The Elements has become an international sensation, with over one million copies in-print worldwide. The highly-anticipated paperback edition of The Elements is finally available. An eye-opening, original collection of gorgeous, never-before-seen photographic representations of the 118 elements in the periodic table. The elements are what we, and everything around us, are made of. But how many elements has anyone actually seen in pure, uncombined form? The Elements provides this rare opportunity. Based on seven years of research and photography, the pictures in this book make up the most complete, and visually arresting, representation available to the naked eye of every atom in the universe. Organized in order of appearance on the periodic table, each element is represented by a spread that includes a stunning, full-page, full-color photograph that most closely represents it in its purest form. For example, at -183°C, oxygen turns from a colorless gas to a beautiful pale blue liquid. Also included are fascinating facts, figures, and stories of the elements as well as data on the properties of each, including atomic weight, density, melting and boiling point, valence, electronegativity, and the year and location in which it was discovered. Several additional photographs show each element in a slightly altered form, as used in various practical ways. The elements' position on the periodic table is pinpointed on a mini rendering of the table and an illustrated scale of the element's boiling and/or melting points appears on each page along with a density scale that runs along the bottom. Packed with interesting information, this combination of solid science and stunning artistic photographs is the perfect gift book for every sentient creature in the universe. Includes a tear-out poster of Theodore Gray's iconic Photographic Periodic Table!Boron has all the best tunes. That may well be the first impression of the Group 13 elements. The chemical literature fosters the impression not only in the primary journals, but also in astdayoutflowbooks focussing more or less closely on boron and its compounds. The same preoccupation with boron is apparent in the coverage received by the Group 13 elements in the comprehensive and regularly updated volume of the Gmelin Handbook. Yet such an imbalance cannot be explained by any inherent lack of variety, interest or consequence in the 'heavier elements. Aluminium is the most abundant metal in the earth's crust; in the industrialised world the metal is second only to iron in its usage, and its compounds can justifiably be said to touch our lives daily - to the potential detriment of those and other lives, some would argue. From being chemical curios, gallium and indium have now gained considerably prominence as sources of compound semiconductors like gallium arsenide and indium antimonide. Nor is there any want of incident in the chemistry of the heavier Group 13 elements. In their redox, coordination and structural properties, there is to be found music indeed, notable not always for its harmony but invariably for its richness and variety. Thisbook seeks to redress the balance with a definitive, wide-ranging up-to-date review of the chemistry of the Group 13 metals aluminium, gallium, indium and thallium. Hypervalent Iodine Chemistry is the first comprehensive textbook covering all of the main aspects of the chemistry of organic and inorganic polyvalent iodine compounds, including applications in chemical research, medicine, and industry. Providing a comprehensive overview of the preparation, properties, and synthetic applications of this important class of reagents, the text is presented in the following way. The introductory chapter provides a background for the reader and describes the general classification of iodine compounds, nomenclature, hypervalent bonding, structural features, and the principles of reactivity of polyvalent iodine compounds. Chapter 2 gives a detailed description of the preparative methods and structural features of all known classes of organic and inorganic derivatives of polyvalentiodine. Chapter 3, the key chapter of the book, deals with many applications of hypervalent iodine reagents in organic synthesis. Chapter 4 describes the most recent achievements in hypervalent iodine catalysis. Chapter 5 deals with recyclable polymer-supported and nonpolymeric hypervalent iodine reagents. Chapter 6 covers the "green" reactions of hypervalent iodine reagents under solvent-free conditions or in aqueous solutions. The final chapter provides an overview of the important practical applications of polyvalent iodine compounds in medicine and industry. The book is aimed at all chemists interested in inorganic and industrial researchers inorganic, organic, physical, medicinal, and biological chemistry. It will be particularly useful to synthetic organic and inorganic chemists, including graduate and advanced undergraduate students. It comprehensively covers the green chemistry aspects of hypervalent iodine chemistry, making it especially useful for industrial chemists. Rudolph Mossbauer discovered the phenomenon of recoil-free nuclear resonance fluorescence in 1957-58 and the first indications of hyperfine interactions in a chemical compound were obtained by Kistner and Sunyar in 1960. From these beginnings the technique of Mossbauer spectroscopy rapidly emerged and the astonishing versatility of this new technique soon led to its extensive application to a wide variety of chemical and solid-state problems. This book reviews the results obtained by Mossbauer spectroscopy during the past ten years in the belief that this will provide a firm basis for the continued