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KEY=TEACHING - KATELYN BATES

Compilation of Minimum and Maximum Isotope Ratios of Selected Elements in Naturally Occurring Terrestrial Materials and Reagents

Documented variations in the isotopic compositions of some chemical elements are responsible for expanded uncertainties in the standard atomic weights published by the Commission on Atomic Weights and Isotopic Abundances of the International Union of Pure and Applied Chemistry. This report summarizes reported variations in the isotopic compositions of 20 elements that are due to physical and chemical fractionation processes (not due to radioactive decay) and their effects on the standard atomic weight uncertainties. For 11 of those elements (hydrogen, lithium, boron, carbon, nitrogen, oxygen, silicon, sulfur, chlorine, copper, and selenium), standard atomic weight uncertainties have been assigned values that are substantially larger than analytical uncertainties because of common isotope abundance variations in materials of natural terrestrial origin. For 2 elements (chromium and thallium), recently reported isotope abundance variations potentially are large enough to result in future expansion of their atomic weight uncertainties. For 7 elements (magnesium, calcium, iron, zinc, molybdenum, palladium, and tellurium), documented isotope-abundance variations in materials of natural terrestrial origin are too small to have a significant effect on their standard atomic weight uncertainties.

Environmental Isotopes in Hydrogeology

CRC Press Groundwater is an increasingly important resource to human populations around the world, and the study and protection of groundwater is an essential part of hydrogeology - the subset of hydrology that concentrates on the subsurface. Environmental isotopes, naturally occurring nuclides in water and solutes, have become fundamental tools for tracing the recharge, history, and contamination of groundwater.

Isotopes for Medicine and the Life Sciences

National Academies Press Radioactive isotopes and enriched stable isotopes are used widely in medicine, agriculture, industry, and science, where their application allows us to perform many tasks more accurately, more simply, less expensively, and more quickly than would otherwise be possible. Indeed, in many cases--for example, biological tracers--there is no alternative. In a stellar example of "technology transfer" that began before the term was popular, the Department of Energy (DOE) and its predecessors has supported the development and application of isotopes and their transfer to the private sector. The DOE is now at an important crossroads: Isotope production has suffered as support for DOE's laboratories has declined. In response to a DOE request, this book is an intensive examination of isotope production and availability, including the education and training of those who will be needed to sustain the flow of radioactive and stable materials from their sources to the laboratories and medical care facilities in which they are used. Chapters include an examination of enriched stable isotopes; reactor and accelerator-produced radionuclides; partnerships among industries, national laboratories, and universities; and national isotope policy.

The Supply of Medical Isotopes

An Economic Diagnosis and Possible Solutions

This report explores the main reasons behind the unreliable supply of Technetium-99m (Tc-99m) in health-care systems and policy options to address the issue. Tc-99m is used in 85% of nuclear medicine diagnostic scans performed worldwide - around 30 million patient examinations every year. These scans allow diagnoses of diseases in many parts of the human body, including the skeleton, heart and circulatory system, and the brain. Medical isotopes are subject to radioactive decay and have to be delivered just-in-time through a complex supply chain. However, ageing production facilities and a lack of investment have made the supply of Tc-99m unreliable. This report analyses the use and substitutability of Tc-99m in health care, health-care provider payment mechanisms for scans, and the structure of the supply chain. It concludes that the main reasons for unreliable supply are that production is not economically viable and that the structure of the supply chain prevents producers from charging prices that reflect the full costs of production and supply.

Safe Management of Wastes from Health-care Activities

World Health Organization

Pearson Chemistry 11 New South Wales Skills and Assessment Book

The write-in Skills and Assessment Activity Books focus on working scientifically skills and assessment. They are designed to consolidate concepts learnt in class. Students are also provided with regular opportunities for reflection and self-evaluation throughout the book.

Pearson Chemistry Queensland 11 Skills and Assessment Book

Introducing the Pearson Chemistry 11 Queensland Skills and Assessment Book. Fully aligned to the new QCE 2019 Syllabus. Write in Skills and Assessment Book written to support teaching and learning across all requirements of the new Syllabus, providing practice, application and consolidation of learning. Opportunities to apply and practice performing calculations and using algorithms are integrated throughout worksheets, practical activities and question sets. All activities are mapped from the Student Book at the recommend point of engagement in the teaching program, making integration of practice and rich learning activities a seamless inclusion. Developed by highly experienced and expert author teams, with lead Queensland specialists who have a working understand what teachers

are looking for to support working with a new syllabus.

