

# Inorganic Chemistry Madan Malik Tuli

This book is primarily intended for the first year B.Tech students of all branches for their course on engineering chemistry. The main objective of this book is to provide a broad understanding of the chemical concepts, theories and principles of Engineering Chemistry in a clear and concise manner, so that even an average student can grasp the intricacies of the subject. It includes the general concepts of structure and bonding, phase rule, solid state, reaction kinetics and catalysis, electrochemistry, chemical thermodynamics and free energy. Besides, the book introduces topics of applied chemistry like water technology, polymer chemistry and nanotechnology. Each theoretical concept is well supported by illustrative examples. The book also provides a large number of solved problems and illustrations to reinforce the theoretical understanding of concepts. **KEY FEATURES** (i) Each chapter of the book provides a clear and easy understanding of the definitions, theories and principles. (ii) A large number of well-labelled diagrams help to understand the concepts easily and clearly. (iii) Chapter-wise glossary and important mathematical relations are given for quick revision. (iv) Provides multiple choice questions with answers,

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short questions and long questions for practice. Pratiyogita Darpan (monthly magazine) is India's largest read General Knowledge and Current Affairs Magazine. Pratiyogita Darpan (English monthly magazine) is known for quality content on General Knowledge and Current Affairs. Topics ranging from national and international news/ issues, personality development, interviews of examination toppers, articles/ write-up on topics like career, economy, history, public administration, geography, polity, social, environment, scientific, legal etc, solved papers of various examinations, Essay and debate contest, Quiz and knowledge testing features are covered every month in this magazine.

In this book on quantitative analysis and reagent preparation, the authors adopt a novel approach-all the preparations have been given in the form of organic reactions in alphabetical order, with their respective reaction mechanisms. The procedures of some preparations are also discussed. Estimation of various compounds and functional groups is also included. A complete is devoted to chromatography, with exercises.

Selected Topics in Inorganic Chemistry S. Chand Publishing

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),

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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; Computational 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

Carefully researched by the authors to bring the subject of chemistry up-to-date, this text provides complete coverage of the new A- and AS-level core specifications. The inclusion of objectives and questions make it suitable for self study.

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The 7th Edition of Gary Christian's Analytical Chemistry focuses on more in-depth coverage and information about Quantitative Analysis (aka Analytical Chemistry) and related fields. The content builds upon previous editions with more enhanced content that deals with principles and techniques of quantitative analysis with more examples of analytical techniques drawn from areas such as clinical chemistry, life sciences, air and water pollution, and industrial analyses.

Selected Topics in Inorganic Chemistry is a comprehensive textbook discussing theoretical aspects of Inorganic Chemistry. Uniqueness of the book lies in treatment of all fundamental concepts, such as, Structure of Atom, Chemical Bonding, Inner Transition Elements and Coordination Chemistry, with a modern approach. Illustration of text with relevant line diagrams and tabular presentation of data makes understanding of concepts lucid and simple. The book is designed for B.Sc. (Honours) and M.Sc. students.

An advanced-level textbook of inorganic chemistry for the graduate (B.Sc) and postgraduate (M.Sc) students of Indian and foreign universities. This book is a part of four volume series, entitled "A Textbook of Inorganic Chemistry – Volume I, II, III, IV".

**CONTENTS:** Chapter 1. Stereochemistry and Bonding in Main Group Compounds: VSEPR theory,  $d^2 - p^2$  bonds, Bent rule and energetic of