development and application of the technique to new problems in the future. It has been our aim to write a unified and consistent treatment which firstly presents the basic principles underlying the phenomena involved, then outlines the experimental techniques used, and finally summarises the wealth of experimental and theoretical results which have been obtained. We have tried to give some feeling for the physical basis of the Mossbauer effect with out extensive use of mathematical formalism, and some appreciation of the experimental methods employed without embarking on a detailed discussion of electronics and instrumentation. However, full references to the original literature are provided and particular points can readily be pursued in more detail if required. Written by Glenn T. Seaborg, Nobel Laureate and pre-eminent figure in the field, with the assistance of Walter D. Loveland, it covers all aspects of transuranium elements, including their discovery, chemical properties, nuclear properties, nuclear synthesis reactions, experimental techniques, natural occurrence, superheavy elements, and predictions for the future. Published on the fiftieth anniversary of the discovery of transuranium elements, it conveys the essence of the ideas and distinctive blend of theory and experiment that has marked their study. This is a handy textbook comprised of chapters introducing the fundamentals of chalcogen chemistry with a focus on the chalcogen and selected derived compounds and/or major elements. In addition to the halogen chemistry elements of Group 16 or group VI - in the modern periodic table include oxygen (O), sulfur (S), selenium (Se), tellurium (Te), and polonium (Po), and they exhibit extremely interesting properties. They are endowed with supramolecular and structure bonding reactivities that allow them to form a variety of new compounds with sophisticated characteristics, thus making their way into a new era of materials development. It is hoped that readers of this
textbook with a general background knowledge in chemistry, biochemistry, and related fields. This self-confessed introduction provides technical administrators and managers with a broad, practical overview of the subject and gives researchers working in different areas an appreciation of developments in nanotechnology outside their own fields of expertise. 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 a 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 that was the fundamental parameter sought - one of the most fundamental features of 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. When this innovative textbook first appeared in 1984 it rapidly became a great success throughout the world and has already been translated into several European and Asian languages. Now the authors have completely revised and updated the text, including more than 2000 new literature references to work published since the first edition. No page has been left unaltered but the novel features which proved so attractive have been retained. The book presents a balanced, coherent and comprehensive account of the chemistry of the elements for both undergraduate and postgraduate students. This crucial central area of chemistry is full of ingenious experiments, intriguing compounds and exciting new discoveries. The authors specifically avoid the term ‘inorganic chemistry’ since this evokes an outdated view of chemistry which is no longer appropriate in the final decade of the 20th century. Accordingly, the book covers not only the ‘inorganic’ chemistry of the elements, but also analytical, theoretical, industrial, organometallic, bio-inorganic and other cognate areas of chemistry. The authors have broken with recent tradition in the teaching of their subject and adopted a new and highly successful approach based on descriptive chemistry. The chemistry of the elements is still discussed within the context of an underlying theoretical framework, giving cohesion and structure to the text, but at all times the chemical facts are emphasized. Students are invited to enter the exciting world of chemical phenomena with a sound knowledge and understanding of the subject, to approach experimentation with an open mind, and to assess observations reliably. This is a book that students will find challenging in their formal education, but will keep for reference and philosophical enrichment for much of their lives. It is more extensive than competing titles. Pergamon Texts in Inorganic Chemistry, Volume 2: The Chemistry of Arsenic, Antimony and Bismuth focuses on the physical and chemical properties of arsenic, antimony, and bismuth. This book discusses the alloys and intermetallic compounds; general aspects of the chemistry of arsenic; salts of antimony and bismuth; and organometallic compounds. The complexes of Arsenic(V), Antimony(V), and Bismuth(V), and mixed-valent compounds and mechanisms of reoxidation reactions are also elaborated. This text describes the chemical and physical properties of compounds, such as hydrides EH3, halides EX3, oxides EX2O3, halides EX5, sulfides E2S5, oxides EXO5, and related oxycacids. This publication is intended for chemical engineering students and chemists researching on the characteristics of arsenic, antimony, and bismuth. You know that you need oxygen to breathe, that neon can glow and chrome shines? But did you know that your cell phone contains arsenic, your spectacles contain rhodium and that the tin pest is not a disease? And can you name just three researchers whom we have to thank for all these results? Here, Professor Quadbeck-Seeger, a long-serving member of the board at BASF, goes in search of these and other questions. Based