

POGIL: Periodic Table Trends

(Adapted from Rush Henrietta CSD)

Why:

The Periodic Table is one of the greatest inventions in the history of man. It allows scientists to predict physical and chemical properties of the elements. Dimitri Mendeleev (a Russian scientist) and Robert Mosley (a British chemist) put together this table in the late 1800's based on properties of the elements known at the time. The trends in these properties as you go across periods and down groups is the subject of this Chem POGIL.

Periodic Table of the Elements

Legend:

- 1. alkali metals
- 2. alkaline earth metals
- 3. transition metals
- 4. metalloids
- 5. nonmetals
- 6. noble gases
- 7. lanthanide series
- 8. actinide series

The table shows elements from Hydrogen (H) to Oganesson (Og). The lanthanide and actinide series are shown below the main table.

Success Criteria:

- Understand the meaning of *atomic radius, reactivity, electronegativity, ionization energy*
- Recognize trends in atomic radius, reactivity, ionization energy and electronegativity as you go across periods and down groups.

Resources:

Reference Table S, Periodic Table, Unit 3 (Chapter 6) Notes, & Chapter 6 in textbook

Prerequisites:

Answer the following questions using the resources above.

- What happens to the number of valence electrons as you go down a group on the periodic table?
- What happens to the number of valence electrons as you go from left to right across a period?
- What happens to the number of energy levels as you go down a group on the periodic table?
- What happens to the number of energy levels as you go from left to right across a period?
- Draw a Lewis structure for a Cl atom.
- Draw a Bohr diagram for the Cl atom. (Draw above!)
- In this lab we will be talking about atomic radius.
 - Look up the atomic radius of Cl on Table S: _____
 - Why is it possible to show the atomic radius using a Bohr diagram but not by using a Lewis structure?
 - On your Bohr diagram draw an arrow to represent the radius of the Cl atom.
- Define *periodic*:
- Define *trend*:

Trends Of The Periodic Table Pogil

D. Michael P. Mingos



Trends Of The Periodic Table Pogil:

Process Oriented Guided Inquiry Learning (POGIL) Richard Samuel Moog, 2008 POGIL is a student centered group learning pedagogy based on current learning theory This volume describes POGIL s theoretical basis its implementations in diverse environments and evaluation of student outcomes

Chemistry Education Javier García-Martínez, Elena Serrano-Torregrosa, 2015-05-04 Winner of the CHOICE Outstanding Academic Title 2017 Award This comprehensive collection of top level contributions provides a thorough review of the vibrant field of chemistry education Highly experienced chemistry professors and education experts cover the latest developments in chemistry learning and teaching as well as the pivotal role of chemistry for shaping a more sustainable future Adopting a practice oriented approach the current challenges and opportunities posed by chemistry education are critically discussed highlighting the pitfalls that can occur in teaching chemistry and how to circumvent them The main topics discussed include best practices project based education blended learning and the role of technology including e learning and science visualization Hands on recommendations on how to optimally implement innovative strategies of teaching chemistry at university and high school levels make this book an essential resource for anybody interested in either teaching or learning chemistry more effectively from experience chemistry professors to secondary school teachers from educators with no formal training in didactics to frustrated chemistry students

Periodic Table, The: Past, Present, And Future Geoff Rayner-canham, 2020-08-04 This is an an absolutely wonderful book that is full of gems about the elements and the periodic table All in all the book is highly recommended to philosophers of chemistry As philosophers we have a natural tendency to concentrate on generalities and not to get too involved in the specifics and the details Above all else this new book reminds us that such an approach needs to be tempered by a detailed knowledge of the exceptions and features that go against the simplified generalities which we so cherish Read Full Review

Eric Scerri Foundations of Chemistry Many questions are dealt with in a clearly written way in this stimulating and innovative book The reader will quickly become interested in the subject and will be taken on tour through this Periodic Table in a very readable way both for students and teachers The number of illustrations is good and clear This book is indeed unique and quite thought provoking This book is highly recommended for students teachers researchers and not only chemists Geologists biochemist and also physicists will find it very interesting to read Read Full Review

