

# HISTORY OF THE ATOM

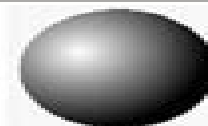
GENERAL CHEMISTRY 1

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MADE BY: ELLA SABIDO 11SP

## DEMOCRITUS (400 B.C.)

- formulated the term 'atom' and believed that matter can be broken down to its simplest and smallest substance called atom.



## ARISTOTLE (300 B.C. - 1800's)

- dismissed the idea of atoms and declared that all matter was made of only four elements: fire, air, water and earth.
- believed that there are only five elements that exist: fire, water, earth and air.



## DALTON (1803)

- he theorized that all matter is made of atoms. Atoms are too small to see, "uncuttable," and indestructible.
- developed the atomic theory: All atoms of a given element are exactly alike and atoms of different elements are different.



BILLIARD BALL ATOM

## THOMSON (1897)

- he discovered the presence of the electron.
- he proposed a model of the atom that is sometimes called the "Plum Pudding" model. His theory was that atoms are made from a positively charged substance with negatively charged electrons scattered about, like raisins in a pudding or chocolate chips in a cookie.



PLUM PUDDING

## RUTHERFORD (1908)

- he performed an experiment using positively charged particles fired at gold foil.
- he theorized that atoms have a small, dense, positively charged center, which he called the "nucleus".



NUCLEUS MODEL

## BOHR (1913)

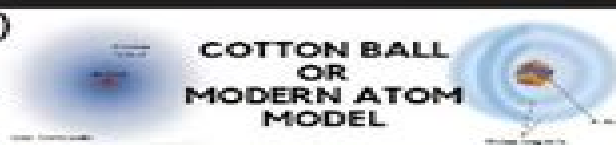
- he suggested that electrons orbit in different levels.
- he studied the structure of atoms based on Rutherford's discoveries.
- the more energy an atom gives off, the closer it is to the nucleus, the more it absorbs, the farther away.



BOHR MODEL OR THE QUANTUM MODEL

## MODERN CLOUD THEORY (20th Century)

- according to today's atomic theory, in the electron cloud, electrons whirl around the nucleus billions of times in one second. They are not moving around in random patterns; an electron's location depends upon how much energy the electron has.



COTTON BALL OR MODERN ATOM MODEL

# From Elements To Atoms A History Of Chemical Composition

**Ray Lester**



## **From Elements To Atoms A History Of Chemical Composition:**

From Elements to Atoms Robert Siegfried, 2002 Seeking to enlarge an understanding of the nature of chemical science references to recently published secondary works are intended for the benefit of readers who wish to enlarge their perspectives on the development of early chemical thinking

**From Elements to Atoms** Robert Siegfried, 2002

**Encyclopedia of Physical Organic Chemistry, 6 Volume Set** Zerong Wang, Uta Wille, Eusebio Juaristi, 2017-04-17 Winner of 2018 PROSE Award for MULTIVOLUME REFERENCE SCIENCE This encyclopedia offers a comprehensive and easy reference to physical organic chemistry POC methodology and techniques It puts POC a classical and fundamental discipline of chemistry into the context of modern and dynamic fields like biochemical processes materials science and molecular electronics Covers basic terms and theories into organic reactions and mechanisms molecular designs and syntheses tools and experimental techniques and applications and future directions Includes coverage of green chemistry and polymerization reactions Reviews different strategies for molecular design and synthesis of functional molecules Discusses computational methods software packages and more than 34 kinds of spectroscopies and techniques for studying structures and mechanisms Explores applications in areas from biology to materials science The Encyclopedia of Physical Organic Chemistry has won the 2018 PROSE Award for MULTIVOLUME REFERENCE SCIENCE The PROSE Awards recognize the best books journals and digital content produced by professional and scholarly publishers Submissions are reviewed by a panel of 18 judges that includes editors academics publishers and research librarians who evaluate each work for its contribution to professional and scholarly publishing You can find out more at [proseawards.com](http://proseawards.com) Also available as an online edition for your library for more details visit Wiley Online Library

