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The Leading Integrated Chemical Process Design Guide: Now with New Problems, New Projects, and More More than ever, effective design is the focal point of sound chemical engineering. Analysis, Synthesis, and Design of Chemical Processes, Third Edition, presents design as a creative process that integrates both the big picture and the small details—and knows which to stress when, and why. Realistic from start to finish, this book moves readers beyond classroom exercises into open-ended, real-world process problem solving. The authors introduce integrated techniques for every facet of the discipline, from finance to operations, new plant design to existing process optimization. This fully updated Third Edition presents entirely new problems at the end of every chapter. It also adds extensive coverage of batch process design, including realistic examples of equipment sizing for batch sequencing; batch scheduling for multi-product plants; improving production via intermediate storage and parallel equipment; and new optimization techniques specifically for batch processes. Coverage includes Conceptualizing and analyzing chemical processes: flow diagrams, tracing, process conditions, and more Chemical process economics: analyzing capital and manufacturing costs, and predicting or assessing profitability Synthesizing and optimizing chemical processing: experience-based principles, BFD/PFD, simulations, and more Analyzing process performance via I/O models, performance curves, and other tools Process troubleshooting and “debottlenecking” Chemical engineering design and society: ethics, professionalism, health, safety, and new “green engineering” techniques Participating successfully in chemical engineering design teams Analysis, Synthesis, and Design of Chemical Processes, Third Edition, draws on nearly 35 years of innovative chemical engineering instruction at West Virginia University. It includes suggested curricula for both single-semester and year-long design courses; case studies and design projects with practical applications; and

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appendixes with current equipment cost data and preliminary design information for eleven chemical processes—including seven brand new to this edition.

Significant progress has been made in the study of three-dimensional quantitative structure-activity relationships (3D QSAR) since the first publication by Richard Cramer in 1988 and the first volume in the series, 3D QSAR in Drug Design. Theory, Methods and Applications, published in 1993. The aim of that early book was to contribute to the understanding and the further application of CoMFA and related approaches and to facilitate the appropriate use of these methods. Since then, hundreds of papers have appeared using the quickly developing techniques of both 3D QSAR and computational sciences to study a broad variety of biological problems. Again the editor(s) felt that the time had come to solicit reviews on published and new viewpoints to document the state of the art of 3D QSAR in its broadest definition and to provide visions of where new techniques will emerge or new applications may be found. The intention is not only to highlight new ideas but also to show the shortcomings, inaccuracies, and abuses of the methods. We hope this book will enable others to separate trivial from visionary approaches and method too methodology from innovative techniques. These concerns guided our choice of contributors. To our delight, our call for papers elicited a great many manuscripts.

The fourth edition enhanced eBook update of Product and Process Design Principles contains many new resources and supplements including new videos, quiz questions with answer-specific feedback, and real-world case studies to support student comprehension. Product and Process Design Principles covers material for process design courses in the chemical engineering curriculum—demonstrating how process design and product design are interlinked and their importance for modern applications. Presenting a systematic approach, this fully-updated new edition describes modern strategies for the design of chemical products and processes. The text presents two parallel tracks—product design and process design—which enables instructors to easily show how product designs lead to new chemical processes and, alternatively, teach product design as separate course. Divided into five parts, the fourth edition begins with a broad introduction to product design followed by a comprehensive introduction to process synthesis and analysis. Succeeding chapters cover the products and processes of design synthesis, design analysis, and design reports. The final part of the book presents ten case studies which look at product and process designs such as for Vitamin C tablets, conductive ink for printed electronics, and home hemodialysis devices. Effective pedagogical tools are thoroughly and consistently implemented throughout the text.

Offering comprehensive coverage of this hot topic, this two-volume handbook and ready reference treats a wide range of important aspects, from synthesis and catalytic properties of carbon materials to their applications as metal-free catalysts in various important reactions and industrial processes. Following a look at recent

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advances in the development of carbon materials as carbon-based metal-free catalysts, subsequent sections deal with a mechanistic understanding for the molecular design of efficient carbon-based metal-free catalysts, with a special emphasis on heteroatom-doped carbon nanotubes, graphene, and graphite. Examples of important catalytic processes covered include clean energy conversion and storage, environmental protection, and synthetic chemistry. With contributions from world-leading scientists, this is an indispensable source of information for academic and industrial researchers in catalysis, green chemistry, electrochemistry, materials science, nanotechnology, energy technology, and chemical engineering, as well as graduates and scientists entering the field.

The methods used by chemists and chemical engineers for the conception, design and operation of chemical process systems have undergone significant changes in the last 10 years. The most important of modern computer-aided techniques are process analysis and process system synthesis, both of which are closely related. The first part of the book presents the principles of model building, simulation and model application. On the basis of an appropriate set of hierarchical levels of chemical systems, the general strategy of analysis by deterministic and statistical methods is treated. The second part deals with process system synthesis beginning with reaction path analysis. One of the major features of this part are new methods for the synthesis of reactor networks, separation sequences, heat-exchanger systems and entire chemical process systems by a combined procedure of heuristic rules and fuzzy set algorithms. This procedure, which is known as knowledge engineering, is an efficient combination of human creativity and theoretically based knowledge. This book, which is illustrated by examples, should prove extremely useful as a text for a senior/graduate course for students of chemistry and chemical engineering and will also be invaluable for chemists and chemical engineers in research and industry, and specialists dealing with the analysis and synthesis of process systems.

Oehlert's text is suitable for either a service course for non-statistics graduate students or for statistics majors. Unlike most texts for the one-term grad/upper level course on experimental design, Oehlert's new book offers a superb balance of both analysis and design, presenting three practical themes to students: • when to use various designs • how to analyze the results • how to recognize various design options Also, unlike other older texts, the book is fully oriented toward the use of statistical software in analyzing experiments.

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