

SCALE UP MODELLUBERTRAGUNG IN DER VERFAHRENSTECHN

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Scale-up - Marko Zlokarnik 2006-02-10

Das Thema dieses Buches ist die Übertragung von Verfahren aus dem Labor- bzw. dem Technikumsmaßstab in den industriellen Maßstab einer Produktionsanlage. Die einzige zuverlässige Methode dazu basiert auf der Darstellung von Versuchsergebnissen im zutreffenden dimensionsanalytischen Raum, der sich als maßstabsinvariant erweist. Das Buch ist in zwei Teile gegliedert. In der ersten Hälfte werden die theoretischen Grundlagen detailliert vorgestellt, um auch Lesern ohne vertiefte mathematische Vorkenntnisse dieses Themengebiet näherzubringen. Diskutiert werden die Grundlagen der Dimensionsanalyse, die Behandlung von temperaturabhängigen und von rheologischen Stoffwerten und die Modellübertragung bei nicht-Verfügbarkeit von Modell-Stoffsystemen, sowie bei partieller Ähnlichkeit. All dies wird dem Leser anhand von 20 modernen Beispielen aus der heutigen verfahrenstechnischen Praxis illustriert und mit 25 in dieser Auflage neu hinzugekommenen Übungsaufgaben aktiv erarbeitet und anhand der Lösungen kontrolliert. Im zweiten Teil des Buches werden die einzelnen verfahrenstechnischen Grundoperationen aus den Bereichen mechanische, thermische und chemische Verfahrenstechnik von der Warte der Dimensionsanalyse und der Modellübertragung beispielhaft behandelt und es werden für jede Operation die Maßstabsübertragungsregeln vorgestellt und diskutiert. Das vorliegende Buch wendet sich dementsprechend an Studenten wie auch bereits auf

dem Gebiet tätige Ingenieure, Chemiker und Verfahrenstechniker.

Birdflight as the Basis of Aviation - Otto Lilienthal 1911

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.

Dust Explosions - Wolfgang Bartknecht 2011-12-23

The author summarizes today's knowledge of the cause and consequences of dust explosions which were the main focus of his professional life. The presence of explosible dust/air mixtures does not generally represent a risk of an explosion although all organic and metallic dusts are explosible. The author develops test-methods for explosion hazards associated with dust and constructive methods to prevent dust explosions. The book is written for practical use. The reader learns to

recognise the hazard of a dust explosion and the effectiveness of safety measures. The book is richly illustrated and demonstrates the correct use of the empirical theories.

Biom mineralization - Stephen Mann 2001

Moderne Abwassertechnik - Alexandru Braha 2007-03-20

Dieses Buch vermittelt wichtiges Fachwissen der Ökobiotechnologie für die Vermeidung von Fehlplanung und unnötigen Folgekosten beim Bau und Betrieb von Klär- und Abwasserbehandlungsanlagen. Für Verfahrenstechniker immer wichtiger werdende Modellrechnungen und Simulationsmethoden für die Abwasserreinigung werden hier didaktisch aufgearbeitet und präsentiert. Die Autoren schlagen eine Brücke zwischen den biologisch-chemischen und verfahrenstechnischen Seiten der modernen Abwasserbehandlung, so dass sowohl Chemiker, Biotechnologen und Biologen als auch Ingenieure, Verfahrenstechniker und Anlagenplaner jeweils das Fachfremde im Gesamtzusammenhang erläutern finden.

Embodied Artificial Intelligence - Fumiya Iida 2004-07-02

Originating from a Dagstuhl seminar, the collection of papers presented in this book constitutes on the one hand a representative state-of-the-art survey of embodied artificial intelligence, and on the other hand the papers identify the important research trends and directions in the field. Following an introductory overview, the 23 papers are organized into topical sections on - philosophical and conceptual issues - information, dynamics, and morphology - principles of embodiment for real-world applications - developmental approaches - artificial evolution and self-reconfiguration

Living Prototypes - 1961

Theory of Macroscopic Systems - Cor Ouwerkerk 2012-12-06

This book deals with the theory of macroscopic systems. Traditionally this theory has been fragmented over a number of disciplines like thermodynamics, physical transport phenomena, sometimes referred to as non-equilibrium or irreversible thermodynamics, fluid mechanics,

chemical reaction engineering and heat and power engineering. This fragmentation, the different approaches followed in presenting theory, e.g. the inductive approach as opposed to the postulational approach in textbooks on thermodynamics, many alternative representations of equations and differences in notation make it cumbersome to discern a single coherent theory of macroscopic systems. The idea of this book is to present the theory of macroscopic systems as a unified theory with equations strictly developed from a single set of principles and concepts. The book is an attempt to bridge gaps between the various disciplines. It can serve as a textbook, refresher or reference book to students of an advanced level in various disciplines, to scientists and to practising engineers working in design and development. It provides rigorous equations and their possible simplifications for use in computer models for scale-up or optimisation. Topics like exergy analysis and multi component diffusion are included. The principles and concepts in the theory of macroscopic systems comprise in addition to the mole and mass balances over a system, the balance equations for the fundamental extensive properties momentum, energy and entropy as well as the phenomenological laws on asymptotic phase behaviour and molecular transport.

Cybernetics - Heinz von Foerster 2013-06

Transactions Of The Sixth Conference, March 24-25, 1949. Contributing Authors Include John Stroud, Lawrence S. Kubie, Heinz Von Foerster And Norbert Wiener.

Cybernetics - Claus Pias 2016

Annotation Between 1946 and 1953, the Josiah Macy, Jr. Foundation sponsored a series of conferences aiming to bring together a diverse, interdisciplinary community of scholars and researchers who would join forces to lay the groundwork for the new science of cybernetics. These conferences, known as the Macy conferences, constituted a landmark for the field. This book contains the complete transcripts of all ten Macy conferences and the guidelines for the conference proceedings.

Recent Advances in Biotechnology - F. Vardar-Sukan 2012-12-06

In last decades rapid scientific and engineering developments have been

occurring within the context of Biotechnology. If the World Economy is to benefit fully from the advances in biosciences and biochemical engineering, it must be able to focus new knowledge on commercially appropriate targets. Modern Biotechnology is a mixture of far reaching innovation superimposed on an industrial background and it represents a means of production with bright prospects, challenging problems and stimulating competition. This NATO Advanced Study Institute on "RECENT ADVANCES IN INDUSTRIAL APPLICATIONS OF BIOTECHNOLOGY" held between September 16-27, 1991 in Kuşadası was the first ASI on Biotechnology in Turkey. It was aiming to provide an updated overview of the fundamental principles, novel application areas and impact of Biotechnology on international economy. Recent developments in the field of Biotechnology have been thoroughly discussed, concentrating on various interdisciplinary aspects. The lectures presented at the Institute covered both scientific and commercial aspects of new developments in biotechnology and discussed the possible ways of meeting the challenges of the industry. The main lectures were supplemented by Oral and Poster Presentations. Thus, this volume is comprised of three sections. Part I contains the invited

lectures and Part II oral presentations. Extended abstracts of poster presentations have been included in Part III to provide a more comprehensive coverage of the ASI.

Stirring - Marko Zlokarnik 2008-07-11

Stirring is one of the most important operations in process technology. No chemical exists that has not 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.