**The Lost Elements** Marco Fontani, Mariagrazia Costa, Mary Virginia Orna, 2015 The story of the false entries good faith errors retractions and mistakes that occurred during the formation of the Periodic Table of Elements as we know it

A Cultural History of Chemistry in the Eighteenth Century Matthew Daniel Eddy, Ursula Klein, 2023-12-14 A Cultural History of Chemistry in the Eighteenth Century covers the period from 1700 to 1815 Setting the progress of science and technology in its cultural context the volume re examines the changes that many have considered to constitute a chemical revolution Already boasting a laboratory culture open to both manufacturing and commerce the discipline of chemistry now extended into academies and universities Chemists studied myriad materials derived from minerals plants and animals and produced an increasing number of chemical substances such as acids alkalis and gases New textbooks offered opportunities for classifying substances rethinking old theories and elaborating new ones By the end of the period in Europe and across the globe chemistry now embodied the promise of unifying practice and theory The 6 volume set of the Cultural History of Chemistry presents the first comprehensive history from the Bronze Age to today covering all forms and aspects of chemistry and its ever changing social context The themes covered in each volume are theory and concepts practice and experiment laboratories and technology culture and science

society and environment trade and industry learning and institutions art and representation Matthew Daniel Eddy is Professor and Chair in the History and Philosophy of Science at Durham University UK Ursula Klein is Senior Research Scholar at the Max Planck Institute for the History of Science Germany Volume 4 in the Cultural History of Chemistry set General Editors Peter J T Morris University College London UK and Alan Rocke Case Western Reserve University USA

**Chemistry, Pharmacy and Revolution in France, 1777-1809** Jonathan Simon, 2016-04-08 This book explores the history of pharmacy in France and its relationship to the discipline of chemistry as it emerged at the beginning of the nineteenth century It argues that an appreciation of the history of pharmacy is essential to a full understanding of the constitution of modern science in particular the discipline of chemistry As such it provides a novel interpretation of the chemical revolution c 1770 1789 that will no doubt generate much debate on the place of the chemical arts in this story a question that has hitherto lacked sufficient scholarly reflection Furthermore the book situates this analysis within the broader context of the French Revolution arguing that an intimate and direct link can be drawn between the political upheavals and our vision of the chemical revolution The story of the chemical revolution has usually been told by focusing on the small group of French chemists who championed Lavoisier's oxygen theory or else his opponents Such a perspective emphasises competing theories and interpretations of critical experiments but neglects the challenging issue of who could be understood as practising chemistry in the eighteenth century In contrast this study traces the tradition of pharmacy as a professional pursuit that relied on chemical techniques to prepare medicines and shows how one of the central elements of the chemical revolution was the more or less conscious disassociation of the new chemistry from this ancient chemical art

The Scientist's Atom and the Philosopher's Stone Alan Chalmers, 2009-06-04 Drawing on the results of his own scholarly research as well as that of others the author offers for the first time a comprehensive and documented history of theories of the atom from Democritus to the twentieth century This is not history for its own sake By critically reflecting on the various versions of atomic theories of the past the author is able to grapple with the question of what sets scientific knowledge apart from other kinds of knowledge philosophical knowledge in particular He thereby engages historically with issues concerning the nature and status of scientific knowledge that were dealt with in a more abstract way in his *What Is This Thing Called Science* a book that has been a standard text in philosophy of science for three decades and which is available in nineteen languages Speculations about the fundamental structure of matter from Democritus to the seventeenth century mechanical philosophers and beyond are construed as categorically distinct from atomic theories amenable to experimental investigation and support and as contributing little to the latter from a historical point of view The thesis will provoke historians and philosophers of science alike and will require a revision of a range of standard views in the history of science and philosophy The book is key reading for students and scholars in History and Philosophy of Science and will be instructive for and provide a challenge to philosophers historians and scientists more generally *New Narratives in Eighteenth-Century Chemistry*

