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Scaleup In Chemical Engineering

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Scaleup In Chemical Engineering:

Scaleup of Chemical Processes Attilio Bisio, Robert L. Kabel, 1985-07-25 The focus of this book is on the technical factors that are critical to the design and startup of a commercial manufacturing facility

Scale-up Methodology for Chemical Processes Jean-Paul Euzen, Pierre Trambouze, Jean-Pierre Wauquier, 1993 Having gained considerable experience in process development at the Institut FranCais du PEtrole the authors present a design framework a review of the available means of investigation and several examples illustrating their methodology of industrial process scale up The salient feature of the book is the fact that it addresses a subject which is vital in view of its economic repercussions yet relatively unknown in technical and scientific circles due to the confidentiality surrounding it Contents 1 Main guidelines of the methodology 2 Various types of model 3 Pilot plants and mock ups 4 Experimental techniques 5 Applications to industrial process development 6 Conclusions References Index

Scale-up in Chemical Engineering Marko Zlokarnik, 2006-08-21 Covering the important task of the scale up of processes from the laboratory to the production scale this easily comprehensible and transparent book is divided into two sections The first part details the theoretical principles introducing the subject for readers without a profound prior knowledge of mathematics It discusses the fundamentals of dimensional analysis the treatment of temperature dependent and rheological material values and scale up where model systems or not available or only partly similar All this is illustrated by 20 real world examples while 25 exercises plus solutions new to this edition practice and monitor learning The second part presents the individual basic operations and covers the fields of mechanical thermal and chemical process engineering with respect to dimensional analysis and scale up The rules for scale up are given and discussed for each operation Other additions to this second edition are dimensional analysis of pelleting processes and a historical overview of dimensional analysis and modeling while all the chapters have been updated to take the latest literature into account Written by a specialist with more than 40 years of experience in the industry this book is specifically aimed at students as well as practicing engineers chemists and process engineers already working in the field

Pilot Plants, Models, and Scale-up Methods in Chemical Engineering Robert Edgeworth Johnstone, Meredith Wooldridge Thring, 1957

Scale-Up in Education Barbara L. Schneider, Sarah-Kathryn McDonald, 2007 Scale Up in Education Volume 1 Ideas in Principle examines the challenges of scaling up from a multidisciplinary perspective It brings together contributions from disciplines that routinely take promising innovations to scale including medicine business engineering computing and education Together the contributors explore appropriate methods for estimating the effects of innovations in larger more diverse settings and provide theories and models to guide the design of innovations most likely to remain viable at large scales Specially commissioned commentaries also discuss the analytical requirements and theoretical possibilities of a program of educational research on scale up built upon these foundations This volume is ideally suited for researchers policymakers and graduate students charged with determining the effectiveness of educational interventions With its insights

into the conceptual and methodological prerequisites for obtaining rigorous actionable evidence of intervention effects the volume provides reading for program evaluation courses in schools of education and public policy

Scale-Up Processes
Jamal Chaouki, Rahmat Sotudeh-Gharebagh, 2021-09-20 Common scale up methods are conventional where the blind piloting is essential This imposes huge investment and leads to failures mostly in solid processing However the limitations of resources current shortcomings short time to market demand are forced companies to minimize piloting With these situations in mind current digitalization outlook and computational facilities we proposed and developed a novel iterative scale up method with case studies which highly expedites the process innovation through the following key sequences

Dimensional Analysis and Scale-up in Chemical Engineering Marko Zlokarnik, 2012-12-06 Contemporary Chemical Process Engineers face complex design and research problems Temperature dependent physical properties and non Newtonian flow behavior of substances in a process cannot be predicted by numerical mathematics Scaling up equipment for processing can often only be done with partial similarity methods Standard textbooks often neglect topics like dimensional analysis theory of similarity and scale up This book fills this gap It is aimed both at university students and the process engineer It presents dimensional analysis very comprehensively with illustrative examples of mechanical thermal and chemical processes

Second International Conference on Chemical Engineering Education D.C. Freshwater, R.M. Blunden, J.R. Flower, 2013-09-11 Second International Conference on Chemical Engineering Education presents the situation in chemical engineering education in Germany Hungary Spain Japan and in the United States This book depicts an awareness of the problems of professional education together with a wide spectrum of opinions on their solution Organized into 39 chapters this book begins with an overview of the actual situation of chemical engineering education program in Spain This text then examines the detailed formalities of chemical engineering in secondary schools Other chapters consider the change in chemical engineering education in Japan due to the change of chemical industries as well as by a great change of students attitude This book discusses as well the curriculum proposal for the education of undergraduate and graduate levels as well as foreign students education The final chapter reviews the European situation of chemical engineering education system This book is a valuable resource for teachers and students of chemical engineering