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hybridization. Chapter 2. Metal-Ligand Equilibria in Solution: Stepwise and overall formation constants and their interactions, Trends in stepwise constants, Factors affecting stability of metal complexes with reference to the nature of metal ion and ligand, Chelate effect and its thermodynamic origin, Determination of binary formation constants by pH-metry and spectrophotometry. Chapter 3. Reaction Mechanism of Transition Metal Complexes – I: Inert and labile complexes, Mechanisms for ligand replacement reactions, Formation of complexes from aquo ions, Ligand displacement reactions in octahedral complexes- acid hydrolysis, Base hydrolysis, Racemization of tris chelate complexes, Electrophilic attack on ligands. Chapter 4. Reaction Mechanism of Transition Metal Complexes – II: Mechanism of ligand displacement reactions in square planar complexes, The trans effect, Theories of trans effect, Mechanism of electron transfer reactions – types; Outer sphere electron transfer mechanism and inner sphere electron transfer mechanism, Electron exchange. Chapter 5. Isopoly and Heteropoly Acids and Salts: Isopoly and Heteropoly acids and salts of Mo and W: structures of isopoly and heteropoly anions. Chapter 6. Crystal Structures: Structures of some binary and ternary compounds such as fluorite, antiferite, rutile, antirutile, cristobalite, layer lattices-  $CdI_2$ ,  $BiI_3$ ;  $ReO_3$ ,  $Mn_2O_3$ , corundum, perovskite, Ilmenite and

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Calcite. Chapter 7. Metal-Ligand Bonding: Limitation of crystal field theory, Molecular orbital theory, octahedral, tetrahedral or square planar complexes,  $\pi$ -bonding and molecular orbital theory. Chapter 8. Electronic Spectra of Transition Metal Complexes: Spectroscopic ground states, Correlation and spin-orbit coupling in free ions for 1st series of transition metals, Orgel and Tanabe-Sugano diagrams for transition metal complexes (d1 – d9 states), Calculation of  $Dq$ ,  $B$  and  $\beta$  parameters, Effect of distortion on the d-orbital energy levels, Structural evidence from electronic spectrum, John-Teller effect, Spectrochemical and nephelauxetic series, Charge transfer spectra, Electronic spectra of molecular addition compounds. Chapter 9. Magnetic Properties of Transition Metal Complexes: Elementary theory of magneto - chemistry, Guoy's method for determination of magnetic susceptibility, Calculation of magnetic moments, Magnetic properties of free ions, Orbital contribution, effect of ligand-field, Application of magneto-chemistry in structure determination, Magnetic exchange coupling and spin state cross over. Chapter 10. Metal Clusters: Structure and bonding in higher boranes, Wade's rules, Carboranes, Metal Carbonyl Clusters - Low Nuclearity Carbonyl Clusters, Total Electron Count (TEC). Chapter 11. Metal- $\pi$  Complexes: Metal carbonyls, structure and bonding, Vibrational spectra of metal carbonyls for bonding and structure

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elucidation, Important reactions of metal carbonyls; Preparation, bonding, structure and important reactions of transition metal nitrosyl, dinitrogen and dioxygen complexes; Tertiary phosphine as ligand. The First Edition Of This Book Was Brought Out By Wiley Eastern Ltd. In 1994. The Sixth Edition Now At Your Hand Differs From The First Edition In Many Respects. Many-Sided Changes Both Qualitatively And Quantitatively Are The Quotable Features Of This Edition. The Purpose Of This Edition Is Not Only To Initiate The Beginners Into This Fascinating Subject, But Also To Prepare Them In This Area For The Postgraduate Examinations Conducted By Universities Spread All Over The Country. Reading This Text Book In Depth Rather Than A Casual, Go-Through May Improve The Workaholic Culture Of The Students Desiring Higher Education At IITs And Highly Graded Universities Through Gate. The Same Yardstick Is Adoptable By The Postgraduate Students In Physics And Engineering Streams Aiming To Score High Grades In The Written Tests Conducted By UPSC For Class I Posts In Various Central Government Departments And Boards. Essentials of Physical Chemistry is a classic textbook on the subject explaining fundamentals concepts with discussions, illustrations and exercises. With clear explanation, systematic presentation, and scientific accuracy, the book not only helps the students clear misconceptions about

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the basic concepts but also enhances students' ability to analyse and systematically solve problems. This bestseller is primarily designed for B.Sc. students and would equally be useful for the aspirants of medical and engineering entrance examinations.