Chemistry: An Atoms First Approach

Cengage Learning Steve and Susan Zumdahl's texts focus on helping students build critical thinking skills through the process of becoming independent problem-solvers. They help students learn to think like a chemists so they can apply the problem solving process to all aspects of their lives. In CHEMISTRY: AN ATOMS FIRST APPROACH, the Zumdahls use a meaningful approach that begins with the atom and proceeds through the concept of molecules, structure, and bonding, to more complex materials and their properties. Because this approach differs from what most students have experienced in high school courses, it encourages them to focus on conceptual learning early in the course, rather than relying on memorization and a plug and chug method of problem solving that even the best students can fall back on when confronted with familiar material. The atoms first organization provides an opportunity for students to use the tools of critical thinkers: to ask questions, to apply rules and models and to evaluate outcomes. Important Notice: Media content referenced within the product description or the product text may not be available in the ebook version.

The National Curriculum in England (2020 Update)

In this UPDATED edition of the National Curriculum for England for Key Stages 1 and 2, you will find full programmes of study for all 11 original primary subjects plus three new subjects: Relationships Education; Relationships and Sex Education; and Health Education (to be taught in English schools in September 2020). The National Curriculum for England sets out the framework for the national curriculum at key stages 1 and 2. This statutory guidance includes information about the school curriculum and the national curriculum the aims for the national curriculum statements on inclusion, and on pupils' competence in numeracy and maths, language and literacy across the school programmes of study for KS 1 and 2 for all the subjects that are taught at these key stages.

Geochemistry

John Wiley & Sons This book provides a comprehensive introduction to the field of geochemistry. The book first lays out the 'geochemical toolbox': the basic principles and techniques of modern geochemistry, beginning with a review of thermodynamics and kinetics as they apply to the Earth and its environs. These basic concepts are then applied to understanding processes in aqueous systems and the behavior of trace elements in magmatic systems. Subsequent chapters introduce radiogenic and stable isotope geochemistry and illustrate their application to such diverse topics as determining geologic time, ancient climates, and the diets of prehistoric peoples. The focus then broadens to the formation of the solar system, the Earth, and the elements themselves. Then the composition of the Earth itself becomes the topic, examining the composition of the core, the mantle, and the crust and exploring how this structure originated. A final chapter covers organic chemistry, including the origin of fossil fuels and the carbon cycle's role in controlling Earth's climate, both in the geologic past and the rapidly changing present. Geochemistry is essential reading for all earth science students, as well as for researchers and applied scientists who require an introduction to the essential theory of geochemistry, and a survey of its applications in the earth and environmental sciences. Additional resources can be found at: www.wiley.com/go/white/geochemistry

Problems and Solutions on Atomic, Nuclear and Particle Physics

World Scientific Publishing Company This book, part of the seven-volume series Major American Universities PhD Qualifying Questions and Solutions contains detailed solutions to 483 questions/problems on atomic, molecular, nuclear and particle physics, as well as experimental methodology. The problems are of a standard appropriate to advanced undergraduate and graduate syllabi, and blend together two objectives — understanding of physical principles and practical application. The volume is an invaluable supplement to textbooks.

Pregnancy Day By Day

Penguin The complete guide to pregnancy, day-by-day No other pregnancy book provides this level of detail, allied with such extraordinary photographs, 3D scans and illustrations which reveal in unprecedented clarity exactly what is happening to you and your baby every single day. From early fetal development to how your hormones prepare you for birth, learn from world-class experts. Plus, obstetricians, midwives and parents advise on your baby's development, medical matters, your changing body, diet, fitness and much more. A special hour-by-hour rundown of what to expect during and immediately after birth, plus further reassurance for the first two weeks of your baby's life, will give a helping hand through the culmination of your pregnancy, from pain relief to those first intimate and unique moments between you and your child.

Environmental Consequences of the Chernobyl Accident and Their Remediation

Twenty Years of Experience

IAEA The explosion on 26 April 1986 at the Chernobyl nuclear power plant and the consequent reactor fire resulted in an unprecedented release of radioactive material from a nuclear reactor and adverse consequences for the public and the environment. Although the accident occurred nearly two decades ago, controversy still surrounds the real impact of the disaster. Therefore the IAEA, in cooperation with other UN bodies, the World Bank, as well as the competent authorities of Belarus, the Russian Federation and Ukraine, established the Chernobyl Forum in 2003. The mission of the Forum was to generate 'authoritative consensual statements' on the environmental consequences and health effects attributable to radiation exposure arising from the accident as well as to provide advice on environmental remediation and special health care programmes, and to suggest areas in which further research is required. This report presents the findings and recommendations of the Chernobyl Forum concerning the environmental effects of the Chernobyl accident.