Chemical Projects Scale Up Joe M. Bonem, 2018-05-31 Chemical Projects Scale Up How to Go from Laboratory to Commercial covers the chemical engineering steps necessary for taking a laboratory development into the commercial world The book includes the problems associated with scale up equipment sizing considerations thermal characteristics associated with scale up safety areas to consider recycling considerations operability reviews and economic viability In addition to the process design aspects of commercializing the laboratory development consideration is given to the utilization of a development in an existing plant Explains how heat removal for exothermic reactions can be scaled up Outlines how a reactor can be sized from batch kinetic data Discusses how the plant performance of a new catalyst can be evaluated Presents how the economics of a new product

process can be developed Discusses the necessary evaluation of recycling in commercial plants **Industrial Process**

Scale-up Jan Harmsen,2013-04-25 This book will help industrial process innovators in research development and commercial start up to assess the risks of commercial scale implementation and provide them with practical guidelines and methods to reduce the risks to acceptable levels The book can also be used in co operation with industrial R D people and academic researchers to shape open innovation programs and in education as a reference book for process innovation courses Offers easily accessible step by step and concise guidelines for industrial process scale up Explains each stage of the innovation funnel research development demonstration commercial implementation for any process type and branch Based on industrial experiences and practices which reduces the risks of commercial scale implementation of new processes to acceptable levels and reduces cost and time of process innovation Very clear attractive layout using text boxes that contain clarifying notes and additional information on specific topics which makes it a quick reference of main subjects and additional information

Chemical Engineering in the Pharmaceutical Industry David J. am Ende,Mary T. am Ende,2019-04-23 A guide to the development and manufacturing of pharmaceutical products written for professionals in the industry revised second edition The revised and updated second edition of Chemical Engineering in the Pharmaceutical Industry is a practical book that highlights chemistry and chemical engineering The book s regulatory quality strategies target the development and manufacturing of pharmaceutically active ingredients of pharmaceutical products The expanded second edition contains revised content with many new case studies and additional example calculations that are of interest to chemical engineers The 2nd Edition is divided into two separate books 1 Active Pharmaceutical Ingredients API s and 2 Drug Product Design Development and Modeling The active pharmaceutical ingredients book puts the focus on the chemistry chemical engineering and unit operations specific to development and manufacturing of the active ingredients of the pharmaceutical product The drug substance operations section includes information on chemical reactions mixing distillations extractions crystallizations filtration drying and wet and dry milling In addition the book includes many applications of process modeling and modern software tools that are geared toward batch scale and continuous drug substance pharmaceutical operations This updated second edition Contains 30new chapters or revised chapters specific to API covering topics including manufacturing quality by design computational approaches continuous manufacturing crystallization and final form process safety Expanded topics of scale up continuous processing applications of thermodynamics and thermodynamic modeling filtration and drying Presents updated and expanded example calculations Includes contributions from noted experts in the field Written for pharmaceutical engineers chemical engineers undergraduate and graduate students and professionals in the field of pharmaceutical sciences and manufacturing the second edition of Chemical Engineering in the Pharmaceutical Industryf ocuses on the development and chemical engineering as well as operations specific to the design formulation and manufacture of drug substance and products *Pharmaceutical Process Scale-Up* Michael Levin,2001-12-12 Focusing on

scientific and practical aspects of process scale up this resource details the theory and practice of transferring pharmaceutical processes from laboratory scale to the pilot plant and production scale It covers parenteral and nonparenteral liquids and semi solids products derived from biotechnology dry blending and powder handling **Chemical Engineering Education** , 1988 *Scale-Up in Education* Barbara Schneider, Sarah-Kathryn McDonald, 2006-12-05 *Scale Up in Education* Volume 1 *Ideas in Principle* examines the challenges of scaling up from a multidisciplinary perspective It brings together contributions from disciplines that routinely take promising innovations to scale including medicine business engineering computing and education Together the contributors explore appropriate methods for estimating the effects of innovations in larger more diverse settings and provide theories and models to guide the design of innovations most likely to remain viable at large scales Specially commissioned commentaries also discuss the analytical requirements and theoretical possibilities of a program of educational research on scale up built upon these foundations This volume is ideally suited for researchers policymakers and graduate students charged with determining the effectiveness of educational interventions With its insights into the conceptual and methodological prerequisites for obtaining rigorous actionable evidence of intervention effects the volume provides reading for program evaluation courses in schools of education and public policy