This book entitled "Inorganic Chemistry-II", is an effort to present the subject matter in a comprehensible and easily understandable form. This textbook is purposefully prepared for the postgraduate Inorganic Chemistry second semester course and it covers all the topics recommended. Written primarily to meet the requirements of students at the undergraduate level, this book aims for a self-learning approach. The fundamentals of physical chemistry have been explained with illustrations, diagrams, tables, experimental techniques and solved problems.

Organic chemistry has played a vital role in the development of diverse molecules which are used in medicines, agrochemicals and polymers. Most of the chemicals are produced on an industrial scale. The industrial houses adopt a synthesis for a particular molecule which should be cost-effective. No attention is paid to avoid the release of harmful chemicals in the atmosphere, land and sea. During the past decade special emphasis has been made towards green synthesis which circumvents the above problems. Prof. V. K. Ahluwalia and Dr. M.

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Kidwai have made a sincere effort in this direction. This book discusses the basic principles of green chemistry incorporating the use of green reagents, green catalysts, phase transfer catalysis, green synthesis using microwaves, ultrasound and biocatalysis in detail. Special emphasis is given to liquid phase reactions and organic synthesis in the solid phase. I must congratulate both the authors for their pioneering efforts to write this book. Careful selection of various topics in the book will serve the rightful purpose for the chemistry community and the industrial houses at all levels. PROF. JAVED IQBAL, PhD, FNA Distinguished Research Scientist & Head Discovery Research Dr. Reddy's Laboratories Ltd. Of the five major sociologists whose views on Indian society are assessed in this work, originally published in 1979, Marx and Weber made a special study of the subject and had something definite to say about the future of Indian society. Herbert Spencer was primarily concerned with the effects of colonial rule on India's progress, while Durkheim and Pareto tended to observe Indian society from a comparative point of view. However, as this study shows, all five sociologists touched on two special aspects of Indian society – Indian religion and the caste system. The other features of Indian society which they discussed in their various writings range widely from marriage and family structure, through village communities and the social structure of cities,

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to political organization, the educational system, economic conditions, and the future progress of Indian society. Dr Madan demonstrates the correctness of Marx's contention that the political subordination of India was the one great hindrance to the future progress of Indian Society. He points out, though, that Marx failed to see clearly the effects of the caste system on economic development, and shows that this aspect was more correctly assessed by Max Weber. On the other hand, in Dr Madan's view, Weber's observation that Indian religion was 'other-worldly' and therefore a great obstacle to progress in Indian society lacked incisiveness. By focusing on a neglected aspect of the writings of five of the great figures in sociology, the book gives a new insight into their work, and at the same time highlights many hitherto unrecognized facets of India's complex social structure.

Advanced Inorganic Chemistry - Volume I is a concise book on basic concepts of inorganic chemistry. It acquaints the students with the basic principles of chemistry and further dwells into the chemistry of main group elements and their compounds. It primarily caters to the undergraduate courses (Pass and Honours) offered in Indian universities.

A Textbook for B.Sc. (Part III and Hons.) and Postgraduate Courses of Indian Universities. In this edition, I have made major changes in the light of

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modern concepts introduced in syllabi at the undergraduate and postgraduate level as well. With matter has also been updated. The subject matter has been arranged systematically, in a lucid style and simple language. New Problems and exercises have also been introduced to acquaint the students with trend of questions they expect in the examinations.

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Explanation of concepts though numerous stepwise solved and ample unsolved problems for practice."--Back cover.

