knowledge push in a more productive pedagogical innovation ecosystem based on research practitioner partnerships Second are studies empirically examining the implementations of evidence based designs in naturalistic settings and under naturalistic conditions Interestingly the teams conducting these studies are already exemplars of partnerships between researchers and practitioners who are uniquely

positioned as in between straddling the two worlds As a result these publications represent both the rigours of research and the pragmatism of reflective practice In forthcoming editions we will add to this collection a third type of publication design profiles These will present practitioner developed pedagogical designs at varying levels of abstraction to be held to scrutiny amongst practitioners instructional designers and researchers alike We hope by bringing these types of studies together in an open access format that we may contribute to the development of new forms of practitioner researcher interactions that promote co design in pedagogical innovation

Machine Learning and Artificial Intelligence Jon-Lark Kim,2023-11-15
Machine learning ML and intelligent systems are now comprehensively applied for the solving of practical problems Emerging techniques such as big data analysis deep neural networks AI and IoT have been adopted and integrated into the development and application of machine learning and intelligent systems and their wide application in industry medicine engineering education and other mainstream domains have made them a part of everyday life This book presents the proceedings of MLIS 2023 the 5th International Conference on Machine Learning and Intelligent Systems held as a hybrid event from 17 20 November 2023 in Macau China This annual conference aims to provide a platform for a knowledge exchange of the most recent scientific and technological advances in the field of ML and intelligent systems and to strengthen links within the scientific community in related research areas A total of 80 submissions were received for the conference of which 20 papers were selected for presentation and publication in these proceedings following a rigorous peer review process Papers were assessed on originality scientific practical significance compelling logical reasoning and language and the selected papers cover a wide range of topics and provide innovative and original ideas or results of general significance in the field of ML and intelligent systems Providing a current overview of developments in the fields of machine learning and intelligent systems the book will be of interest to all those working in this field

2008 Physics Education Research Conference Charles Henderson,Mel Sabella,Leon Hsu,2008-11-21 The 2008 Physics Education Research Conference brought together researchers studying a wide variety of topics in physics education The conference theme was Physics Education Research with Diverse Student Populations Researchers specializing in diversity issues were invited to help establish a dialog and spur discussion about how the results from this work can inform the physics education research community The organizers encouraged physics education researchers who are using research based instructional materials with non traditional students at either the pre college level or the college level to share their experiences as instructors and researchers in these classes

Chapter Resource 13 Theory/Evolution Biology Holt Rinehart & Winston,Holt, Rinehart and Winston Staff,2004

McGraw-Hill's 500 Physical Chemistry Questions: Ace Your College Exams Richard H. Langley,2012-12-12 500 Ways to Achieve Your Best Grades We want you to succeed on your physical chemistry midterm and final exams That s why we ve selected these 500 questions to help you study more effectively use your preparation time wisely and get your best grades These questions and answers are similar to the ones you ll find on a typical college exam so

you will know what to expect on test day Each question includes explanations for right and wrong answers for your full understanding of the concepts Whether you have been studying all year or are doing a last minute review McGraw Hill s 500 Physical Chemistry Questions will help you achieve the final grade you desire Sharpen your subject knowledge and build your test taking confidence with 500 essential physical chemistry questions with answers Explanations for every answer Coverage of physical chemistry from ethical theory to epistemology **Science** John Michels (Journalist),1922 **Holt Chemistry** Ralph Thomas Myers,2004 **School & Society** James McKeen Cattell,Will Carson Ryan,Raymond Walters,1928 **The College Blue Book** Huber William Hurt,Harriett-Jeanne Hurt,1965

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the left-hand side of the central console. Table of fuses: 21 20 19 25 A 5A. 18 17 16 15 A 30 ... Renault Clio III (2006-2012) fuses and relays Here you will find fuse box diagrams of Renault Clio III 2006, 2007, 2008, 2009, 2010, 2011 and 2012, get information about the location of the fuse panels ... Fuse box diagram Renault Clio 3 2005 3 days ago — The box with fuses and relays is located on the left side and is closed with a protective cover. Look like this. Photo 1. Diagram. Fuses and relays Renault Clio 3 (CR / BR; 2005-2013) Apr 15, 2021 — Mounting boxes are located on the right side of the engine compartment. Primary fuse box. General view of the main box. Diagram ... Mk1 Ph3 Clio Van fusebox/relay diagram Mar 4, 2008 — Hi, Does anyone have a diagram to show which relays go where in the fusebox on a Mk1 Clio? I doubt it makes any difference but it's a Mk1 ... Clio Mk3 fuse box wiring *** Solved Aug 6, 2020 — Every fuse in both fuse boxes tests OK, yet there is no 12V at the cluster connector. There's no corrosion in bulb holders, earth is good, all ... A Century of Miracles - H.A. Drake In A Century of Miracles, historian H. A. Drake explores the role miracle stories such as these played in helping Christians, pagans, and Jews think about ... A Century of Miracles: Christians, Pagans, Jews, and the ... May 11, 2018 — This book by H. A. Drake is aimed at a semi-popular audience, and is a showcase for his most valuable qualities: an engaging style, a patient ... A Century of Miracles: Christians, Pagans, Jews, and the ... In A Century of Miracles, historian H. A. Drake explores the role miracle stories played in helping Christians, pagans, and Jews think about themselves and each ... A Century of Miracles This strikingly unfamiliar image of a well-known modern battle brings us close to the world examined by Hal Drake in his new book, which puts miracles—or, more ... A Century of Miracles - H. A. Drake In A Century of Miracles, historian H. A. Drake explores the role miracle stories played in helping Christians, pagans, and Jews think about themselves and each ... A Century of Miracles by Drake, H.A. A hugely fun read. One learns of Constantine's miraculous vision--both the pre-Christian version and the post-Christian rewrite. The one moves on to a lesser ... A Century of Miracles (Paperback) Oct 1, 2020 — In A Century of Miracles, historian H. A. Drake explores the role miracle stories such as these played in helping Christians, pagans, and Jews ... A Century of Miracles Oct 1, 2020 — Thoroughly researched within a wide range of faiths and belief systems, A Century of Miracles provides an absorbing illumination of this complex ... A Century of Miracles: Christians, Pagans, Jews, and the ... A Century of Miracles: Christians, Pagans, Jews, and the Supernatural, 312-410 by Drake, H. A. - ISBN 10: 0199367418 - ISBN 13: 9780199367412 - Oxford ... A Century of Miracles by H.A. Drake, Paperback In A Century of Miracles, historian H. A. Drake explores the role miracle stories such as these played in helping Christians, pagans, and Jews think about ...