Lawrence M. Principe, 2007-09-14 The eighteenth century has long been considered critical for the development of modern chemistry yet many crucial features of the period remain largely unknown or unexplored for general accounts often built around Lavoisier have remained quite selective This volume presents new approaches and topics in an attempt to build a richer fuller more complex view of chemical work during the period Themes include late phase alchemy professionalization chemical education and the links and relations between chemistry and pharmacy medicine agriculture and geology

**Traditions of Analysis and Synthesis** William R. Newman, Jutta Schickore, 2024-12-23 This open access book provides a fresh perspective on analysis and synthesis across several areas of inquiry The two operations form a primary basis of modern laboratory science ranging from the spectrographic analysis used in practically every scientific discipline today to the naming of entire disciplines such as synthetic organic chemistry Despite their acknowledged significance however the history of analysis synthesis and their relations over the longue dur e is poorly understood Several volumes have been devoted to the history of analysis and synthesis in the sense that premodern mathematicians and philosophers used the terms but very little work has been done on the tradition of material decomposition and recomposition and its relationship to mathematics and philosophy The present volume brings together scholars in the history of medicine mathematics philosophy chemistry and alchemy to explore the ways in which these multiple disciplines understood and used analysis and synthesis as experimental justificatory and conceptual tools

**Handbook of Potentiality** Kristina Engelhard, Michael Quante, 2018-04-18 This volume congregates articles of leading philosophers about potentials and potentiality in all areas of philosophy and the empirical sciences in which they play a relevant role It is the first encompassing collection of articles on the metaphysics of potentials and potentiality Potentials play an important role not only in our everyday understanding of objects persons and systems but also in the sciences An example is the potential to become an adult human person Moreover the attribution of potentials involves crucial ethical problems Bioethics makes references to the theoretical concept potential without being able to clarify its meaning However despite its relevance it has not been made subject of philosophical investigation Mostly potentials are regarded as a subspecies of dispositions Whilst dispositions are a flourishing field of research potentials as such have not come into focus Potentials like dispositions are modal properties But already a first glance at the metaphysics of potentials shows that concerning their ascription potentials are more problematic than dispositions since potential means that an entity has the potential to acquire a property in the future Therefore potentials involve a time structure of the entities in question that is much more complex than those of dispositions This handbook brings this important concept into focus in its various aspects for the first time It covers the history of the concept as well as contemporary systematic problems and will be of special interest for philosophers in the fields of general metaphysics philosophy of science and ethics especially bioethics It will also be of interest to scientists and persons concerned with bioethical problems

*Is Water H<sub>2</sub>O?* Hasok Chang, 2012-05-23 This book exhibits deep philosophical quandaries and

intricacies of the historical development of science lying behind a simple and fundamental item of common sense in modern science namely the composition of water as  $H_2O$  Three main phases of development are critically re examined covering the historical period from the 1760s to the 1860s the Chemical Revolution through which water first became recognized as a compound not an element early electrochemistry by which water's compound nature was confirmed and early atomic chemistry in which water started out as  $HO$  and became  $H_2O$  In each case the author concludes that the empirical evidence available at the time was not decisive in settling the central debates and therefore the consensus that was reached was unjustified or at least premature This leads to a significant re examination of the realism question in the philosophy of science and a unique new advocacy for pluralism in science Each chapter contains three layers allowing readers to follow various parts of the book at their chosen level of depth and detail The second major study in complementary science this book offers a rare combination of philosophy history and science in a bid to improve scientific knowledge through history and philosophy of science

*From Atoms to Atom* Andrew G. Van Melsen, 2004-01-01 This classic profiles the atom's progress from Grecian philosophy to physical conception in the 17th century and modern applications to quantum theory Fascinating Philosophy 1960 edition

