

# Mathematical Modelling and Simulation in Chemical Engineering

M. Chidambaram

# Chemical Engineering Modelling Simulation And Similitude

**Xiaolong Qi**



## **Chemical Engineering Modelling Simulation And Similitude:**

**Chemical Engineering** Tanase Gh. Dobre, José G. Sanchez Marcano, 2007-06-18 A description of the use of computer aided modeling and simulation in the development integration and optimization of industrial processes The two authors elucidate the entire procedure step by step from basic mathematical modeling to result interpretation and full scale process performance analysis They further demonstrate similitude comparisons of experimental results from different systems as a tool for broadening the applicability of the calculation methods Throughout the book adopts a very practical approach addressing actual problems and projects likely to be encountered by the reader as well as fundamentals and solution strategies for complex problems It is thus equally useful for student and professional engineers and chemists involved in industrial process and production plant design construction or upgrading

**Confectionery and Chocolate Engineering** Ferenc A. Mohos, 2010-11-29 Confectionery and chocolate manufacture has been dominated by large scale industrial processing for several decades It is often the case though that a trial and error approach is applied to the development of new products and processes rather than verified scientific principles The purpose of this book is to describe the features of unit operations used in confectionary manufacturing In contrast to the common technology focused approach to this subject this volume offers a scientific theoretical account of confectionery manufacture building on the scientific background of chemical engineering The large diversity of both raw materials and end products in the confectionery industry makes it beneficial to approach the subject in this way The industry deals with a variety of vegetable based raw materials as well as milk products eggs gelatin and other animal based raw materials A study of confectionery and chocolate engineering must therefore examine the physical and chemical as well as the biochemical and microbiological properties of the processed materials By characterizing the unit operations of confectionery manufacture the author who has over 40 years experience in confectionery manufacture aims to open up new possibilities for improvement relating to increased efficiency of operations the use of new materials and new applications for traditional raw materials The book is aimed at food engineers scientists technologists in research and industry as well as graduate students on relevant food and chemical engineering related courses

**Integrated Chemical Processes** Kai Sundmacher, Achim Kienle, Andreas Seidel-Morgenstern, 2006-03-06 This is the first book dedicated to the entire field of integrated chemical processes covering process design analysis operation and control of these processes Both the editors and authors are internationally recognized experts from different fields in industry and academia and their contributions describe all aspects of intelligent integrations of chemical reactions and physical unit operations such as heat exchange separational operations and mechanical unit operations As a unique feature the book also introduces new concepts for treating different integration concepts on a generalized basis Of great value to a broad audience of researchers and engineers from industry and academia

*Chemical Engineering Dynamics, Includes CD-ROM* John Ingham, 2007 In this book the modelling of dynamic chemical engineering processes is presented in a highly

understandable way using the unique combination of simplified fundamental theory and direct hands on computer simulation The mathematics is kept to a minimum and yet the nearly 100 examples supplied on www.wiley.vch.de illustrate almost every aspect of chemical engineering science Each example is described in detail including the model equations They are written in the modern user friendly simulation language Berkeley Madonna which can be run on both Windows PC and Power Macintosh computers Madonna solves models comprising many ordinary differential equations using very simple programming including arrays It is so powerful that the model parameters may be defined as sliders which allow the effect of their change on the model behavior to be seen almost immediately Data may be included for curve fitting and sensitivity or multiple runs may be performed The results can be seen simultaneously on multiple graph windows or by using overlays The resultant learning effect of this is tremendous The examples can be varied to fit any real situation and the suggested exercises provide practical guidance The extensive experience of the authors both in university teaching and international courses is reflected in this well balanced presentation which is suitable for the teacher the student the chemist or the engineer This book provides a greater understanding of the formulation and use of mass and energy balances for chemical engineering in a most stimulating manner This book is a third edition which also includes biological environmental and food process examples *Oil Refineries in the 21st Century* Ozren Ocic, 2008-07-15 A very detailed workable approach to improving energy efficiency and cost effectiveness in petroleum processing dealing with the role of management and refinery operators in achieving the best technological parameters the most rational utilization of energy as well as the greatest possible economic success The author provides a detailed and well founded approach to the methodology information and criteria necessary for analyzing energy use economics and the environmental impact as well as solutions for fulfilling the requirements of the Kyoto agreement In addition he describes in sufficient detail the energy streams within a refinery A practical guide for refinery engineers managers and consultants as well as all engineers involved in the design of process technologies in developed as well as developing countries **Macromolecular Chemistry and Physics**, 2006

**Innovative Materials for Energy and Sustainability** Carlton A. Taft, **Separations Chemistry** Fedor Macáček, James D. Navratil, 2016-06-06 Separation of chemical species is a gate to final success of synthesis and preparation of compounds in pure and defined state Variability of natural and artificial mixtures to be treated is enormous Task of chemistry is to separate components of homogeneous mixtures the gaseous and liquid solutions The book concentrates on understanding the basic philosophies of both equilibrium and nonequilibrium chemical thermodynamics and engineering performance that lay in principle of separation technique such as distillation crystallization centrifugation sorption membrane separations chromatography and liquid liquid extraction Specific phenomena connected with photochemical separation isotope composition and radioactivity are discussed as well The book is written for advanced students of chemistry having the knowledge of physical chemistry Calculation examples are based on the international system of units Unique list

of over 1 300 full references covers scientific literature of the eighteenth to the twenty first centuries *Chemical Micro Process Engineering* Volker Hessel,2005-04-15 Micro process engineering is approaching both academia and industry With the provision of micro devices systems and whole plants by commercial suppliers one main barrier for using these units has been eliminated This book focuses on processes and their plants rather than on devices what is before behind and around micro device fabrication and gives a comprehensive and detailed overview on the micro reactor plants and three topic class applications which are mixing fuel processing and catalyst screening Thus the book reflects the current level of development from micro reactor design to micro reactor process design *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 **Chemical Engineering Progress** ,2007 [Chemical Engineering](#) Ivan Lopez-Arevalo,Victor Sosa-Sosa,2018-04 *Theoretical Foundations of Chemical Engineering* ,1967 [Book Review Index - 2009 Cumulation](#) Dana Ferguson,2009-08 Book Review Index provides quick access to reviews of books periodicals books on tape and electronic media representing a wide range of popular academic and professional interests The up to date coverage wide scope and inclusion of citations for both newly published and older materials make Book Review Index an exceptionally useful reference tool More than 600 publications are indexed including journals and national general interest publications and newspapers Book Review Index is available in a three issue subscription covering the current year or as an annual cumulation covering the past year *Engineering Design* George Ellwood Dieter,1991 The second edition has been reorganized so that the book starts directly with a consideration of the design process and then goes on to show how design fits into society the engineering organization and technology innovation process Much greater emphasis is given to ideas for conceptual design [Laboratory Exercises in Chemical Engineering](#) Frederick Molyneux,1967 **Applied Dimensional Analysis and Modeling** Thomas Szirtes,P. Rózsa,2007 Learn to apply the dimensional method to facilitate the design and testing of engineering and physical systems and greatly accelerate the development of products This is the first book to offer a practical approach to modeling and dimensional analysis emphasizing the interests and problems of the engineer and

applied scientist Packed with illustrations graphs numeric tables and concrete case studies this in depth reference work explains both dimensional analysis and scale modeling concisely describes constructions of dimensional systems including SI metric and Imperial U S and provides over 250 worked out examples drawn from engineering applied physics biomechanics astronomy geometry and economics     **Theoretical Chemical Engineering Abstracts** ,1986     **NASA Thesaurus** ,1982  
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