Chemistry International That fossilized chart on every classroom wall isn t that The Periodic Table Isn t that what Mendel ev devised about a century ago No and No There are many ways of organizing the chemical elements some of which are thought provoking and which reveal philosophical challenges Where does hydrogen belong Can an element occupy more than one location on the chart Which are the Group 3 elements Is aluminum in the wrong place Why is silver I like thallium I Why is vanadium like molybdenum Why does gold form an auride ion like a halide ion Does an atom know if it is a non metal or metal Which elements are the metalloids Which are the triels So many questions In this stimulating and innovative book the

Reader will be taken on a voyage from the past to the present to the future of the Periodic Table This book is unique This book is readable This book is thought provoking It is a multi dimensional examination of patterns and trends among the chemical elements Every reader will discover something about the chemical elements which will provoke thought and a new appreciation as to how the elements relate together **Chemistry and Our Universe** , Return to the periodic table introduced in Lecture 1 to practice predicting properties of elements based on their electronic structure Then witness what happens when three different alkali metals react with water Theory forecasts a pronounced difference in the result Is there

TRENDS IN THE PERIODIC TABLE OF THE ELEMENTS COMPUTER BASED INSTRUCTION IN CHEMISTRY. ,1992

Understanding the Periodic Table: A Chemistry Guide Cybellium, Welcome to the forefront of knowledge with Cybellium your trusted partner in mastering the cutting edge fields of IT Artificial Intelligence Cyber Security Business Economics and Science Designed for professionals students and enthusiasts alike our comprehensive books empower you to stay ahead in a rapidly evolving digital world Expert Insights Our books provide deep actionable insights that bridge the gap between theory and practical application Up to Date Content Stay current with the latest advancements trends and best practices in IT AI Cybersecurity Business Economics and Science Each guide is regularly updated to reflect the newest developments and challenges Comprehensive Coverage Whether you re a beginner or an advanced learner Cybellium books cover a wide range of topics from foundational principles to specialized knowledge tailored to your level of expertise Become part of a global network of learners and professionals who trust Cybellium to guide their educational journey [www cybellium com](http://www.cybellium.com) **Mastering the Periodic Table** Cybellium Ltd,2024-10-26 Designed for professionals students and enthusiasts alike our comprehensive books empower you to stay ahead in a rapidly evolving digital world Expert Insights Our books provide deep actionable insights that bridge the gap between theory and practical application Up to Date Content Stay current with the latest advancements trends and best practices in IT AI Cybersecurity Business Economics and Science Each guide is regularly updated to reflect the newest developments and challenges Comprehensive Coverage Whether you re a beginner or an advanced learner Cybellium books cover a wide range of topics from foundational principles to specialized knowledge tailored to your level of expertise Become part of a global network of learners and professionals who trust Cybellium to guide their educational journey [www cybellium com](http://www.cybellium.com) *New Ideas in Chemistry from Fresh Energy for the Periodic Law* Henry Bent,2006-09-05 New Ideas calls to mind Aristotle s synopsis of the Iliad and the Odyssey Woman abducted Long war One guy has a hard time getting home End of story The rest is episodes Similarly here Chemical capture of the Left Step Periodic Table One element finds a new home The noblest of the noble gases is not a Noble Gas End of story The rest is novel consequences of the Noble Gas Conclusion Among them overlooked Rules of Triads Block Sizes and Full Shells overlooked block to block trends and a correspondence between elements ordinal numbers in their Groups and orbital s radial quantum numbers and recognition that Pauli s explanation of Periodicity s magic numbers 2 8 18 got the right answer the Pauli