Lunar Sourcebook

A User's Guide to the Moon

CUP Archive The only work to date to collect data gathered during the American and Soviet missions in an accessible and complete reference of current scientific and technical information about the Moon.

Introduction to Chemistry

For Students in Nebo School District

Designed for students in Nebo School District, this text covers the Utah State Core Curriculum for chemistry with few additional topics.

CO₂ in Seawater: Equilibrium, Kinetics, Isotopes

Elsevier Carbon dioxide is the most important greenhouse gas after water vapor in the atmosphere of the earth. More than 98% of the carbon of the atmosphere-ocean system is stored in the oceans as dissolved inorganic carbon. The key for understanding critical processes of the marine carbon cycle is a sound knowledge of the seawater carbonate chemistry, including equilibrium and nonequilibrium properties as well as stable isotope fractionation. Presenting the first coherent text describing equilibrium and nonequilibrium properties and stable isotope fractionation among the elements of the carbonate system. This volume presents an overview and a synthesis of these subjects which should be useful for graduate students and researchers in various fields such as biogeochemistry, chemical oceanography, paleoceanography, marine biology, marine chemistry, marine geology, and others. The volume includes an introduction to the equilibrium properties of the carbonate system in which basic concepts such as equilibrium constants, alkalinity, pH scales, and buffering are discussed. It also deals with the nonequilibrium properties of the seawater carbonate chemistry. Whereas principle of chemical kinetics are recapitulated, reaction rates and relaxation times of the carbonate system are considered in details. The book also provides a general introduction to stable isotope fractionation and describes the partitioning of carbon, oxygen, and boron isotopes between the species of the carbonate system. The appendix contains formulas for the equilibrium constants of the carbonate system, mathematical expressions to calculate carbonate system parameters, answers to exercises and more.

Field Book for Describing and Sampling Soils

The Ultimate Interactive Revision Guide

National 5 Chemistry

Crime Scene Investigation

A Guide for Law Enforcement

This is a guide to recommended practices for crime scene investigation. The guide is presented in five major sections, with sub-sections as noted: (1) Arriving at the Scene: Initial Response/Prioritization of Efforts (receipt of information, safety procedures, emergency care, secure and control persons at the scene, boundaries, turn over control of the scene and brief investigator/s in charge, document actions and observations); (2) Preliminary Documentation and Evaluation of the Scene (scene assessment, "walk-through" and initial documentation); (3) Processing the Scene (team composition, contamination control, documentation and prioritize, collect, preserve, inventory, package, transport, and submit evidence); (4) Completing and Recording the Crime Scene Investigation (establish debriefing team, perform final survey, document the scene); and (5) Crime Scene Equipment (initial responding officers, investigator/evidence technician, evidence collection kits).

Problems and Solutions in Nuclear and Particle Physics

Springer This book presents 140 problems with solutions in introductory nuclear and particle physics. Rather than being only partially provided or simply outlined, as is typically the case in textbooks on nuclear and particle physics, all solutions are explained in detail. Furthermore, different possible approaches are compared. Some of the problems concern the estimation of quantities in realistic experimental situations. In general, solving the problems does not require a substantial mathematics background, and the focus is instead on developing the reader's sense of physics in order to work out the problem in question. Consequently, sections on experimental methods and detection methods constitute a major part of the book. Given its format and content, it offers a valuable resource, not only for undergraduate classes but also for self-assessment in preparation for graduate school entrance and other examinations.

Fast Food Nation

The Dark Side of the All-American Meal

Houghton Mifflin Harcourt Explores the homogenization of American culture and the impact of the fast food industry on modern-day health, economy, politics, popular culture, entertainment, and food production.

Isotope Methods for Dating Old Groundwater

This guidebook provides theoretical and practical information for using a variety of isotope tracers for dating "old" groundwater, i.e. water stored in geological formations for periods ranging from about 1000 to one million years. Theoretical underpinnings of the methods and guidelines for their use in different hydrogeological environments are described. The guidebook also presents a number of case studies providing insight into how various isotopes have been used in aquifers around the world. The methods, findings and conclusions presented in this publication will enable students and practicing groundwater scientists to evaluate the use of isotope dating tools for specific issues related to the assessment and management of groundwater resources. In addition, the guidebook will be of use to the scientific community interested in issues related to radioactive waste disposal in geological repositories.

