

# Mathematical Methods In Chemical Engineering

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a working definition of the discipline of chemical ecology might be the study of the structure function origin and significance of naturally occurring compounds that

mediate inter and intraspecific interactions between organisms in particular chemical ecology focuses on determining the role of semiochemicals and related compounds in their natural contexts thus chemical ecology is distinct from disciplines such as pharmacology in which compounds are screened for uses outside their natural context for example in the screening of natural products for use as drugs superficially many of the methods used in the various branches of natural products chemistry such as pharmacology and chemical ecology are very similar but each branch has developed its own set of specialized methods for dealing with the problems characteristic of that discipline for example in chemical ecology many semiochemicals are isolated and identified using only a few micrograms or less of material although the same general chromatographic and spectroscopic techniques are used as would be used with the identification of most organic compounds specialized techniques have been developed for handling these very small quantities allowing the maximum amount of information to be recovered from the minimum amount of sample these micro scale techniques and the problems unique to working with very small amounts of sample are rarely covered in detail in reference books on the isolation and identification of biologically active natural chemicals

chemical analysis moves from laboratory to places where samples to be analysed are located this trend is aptly termed on site analysis as the dictum says from sample transfer to information transfer owing to the ever increasing number of samples to be analysed preliminary screening and selection of samples seems to be necessary even in the laboratory rapid test methods of chemical analysis can solve both these tasks this book is devoted to test methods that are widely used in environmental industrial clinical forensic medical and other areas allowing a rapid simple and cost effective analysis qualitative semi quantitative and quantitative to be performed by trained as well as non trained personnel some general characteristic features of test methods and test systems are described in the book e g definitions advantages and limitations chemical and physical principles of operation procedures and protocols and methodological aspects application of test methods in various areas is extensively overviewed and the test means and test tools pertinent for solving each concrete analytical task are discussed e g paper strips indicator powders and tubes tablets etc the most important applications of test methods evidently are testing for inorganic and organic components in water mostly for purposes of environmental control monitoring of toxic gases and alcohol vapours detection of narcotics and explosives determination of glucose cholesterol and other components of medical importance

drugs and pharmaceutical industry plays a vital role in the economic development of a nation it is one of the largest and most advanced sectors in the world acting as a

source for various drugs medicines and their intermediates as well as other pharmaceutical formulations india has come a long way in this field from a country importing more than 95 of its requirement of drugs and pharmaceuticals india now is exporting it even to developed countries being the intense knowledge driven industry it offers innumerable business opportunities for the investors corporate the world over the existence of well defined and strong pharmaceutical industry is important for promoting and sustaining research and developmental efforts and initiatives in an economy as well as making available the quality medicines to all at affordable prices that is it is essential to improve the health status of the individuals as well as the society as a whole so that positive contributions could be made to the economic growth and regional development of a country on the global platform india holds fourth position in terms of volume and thirteenth position in terms of value of production in pharmaceuticals the pharmaceutical industry has been producing bulk drugs belonging to all major therapeutic groups requiring complicated manufacturing processes as well as a wide range of pharmaceutical machinery and equipments the modern indian pharmaceutical industry is recent and its foundation was laid in the beginning of the current century the pharmaceutical industry can be broadly categorised as bulk drugs formulations iv fluids and pharmaceutical aids such as medical equipment hospital disposables capsules etc special feature of the pharmaceutical industry is a large number of manufacturers in the small scale sector the government is also encouraging the ssi sector providing some incentives the recent developments in the technology and r d work in this field have led to the increased growth rate of industries and have established indian pharmaceutical industries in the international market the content of the book includes information about properties general methods of analysis methods of manufacture of different types of drugs and pharmaceuticals some of the fundamentals of the book are polymeric materials used in drug delivery systems theoretical aspects of friction and lubrication a convenient method for conversion of quinine to quinidine formulation and evaluation of bio available enteric coated erythromycin and metronidazole tablets extraction of virginiamycin antipyretics and analgesics column chromatographic assay of aspirin tablets differentiating titration of phenacetin and caffeine infrared spectra of some compounds of pharmaceutical interest etc this book covers an intensive study on manufacturing production formulation and quality control of drugs and pharmaceuticals with technology involved in it this book is an invaluable resource for technologists professionals and those who want to venture in this field tags pharmaceutical technology books essentials of pharmaceutical technology pharmaceutical technology pharmaceutical books science technology medicine books drugs technology books drug and pharmaceuticals technology book best small

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part of the series new concepts in polymer science this volume contains information

on the main theoretical and practical problems involved in radiation chemistry of polymers the processes of polymerization and modification of polymers by grafting crosslinking and degradation induced by ionizing radiation are all described as well as the radiation resistance of polymers and their protection from radiation the book also contains applications of radiation chemistry of polymers such as principles of selection of radiation chemical processes for industrial use choice of radiation sources for specific processes modification of textile and film materials by grafting manufacturing of heat shrinkable thermostable and mechanically strong polymer products composites rubber vulcanizates and self adhesive products paints and coatings man made fibres materials for microelectronics and polymer materials for medical purposes

this book helps chemical and other engineers develop their skills for solving mathematical models using maple these mathematical models can consist of systems of algebraic ordinary and partial differential equations maple's dsolve is used to obtain solutions for many of these models maple worksheets are provided on the springer website for use by readers to solve the example problems in this book just click on electronic supplementary material and insert the isbn

emphasizing new technologies that produce clean water and energy from the wastewater treatment process this book presents recent advancements in wastewater treatment by various technologies such as chemical methods biochemical methods membrane separation techniques and nanotechnology it addresses sustainable water reclamation biomembrane treatment processes advanced oxidation processes and applications of nanotechnology for wastewater treatment it also includes integrated cost based design methodologies equations figures photographs and tables are included within the chapters to aid reader comprehension case studies and examples are included as well

statistical experimental design is currently used as a quality control technique to achieve product excellence at the lowest overall cost it can also function as a powerful tool to optimize food products and or processes to accelerate food development cycles reduce research costs facilitate the transition of products from research and development to manufacturing and troubleshoot manufacturing problems food product design a computer aided statistical approach familiarizes readers with the methodology of statistical experimental design and its application in food product design with the aid of commonly available modern commercial software food product design presents basic concepts of food product design then focuses on the most effective statistical techniques and corresponding computer applications for trial

design modeling and experimental data analysis the book presents very few theories about mathematics and statistics instead it contains detailed descriptions of how to use popular computer software to solve the real mathematical and statistical problems that occur in product design even those with very limited knowledge of statistics and mathematics will find this a useful and highly practical book food product design a computer aided statistical approach will be a valuable tool for professional food engineers technologists scientists and industrial personnel who want to update and expand their knowledge about computer aided statistical methods in the field of food product design those involved in applied research at universities in food and agriculture biological and chemical engineering and statistics will also find it useful and informative

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