on the periodic table, the key reference source for any natural scientist, he explains the criteria that define an element’s position in the table and are responsible for its particular characteristics. In a clear and concise manner, he describes for each element the story behind its chemical and physical properties as well as the background to its work in full color. The reader is treated to both beautiful descriptions and original practicality that is both only rarely read, but also a treasure trove of surprising facts. Ideally combined with the “Historical Periodic Table” poster, this book is aimed at younger audiences and is thus particularly suitable for schools, lectures and other courses. An account of the concepts and intellectual structure of classical thermodynamics that reveals the subject’s simplicity and coherence. Students of physics, chemistry, and engineering are taught classical thermodynamics through its methods—a “problems first” approach that neglects the subject’s concepts and intellectual structure. In Thermodynamic Weiriness, Don Lemons fills this gap, offering a nonmathematical account of the ideas of classical thermodynamics in all its non-Newtonian “weirdness.” By emphasizing the ideas and their relationships to the real world, Lemons reveals the simplicity and logical coherence that is both seldom appreciated and the rise and fall of ideas in such a way that the ideas that were abandoned illuminate the ideas that took their place. Selections from primary sources, including writings by Daniel Fahrenheit, Antoine Lavoisier, James Joule, and others, appear at the end of most chapters. Lemons covers the invention of temperature; heat as a form of motion or as a material fluid; Carnot’s analysis of heat engines; William Thomson (later Lord Kelvin) and his two definitions of absolute temperature; and energy as the mechanical equivalent of heat. He explains early versions of the first and second laws of thermodynamics; entropy and the law of entropy non-decrease; the intriguing views of Lord Kelvin and Rudolf Clausius on the fate of time’s arrow; the zeroth and third laws of thermodynamics; and Einstein’s assessment of classical thermodynamics as “the only physical theory of universal content which I am convinced will never be overthrown.” An introductory journey through the periodic table explains how every tangible object is comprised of the various elements, while chronicling the history of element discovery and explaining how elemental knowledge can be applied. The Chemistry of the Actinide and Transactinide Elements is a contemporary and definitive compilation of chemical properties of all of the actinide elements, especially of the technologically important elements uranium and plutonium, as well as the transactinide elements. In addition to the comprehensive treatment of the chemical properties of each element, ion, and compound from atomic number 89 (actinium) through to 109 (meitnerium), this multi-volume work has specialized and definitive chapters on electronic theory, optical and laser fluorescence spectroscopy, X-ray absorption spectroscopy, organoactinide chemistry, thermodynamics, magnetic properties, the metals, coordination chemistry, separations, and trace analysis. Several chapters deal with environmental science, safety handling, and biological interactions of the actinide elements. The Editors invited teams of authors, who are active practitioners and recognized experts in their specialty, to write each chapter and have endeavored to provide a balanced and insightful treatment of these fascinating elements at the frontier of the periodic table. Because the field has expanded with new spectroscopic techniques and environmental focus, the work encompasses five volumes, each groups chapters on related topics. All chapters represent the current state of research in the chemistry of these elements and related fields. Advanced Inorganic Chemistry Volume II is a concise book on basic concepts of inorganic chemistry. Beginning with Coordination Chemistry, it
presents a systematic treatment of all Transition and Inner-Transition chemical elements and their compounds according to the periodic table. Special topics such as Pollution and its adverse effects, chromatography, use of metal ions in biological systems, to name a few, are discussed to provide additional relevant information to the students. It primarily caters to the undergraduate courses (honours) offered in Indian universities. The main thrust of the book lies in its aspects of modern chemical education. The most important concept that this book aims to communicate is the relationship between atom and molecular structure and chemical reactions. The presentation of the topic has been developed to be in line with the principles of modern chemical education. The book is structured into three parts. The first part is an introduction to the world of chemistry. The second part is a comprehensive coverage of all aspects of chemistry, and the third part is a collection of articles on current research topics in chemistry.

The book contains several features that make it an ideal textbook for students. It includes numerous examples, exercises, and problems, all of which are designed to help students develop a strong understanding of the subject matter. The book also features a wide range of diagrams and illustrations, which help to clarify complex concepts. Additionally, the book is well-organized and easy to follow, making it an excellent resource for both undergraduate and graduate students. Overall, this book is an excellent choice for anyone looking for a comprehensive and accessible introduction to the field of chemistry.