Lees' Loss Prevention in the Process Industries Frank Lees, 2005-01-10 Over the last three decades the process industries have grown very rapidly with corresponding increases in the quantities of hazardous materials in process storage or transport Plants have become larger and are often situated in or close to densely populated areas Increased hazard of loss of life or property is continually highlighted with incidents such as Flixborough Bhopal Chernobyl Three Mile Island the Phillips 66 incident and Piper Alpha to name but a few The field of Loss Prevention is and continues to be of supreme importance to countless companies municipalities and governments around the world because of the trend for processing plants to become larger and often be situated in or close to densely populated areas thus increasing the hazard of loss of life or property This book is a detailed guidebook to defending against these and many other hazards It could without exaggeration be referred to as the bible for the process industries This is THE standard reference work for chemical and process engineering safety professionals For years it has been the most complete collection of information on the theory practice design elements equipment regulations and laws covering the field of process safety An entire library of alternative books and cross referencing systems would be needed to replace or improve upon it but everything of importance to safety professionals engineers and managers can be found in this all encompassing reference instead Frank Lees world renowned work has been fully revised and expanded by a team of leading chemical and process engineers working under the guidance of one of the world s chief experts in this field Sam Mannan is professor of chemical engineering at Texas A principles practice codes standards data and references needed by those practicing in the field [Scale-Up and Optimization in Preparative Chromatography](#) Anurag Rathore, Ajoy Velayudhan, 2002-09-26 Presenting guidelines to predict and improve separation

system performance this book contains numerous case studies illustrating the practice of scale up principles in process development It offers solutions to limitations that occur in real world purification schemes methods to model optimize and characterize nonlinear separation processes data comparisons from all stages of production and industrial separation schemes for products such as synthetic molecules antibody fragments IgG growth factors and plasmid DNA The book covers external constraints separation economics correlations for transport and kinetic phenomena and the configuration and parameters of column design

How to Scale-Up a Wet Granulation End Point Scientifically Michael Levin,2015-10-07 How to Scale Up a Wet Granulation End Point Scientifically provides a single source devoted to all relevant information on the scale up of a wet granulation end point Contents include a general description problem identification and theoretical background with supporting literature case studies potential solutions and more By outlining issues related to scale up and end point determination and then using practical examples and advice to address these issues How to Scale Up a Wet Granulation End Point Scientifically is a valuable and essential resource for all those pharmaceutical scientists and technologists engaged in the granulation process Thoroughly referenced and based on the latest research and literature Part of the Expertise in Pharmaceutical Process Technology Series edited by internationally respected expert Michael Levin Illustrates the most common problems related to scale up of a wet granulation end point and provides valuable insights on how to solve these problems in a practical way

Pharmaceutical Process Engineering and Scale-up Principles Anil B. Jindal,2023-07-03 The book offers a comprehensive overview of the unit operations involved in the manufacturing process of solid and liquid dosage forms along with the scale up of each operation This book is a valuable resource for professionals working in the pharmaceutical industry and researchers seeking to develop a comprehensive understanding of the various aspects of the manufacturing process The book is divided into four sections covering a range of topics Section I provide readers with a comprehensive understanding of the basic principles behind the manufacturing process of solid and liquid dosage forms Section II covers the different unit operations involved in the production of solid dosage forms including mixing granulation drying compression coating and size reduction This section includes case studies to provide readers with practical insights into the scale up principles involved in the manufacturing process Section III focuses on the manufacturing and scale up of liquid formulations covering topics such as mixing filtration and scale up of liquid mixing process This section offers a comprehensive understanding of the various aspects of the manufacturing process including the challenges and opportunities associated with the scale up of liquid formulations Finally Section IV includes two chapters that describe the manufacturing and scale up of advanced drug delivery systems including the manufacturing and scale up of nanoparticles and biotechnology derived products This section provides readers with insights into the development of innovative drug delivery systems and the challenges involved in their scale up Overall the book is an essential guide for professionals and researchers seeking a deeper understanding of the manufacturing process The case studies and practical examples offer

valuable insights into the challenges and opportunities involved in the scale up process making it an indispensable resource for those involved in the pharmaceutical industry Only book that is dedicated to pharmaceutical process engineering and scale up Contain numerous case studies for easy reference Covers solid liquid and advanced dosage forms **Stirring** Marko Zlokarnik,2008-07-11 Stirring is one of the most important operations in process technology No chemical exists that has non been submitted to a mixing process during its synthesis Furthermore stirring is important for the pharmaceutical and food industries too The most important mixing operations are applied to homogenize miscible liquids to intensify the heat transfer between a liquid and the heat exchanger and to perform mass transfer in multiphase systems to whirl up solid particles in fluids and to disperse immiscible liquids This book discusses in detail the above listed operations taking into consideration also different rheological behaviour of the system treated Newtonian and non Newtonian For each stirring task reliable scale up rules are presented In addition mixing in pipes is discussed in great detail Since there are so many aspects it is almost impossible for the user to get and keep an overview Therefore this book presents more than 730 references and covers publications until the end of the year 2000 for everybody who needs to know more details Food Processing Operations and Scale-up Kenneth J. Valentas,J. Peter Clark,Leon Levin,2020-08-11 Intended for students and practitioners who have a basic education in chemical engineering or food science Contains basic information in each area and describes some of the fundamental ideas of processing development and design Examines the food industry structure how it works consumer products

Scaleup In Chemical Engineering Book Review: Unveiling the Power of Words

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