Stable Isotope Geochemistry

Mineralogical Society of Amer Volume 43 of Reviews in Mineralogy and Geochemistry reviews Stable Isotope Geochemistry. In terms of new technology, new sub-disciplines, and numbers of researchers, the field has changed more in the past decade than in any other since that of its b

Edexcel IGCSE Chemistry

Pearson Education India

Introduction to Statistical Modelling

Springer This book is about generalized linear models as described by Nelder and Wedderburn (1972). This approach provides a unified theoretical and computational framework for the most commonly used statistical methods: regression, analysis of variance and covariance, logistic regression, log-linear models for contingency tables and several more specialized techniques. More advanced expositions of the subject are given by McCullagh and Nelder (1983) and Andersen (1980). The emphasis is on the use of statistical models to investigate substantive questions rather than to produce mathematical descriptions of the data. Therefore parameter estimation and hypothesis testing are stressed. I have assumed that the reader is familiar with the most commonly used statistical concepts and methods and has some basic knowledge of calculus and matrix algebra. Short numerical examples are used to illustrate the main points. In writing this book I have been helped greatly by the comments and criticism of my students and colleagues, especially Anne Young. However, the choice of material, and the obscurities and errors are my responsibility and I apologize to the reader for any irritation caused by them. For typing the manuscript under difficult conditions I am grateful to Anne McKim, Jan Garnsey, Cath Claydon and Julie Latimer.

Climate Change 1992

Cambridge University Press An essential reference and companion to the 1990 IPCC Report on Climate Change.

GCSE Science Single Award CCEA

Foundation and Higher Tier

Help your students perfect their understanding and prepare for examinations with accessible science content presented at the right level. An accessible Revision Guide that completely covers the most recent specification with up-to-date revision questions. Written by best-selling authors with substantial examining experience at both Foundation and Higher level for CCEA. - Ensures students' understanding with clear worked examples and content written at the correct level - Provides practice for assessment with lots of Revision Questions - Enables students to improve their grade with helpful exam tips that covers key terminology and guidance on preparing for assessment - Helps students to practise and remember key terms with a full Glossary

The Carbon Cycle

Cambridge University Press Reducing carbon dioxide (CO₂) emissions is imperative to stabilizing our future climate. Our ability to reduce these emissions combined with an understanding of how much fossil-fuel-derived CO₂ the oceans and plants can absorb is central to mitigating climate change. In *The Carbon Cycle*, leading scientists examine how atmospheric carbon dioxide concentrations have changed in the past and how this may affect the concentrations in the future. They look at the carbon budget and the "missing sink" for carbon dioxide. They offer approaches to modeling the carbon cycle, providing mathematical tools for predicting future levels of carbon dioxide. This comprehensive text incorporates findings from the recent IPCC reports. New insights, and a convergence of ideas and views across several disciplines make this book an important contribution to the global change literature.

The Machine Gunners

Nelson Thornes It's 1940, and Britain is at war. Young Chas McGill has the second-best collection of war souvenirs in town, but desperately wants it to be the best. Amidst the bombs and air raids, Chas and his friends plan their own war effort in their newly built bunker. Friendships are forged and loyalties tested, in the adventure of a lifetime. Robert Westall's "The Machine Gunners" has been read, studied - and loved - by successive generations of younger readers. It won the Carnegie Medal and was voted one of the most important children's novels of the past seventy years. This thrilling stage adaptation comes from the award-winning playwright Ali Taylor, and premiered at the Polka Theatre, London. It provides rich opportunities for discussion in the classroom, and for staging by schools, youth theatres and amateur companies.

Tolerable upper intake levels for vitamins and minerals

Nuclear Energy

An Introduction to the Concepts, Systems, and Applications of Nuclear Processes

Elsevier This expanded, revised, and updated fourth edition of *Nuclear Energy* maintains the tradition of providing clear and comprehensive coverage of all aspects of the subject, with emphasis on the explanation of trends and developments. As in earlier editions, the book is divided into three parts that achieve a natural flow of ideas: **Basic Concepts**, including the fundamentals of energy, particle interactions, fission, and fusion; **Nuclear Systems**, including accelerators, isotope separators, detectors, and nuclear reactors; and **Nuclear Energy and Man**, covering the many applications of radionuclides, radiation, and reactors, along with a discussion of wastes and weapons. A minimum of mathematical background is required, but there is ample opportunity to learn characteristic numbers through the illustrative calculations and the exercises. An updated **Solution Manual** is available to the instructor. A new feature to aid the student is a set of some 50 **Computer Exercises**, using a diskette of personal computer programs in BASIC and spreadsheet, supplied by the author at a nominal cost. The book is of principal value as an introduction to nuclear science and technology for early college students, but can be of benefit to science teachers and lecturers, nuclear utility trainees and engineers in other fields.