Exclusion Principle for the wrong reason New Ideas ends with suggestions for streamlining the teaching of the mole concept chemical bonding and thermodynamics in order to provide room in the chemistry curriculum for a more thorough treatment of Periodic System Systematics Chemical Periodicity Robert Thomas Sanderson,2013-04-20 **Periodic Table**

Advanced BarCharts, Inc,Mark Jackson,2014-12-31 The ultimate reference tool and lab partner for any student of science durably laminated and designed to fit as much info as possible in this handy 6 page format Separate property tables are broken out for the ease of locating trends while studying and working while other pages offer essential notes about the table s organization and history Consistently a best seller since it s first creation **Trends in the Periodic Table** Open

University. Structure, Bonding and the Periodic Law Course Team,1973 **Trends in the Periodic Table** Open University. S25- Course Team,1972 **The Periodic Table I** D. Michael P. Mingos,2020-02-05 As 2019 has been declared the

International Year of the Periodic Table it is appropriate that Structure and Bonding marks this anniversary with two special volumes In 1869 Dmitri Ivanovitch Mendeleev first proposed his periodic table of the elements He is given the major credit for proposing the conceptual framework used by chemists to systematically inter relate the chemical properties of the elements However the concept of periodicity evolved in distinct stages and was the culmination of work by other chemists over several decades For example Newland s Law of Octaves marked an important step in the evolution of the periodic system since it represented the first clear statement that the properties of the elements repeated after intervals of 8 Mendeleev s predictions demonstrated in an impressive manner how the periodic table could be used to predict the occurrence and properties of new elements Not all of his many predictions proved to be valid but the discovery of scandium gallium and germanium represented sufficient vindication of its utility and they cemented its enduring influence Mendeleev s periodic table was based on the atomic weights of the elements and it was another 50 years before Moseley established that it was the atomic number of the elements that was the fundamental parameter and this led to the prediction of further elements Some have suggested that the periodic table is one of the most fruitful ideas in modern science and that it is comparable to Darwin s theory of evolution by natural selection proposed at approximately the same time There is no doubt that the periodic table occupies a central position in chemistry In its modern form it is reproduced in most undergraduate inorganic textbooks and is present in almost every chemistry lecture room and classroom This first volume provides chemists with an account of the historical development of the Periodic Table and an overview of how the Periodic Table has evolved over the last 150 years It also illustrates how it has guided the research programmes of some distinguished chemists ,

Periodic Table: A Formula Handbook N.B. Singh, Periodic Table A Formula Handbook is a concise and indispensable guide to the elements providing a comprehensive collection of essential formulas properties and trends within the periodic table This handbook equips students scientists and enthusiasts with quick access to vital information on each element including atomic number atomic mass electron configuration and chemical properties With clear organization and easy to

understand explanations this book serves as an invaluable resource for anyone studying chemistry conducting research or simply seeking to deepen their understanding of the fundamental building blocks of matter

The Periodic Table Eric R. Scerri, 2019-07-25 The periodic table of elements first encountered by many of us at school provides an arrangement of the chemical elements ordered by their atomic number electron configuration and recurring chemical properties and divided into periodic trends In this Very Short Introduction Eric R Scerri looks at the trends in properties of elements that led to the construction of the table and shows how the deeper meaning of the table's structure gradually became apparent with the development of atomic theory and in particular quantum mechanics which underlies the behaviour of all of the elements and their compounds This new edition publishing in the International Year of the Periodic Table celebrates the completion of the seventh period of the table with the ratification and naming of elements 113 115 117 and 118 as nihonium moscovium tennessine and oganesson Eric R Scerri also incorporates new material on recent advances in our understanding of the origin of the elements as well as developments concerning group three of the periodic table