In the current era of incessant developing needs for the betterment and ease in living style for humans, technology is seeking upgraded, well structured materials for utilization in various fields of human-wellness such as medication, energy, environment protection and cleaning, food security etc. In the same direction, chemists are doing very well at synthesizing

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compounds and materials from different groups of chemicals. Among them, coordination compounds also play a key role in serving humanity as these compounds have a wide range of applications in health care from antimicrobial to anticancer, bioengineering, bio-mimetic models, catalysis, photosensitized materials etc. Along with development of stable coordination compounds, their extensive structural studies are also in the main line of work for researchers. Twenty-nine authors from different countries have contributed their scientific views and work in magnifying the importance and scope of coordination compounds in the present book entitled "Stability and Applications of Coordination Compounds". I hope that the book will achieve its target of supplementing the community of researchers and readers working in the field of coordination chemistry. A textbook for B.Sc Classes as per the UGC Model Syllabus. The book is visually beautiful and authors communicate their enthusiasm and enjoyment of the subject in every chapter. This textbook is currently in use at hundreds of colleges and universities throughout the country and is a national best-seller. There are hundreds of computer-generated coloured diagrams, graphs, photos and tables .

Organic Chemistry is primarily intended for the third year students pursuing B.Sc Chemistry (Honours) at the University of Calcutta and other major universities across eastern India. It offers 'learning by practice' approach and provides an up-to-date and comprehensive account of the subject matter.

The book has been written in simple language to help

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self study. The concepts have been explained with the help of equations and diagrams. The diagrams have been nicely labeled for clear understanding. Numerical examples have been solved with systematic steps. Solved and unsolved problems have been included. Experiments prescribed for engineering chemistry course have been included. theory and principle of each experiment have been explained in detail. Experimental producers have been written in an step wise manner. Viva voice has been discussed at the end of each experiment. Important points have been emboldened. For B.Sc 2nd year students of all Indian Universities. The book has been prepared keeping view the syllabi prepared by different universities on the basis of Model UGC Curriculum. A large number of illustrations, pictures and interesting examples have been provided to make the reading interesting and understandable. The question that have been provided in the Exercise are in tune with the latest pattern of examination.

For B.Sc. Part I,II & III Classes of all Indian Universities and also covering U.G.C. model curriculum. Authenticate, simple, to the point and modern account of each and every topic. Relevant, Clear, well labelled diagrams. Easy to understand treatment of most difficult and intricate topic.

Questions from university papers of various Indian Universities

Coverage of Physical Chemistry. Each volume

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includes a large number of illustrative numericals and typical problems to highlight the principles involved. IUPAC recommendations and SI units have been adopted throughout. The present book describes Wave Mechanics, Energy Quantization and Atomic Structure, Theories of Covalent Bond, Electrical and Magnetic Properties of Molecules, Molecular Spectroscopy, Molecular Symmetry and its Applications. Salient Features: • Comprehensive coverage of wave mechanics, energy quantization and atomic structure, theories of covalent bond, electrical and magnetic properties of molecules, molecular spectroscopy, molecular symmetry and its applications • Emphasis given to applications and principles • Explanation of equations in the form of solved problems and numericals • IUPAC recommendations and SI units have been adopted throughout • Rich and illustrious pedagogy

Primarily intended for the undergraduate students of science, the book deals with the practical aspects of organic chemistry and discusses how experiments should be done in the laboratory. The book introduces the various types of components used in laboratories and describes basic techniques used for purification. It elaborates different methods of identification of organic compounds, their preparation, and analysis. In addition, it emphasizes qualitative analysis of organic compounds. The book contains essential experiments done in an organic

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lab and also explains the theoretical background of reactions involved. This book is an attempt to provide students with the often used methods in an easy to understand manner, including explanations of theory, procedures and interpretations of results of the experiments. Besides undergraduate students of science, this book is also useful for the postgraduate students of chemistry. KEY FEATURES : Includes reaction mechanism of each reaction Describes in Appendices safety measures to be taken in laboratory and how to prepare chemical reagents Contains self assessment questions at the end of each chapter.

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 (Pass and Honours) offered in Indian universities.

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