Radiological Characterization of Shut Down Nuclear Reactors for Decommissioning Purposes

This report describes and assesses radiological characterization as a precursor to decommissioning. It shows the influence of the radioactive inventory on the planning and strategies of decommissioning and also presents an extensive overview of characterization results on various reactors which have been or are being decommissioned.

The Limits to Growth

A Report for the Club of Rome's Project on the Predicament of Mankind

Iron and Health

Stationery Office/Tso The report provides a comprehensive review of the role of iron in human nutrition and also assesses the adequacy of iron intakes and status of the general and low income populations in the UK. For the general population, SACN is recommending a public health approach to achieving adequate iron status based on a healthy balanced diet that includes a variety of foods containing iron. This is a change to current dietary advice that iron-rich foods should be consumed at the same time as foods/drinks which enhance iron absorption (e.g., fruit, meat) but should not be consumed with those that inhibit iron absorption (e.g., tea, coffee, milk). Groups identified as being at risk of iron deficiency anaemia include toddlers, girls and women of reproductive age, and some adult groups aged over 65 years. Health professionals need to be aware of increased risk of iron deficiency anaemia in these groups and those with evidence suggestive of iron deficiency anaemia should receive appropriate clinical assessment and advice. Red and processed meat is probably associated with an increased risk of colorectal cancer and SACN is advising high consumers of red and processed meat to consider reducing their intakes. Reducing such intake to the population average for adult consumers (estimated to be about 70 g/day cooked weight in 2000/01) would have little effect on the proportion of the population with iron intakes below the lower limit of recommended intake for iron.

Chemistry 2e

Once in a House on Fire

Pan Macmillan 'One of the most extraordinary stories you will ever read of the triumph of the human spirit' Daily MailSet in 1970s Manchester, Once in a House on Fire tells the true story of three sisters and their mother, a close-knit and loving family forced to battle with poverty, abuse and the effects of depression. Beautifully written and deeply inspiring, with a new afterword by Andrea Ashworth, it is a book that will stay with its readers for ever.

Mass Spectrometry

Principles and Applications

Wiley Offers a complete overview of the principles, theories and key applications of modern mass spectrometry in this introductory textbook. Following on from the highly successful first edition, this edition is extensively updated including new techniques and applications. All instrumental aspects of mass spectrometry are clearly and concisely described; sources, analysers and detectors. * Revised and updated * Numerous examples and illustrations are combined with a series of exercises to help encourage student understanding * Includes biological applications, which have been significantly expanded and updated * Also includes coverage of ESI and MALDI

Production of Long Lived Parent Radionuclides for Generators, 68Ge, 82Sr, 90Sr and 188W.

United Nations Publications This book provides information on the production and processing of four important long lived parent radionuclides, 68Ge, 82Sr, 90Sr and 188W, used for the preparation of generators for nuclear medicine applications such as positron emission tomography and therapy. It includes descriptions of the production routes for and process chemistry of the selected parent radionuclides, including relevant separation approaches. Information on use of the generator system and on physical and chemical characteristics is also provided.

Description of Input and Examples for Phreeqc Version 3

A Computer Program for Speciation, Batch-reaction, One-dimensional Transport, and Inverse Geochemical Calculations

Createspace Independent Publishing Platform PHREEQC version 3 is a computer program written in the C and C++ programming languages that is designed to perform a wide variety of aqueous geochemical calculations. PHREEQC implements several types of aqueous models: two ion-association aqueous models (the Lawrence Livermore National Laboratory model and WATEQ4F), a Pitzer specific-ion-interaction aqueous model, and the SIT (Specific Ion Interaction Theory) aqueous model. Using any of these aqueous models, PHREEQC has capabilities for (1) speciation and saturation-index calculations; (2) batch-reaction and one-dimensional (1D) transport calculations with reversible and irreversible reactions, which include aqueous, mineral, gas, solid-solution, surface-complexation, and ion-exchange equilibria, and specified mole transfers of reactants, kinetically controlled reactions, mixing of solutions, and pressure and temperature changes; and (3) inverse modeling, which finds sets of mineral and gas mole transfers that account for differences in composition between waters within specified compositional uncertainty limits.

The Fourier Transform and Its Applications

Solutions Manual