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Chemical Elements Pocket Guide Coventry House Publishing, 2020-02-08 The Chemical Elements Pocket Guide serves as a portable reference for quick study and efficient review of the 118 elements on the periodic table This on the go resource details the physical and atomic properties of each element as well as their history and characteristics in bullet point format The book's small trim size 4 25 x 6 8 inches is intended to fit inside a lab coat pocket and the bound design means you no longer need to carry loose bulky flashcards that can be misplaced or destroyed Includes the updated names nihonium moscovium tennessine and oganesson for elements 113 115 117 and 118 respectively Information provided includes Atomic number Atomic symbol Element category Standard state Atomic mass Electron configuration Oxidation states Electronegativity Atomic radius Ionization energy Electron affinity Melting point Boiling point Density Year discovered Discovered by Appearance Natural occurrence Interesting fact

The Amazing World of the Atom and the Ultimate Periodic Table of the Elements Costel Rizescu, Mihaela Rizescu, 2018-05-24 This book is addressed to undergraduate and graduate students taking physics and chemistry courses at an introductory level STEM high school students and to more experienced professors and researchers who need to stay up to date with the most recent advances in data as well It is also beneficial to those involved in materials science medical physics biotechnology astronomy quantum chemistry Earth and space science and other related fields The volume consists of two parts the first part is devoted to the quantum mechanics theory of atomic structures as discovered and verified by physics whereas the second part presents and analyzes a large amount of the latest critically evaluated data for the properties of all elements on the periodic table of the elements Periodic trends for ionization energy electronegativity

atomic radius density and melting points are graphed and thoughtfully analyzed Additional data of ionic radius covalent radius van der Waals radius and 12 coordination atomic radius for almost all elements on the periodic table are also presented and evaluated The authors discussed over 30 problems review questions and their solutions to help deepen the insight in this subject area to make this book a real study text Plenty of problems are given to elucidate the material This book represents the culmination of the authors many years of research and teaching physics materials science and instrumentation It is also a crystallization of their passion and strong interest in the history of atomic physics and the philosophy of science in general From the beginning it was authors intention to include information in this book that is not easily located elsewhere or is not found completely in a single book or publication Thus while this book can be used as a text the authors hope that it will be used as a useful reference too Each chapter and sub chapter of this book capitalizes on the strengths comments feedback and criticism that the authors expect to have from students faculty and working professionals

The Periodic Table Eric R. Scerri, 2006-10-12 The periodic table is one of the most potent icons in science It lies at the core of chemistry and embodies the most fundamental principles of the field The one definitive text on the development of the periodic table by van Spronsen 1969 has been out of print for a considerable time The present book provides a successor to van Spronsen but goes further in giving an evaluation of the extent to which modern physics has or has not explained the periodic system The book is written in a lively style to appeal to experts and interested lay persons alike The Periodic Table begins with an overview of the importance of the periodic table and of the elements and it examines the manner in which the term element has been interpreted by chemists and philosophers The book then turns to a systematic account of the early developments that led to the classification of the elements including the work of Lavoisier Boyle and Dalton and Cannizzaro The precursors to the periodic system like D bereiner and Gmelin are discussed In chapter 3 the discovery of the periodic system by six independent scientists is examined in detail Two chapters are devoted to the discoveries of Mendeleev the leading discoverer including his predictions of new elements and his accommodation of already existing elements Chapters 6 and 7 consider the impact of physics including the discoveries of radioactivity and isotopy and successive theories of the electron including Bohr s quantum theoretical approach Chapter 8 discusses the response to the new physical theories by chemists such as Lewis and Bury who were able to draw on detailed chemical knowledge to correct some of the early electronic configurations published by Bohr and others Chapter 9 provides a critical analysis of the extent to which modern quantum mechanics is or is not able to explain the periodic system from first principles Finally chapter 10 considers the way that the elements evolved following the Big Bang and in the interior of stars The book closes with an examination of further chemical aspects including lesser known trends within the periodic system such as the knight s move relationship and secondary periodicity as well as attempts to explain such trends

Periodic Table & Periodic Properties M. Satake, 2010 The book is primarily meant for undergraduate students of chemistry General reader who is interested in chemistry of

elements and their behaviour will find it equally interesting and easy to understand

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