Chemistry of Transition Series * Stereochemical Activity of Lone Pairs in Heavier Main Group Element Compounds * How Close to Close Packing? * Forty-Five Years of Praseodymium Diiodide * Centered Zirconium Clusters * Titanium Nitride Oxochlorides * Trinuclear Molybdenum and Tungsten Cluster Chalcogenides * Current State of (B,C,N)-Compounds of Calcium and Lanthanum * Terbium and Thorium with Main Group Elements * Group and Late-Transition-Element Properties in Intermetallics * Ternary and Quaternary Niobium Arsenide Zintl Phases * The Building Block Approach to Understanding Main-Group-Metal Complex Structures * Cation-Deficient Quaternary Thiophosphates * A New Class of Hybrid Materials via Salt Inclusion Synthesis * Layered Perrenate and Vanadate Hybrid Solids * Hydrogen Bonding in Metal Halides * Syntheses and Catalytic Properties of Titanium Nitride Nanoparticles * Solventless Thermolysis * New Potential Scintillation Materials in Borophosphate Systems. The exceptional quality of previous editions has been built up to make this new edition of Atkins' Physical Chemistry even more closely suited to the needs of both lecturers and students. Re-organised into discrete 'topics', the text is more flexible to teach from and more readable for students. Now in its eleventh edition, the text has been enhanced with additional learning features and maths support to demonstrate the absolute centrality of mathematics to physical chemistry. Increasing the digestibility of the text in this new approach, the reader is brought to a question, then the math is used to show how it can be answered and progress made. The expanded and redistributed maths support also includes new 'Chemist's toolkits' which provide students with succinct reminders of mathematical concepts and techniques right where they need them. Checklists of key concepts at the end of each topic add to the extensive learning support provided throughout the book, to reinforce the main take-home messages in each section. The coupling of the broad coverage of the subject with a structure and use of pedagogy that is even more innovative will ensure Atkins' Physical Chemistry remains the textbook of choice for studying physical chemistry.

Inorganic and Bio-Inorganic Chemistry is the component of Encyclopedia of Chemical Sciences, Engineering and Technology Resources in the global Encyclopedia of Life Support Systems (EOLSS), which is an integrated compendium of twenty one Encyclopedias. The Theme on Inorganic and Bio-Inorganic Chemistry in the Encyclopedia of Chemical Sciences, Engineering and Technology Resources deals with the discipline which studies the chemistry of the elements of the periodic table. It covers the following topics: From simple to complex compounds; Chemistry of metals; Inorganic synthesis; Radicals reactions with metal complexes in aqueous solutions; Magnetic and optical properties; Inorganometallic chemistry; High temperature materials and solid state chemistry; Inorganic biochemistry; Inorganic reaction mechanisms; Homogeneous and heterogeneous catalysis; Cluster and polynuclear compounds; Structure and bonding in inorganic chemistry; Synthesis and spectroscopy of transition metal complexes; Nanosystems; Computed inorganic chemistry: Energy and inorganic chemistry. These two volumes are aimed at the following five major target audiences: University and College students Educators, Professional practitioners, Research personnel and Policy analysts, managers, and decision makers and NGOs an enchanting biography of the most resonant—and most necessary—chemical element on Earth. Carbon is everywhere: in this paper of this book and our body. It’s with us from beginning to end, in our baby clothes and coffin alike. We live on a carbon planet, and we are carbon life. No other element is so central to our well-being: yet, when missing or misaligned, carbon atoms can also bring about disease and even death. At one level, carbon seems so mysterious, complex, yet so fundamental that it will ultimately be found everywhere and in everything. We are doing chemistry! So why do so many of us consider a new or updated product. See how chemistry works in everything from soaps to medicines to petroleum. We’re all natural-born chemists. Every time we cook, clean, take a shower, drive a car, use a solvent (such as nail polish remover), or perform any of the countless everyday activities that involve any of the chemical reactions, we’re doing chemistry! So why do so many of us desperately resist learning chemistry when we’re young? Now there’s a fun, easy way to learn basic chemistry. Whether you’re studying chemistry in school and you’re looking for a little help making sense of what’s being taught in class, or you’re just into learning new things, Chemistry For Dummies gets you up to speed with all the basics of matter and energy, atoms and molecules, acids and bases, and much more! Tracks a typical chemistry course, giving you step-by-step lessons you can easily grasp Packed with basic chemistry principles and time-saving tips from chemistry professors Real-world examples provide everyday context for complicated topics Full of relevant examples and updated to mirror current teaching methods and classroom protocols, Chemistry For Dummies puts you on the fast-track to mastering chemistry. If you’re looking for a history of scientific discoveries about the birth of the universe, Readers experience for themselves how the coloring of a carefully designed picture almost magically creates understanding. Indispensable for every biology student.