*Philosophy of Chemistry* Andrea Woody, Robin Findlay Hendry, Paul Needham, 2012 Philosophy of Chemistry investigates the foundational concepts and methods of chemistry the science of the nature of substances and their transformations This groundbreaking collection the most thorough treatment of the philosophy of chemistry ever published brings together philosophers scientists and historians to map out the central topics in the field The 33 articles address the history of the philosophy of chemistry and the philosophical importance of some central figures in the history of chemistry the nature of chemical substances central chemical concepts and methods including the chemical bond the periodic table and reaction mechanisms and chemistry's relationship to other disciplines such as physics molecular biology pharmacy and chemical engineering This volume serves as a detailed introduction for those new to the field as well as a rich source of new insights and potential research agendas for those already engaged with the philosophy of chemistry Provides a bridge between philosophy and current scientific findings Encourages multi disciplinary dialogue Covers theory and applications

General and Inorganic Chemistry in Medicine Budin Michov, 2024-12-09 This book is intended for students in medicine pharmacy and dentistry physicians dentists pharmacists biochemists and more In General Chemistry the laws of chemistry the structure of simple and complex compounds chemical bonds solutions chemical reactions kinetics equilibrium thermodynamics protolytic and redox processes and sorption are discussed In Inorganic Chemistry chemical elements inorganic compounds and their significance for medicine are presented It is focused on developing metal based diagnostic and therapeutic agents The significance of coordination chemistry to modulate enzyme activity is discussed The production of reactive oxygen species selectively damaging cancer cells is described too Short biographies of chemists and scientists which have rendered services to general and inorganic chemistry in medicine are given in a person index

**Chemistry as a**

**Game of Molecular Construction** Sason Shaik, 2016-03-07 Chemistry as a Game of Molecular Construction The Bond Click Way utilizes an innovative and engaging approach to introduce students to the basic concepts and universal aspects of chemistry with an emphasis on molecules beauty and their importance in our lives Offers a unique approach that portrays chemistry as a window into mankind's material chemical essence Reveals the beauty of molecules through the click method a teaching methodology comprised of the process of constructing molecules from building blocks Styles molecular construction in a way that reveals the universal aspect of chemistry Allows students to construct molecules from the simple hydrogen molecule all the way to complex strands of DNA thereby showing the overarching unity of matter Provides problems sets and solutions for each chapter The New Walford Guide to Reference Resources Ray Lester, 2005 The New Walford highlights the best resources to use when undertaking a search for accurate and relevant information saving you precious time and effort For those looking for a selective and evaluative reference resource that really delivers on its promise look no further In addition to print sources The New Walford naturally covers an extensive range of reference sources such as digital databanks digital reference services electronic journal collections meta search engines networked information services open archives resource discovery services and websites of premier organizations in both the public and private sectors But rather than supplying a list of all available known resources as a web search engine might The New Walford subject specialists have carefully selected and evaluated available resources to provide a definitive list of the most appropriate and useful With an emphasis on quality and sustainability the subject specialists have been careful to assess the differing ways that information is framed and communicated in different subject areas As a result the resource evaluations in each subject area are prefaced by an introductory overview of the structure of the relevant literature This ensures that The New Walford is clear easy to use and intuitive Publisher Chemical Heritage, 2004 **The Interaction of Sciences in the Study of the Earth** D. I. Sheherbakov, V. V. Belousov, 2002 This book is a collection of articles on a variety of logically interlinked problems relating to the study of the earth and the evolution of the different sciences that engage in this study the geosciences as they are sometimes called the nature and place of modern geology among other sciences the tendencies in its development the specific features of the so called geological form of motion of matter and its connection with other forms of motion the place of geophysics and geochemistry in the study of the planet and in the system of sciences investigating the earth some philosophical aspects of the transformation of nature On a number of questions the authors express different points of view and the reader is able to judge for himself of the merits and demerits of their theories The volume will no doubt be of interest to geologists geophysicists geochemists geographers and philosophers to say nothing of the ever growing circle of inquisitive readers who take an interest in the exploration of our native planet and the philosophical and methodological questions deriving therefrom The papers were originally presented at joint theoretical conferences of philosophical methodological seminars scientific establishments of the U S S R Academy of Sciences The papers prepared for this collection were revised

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