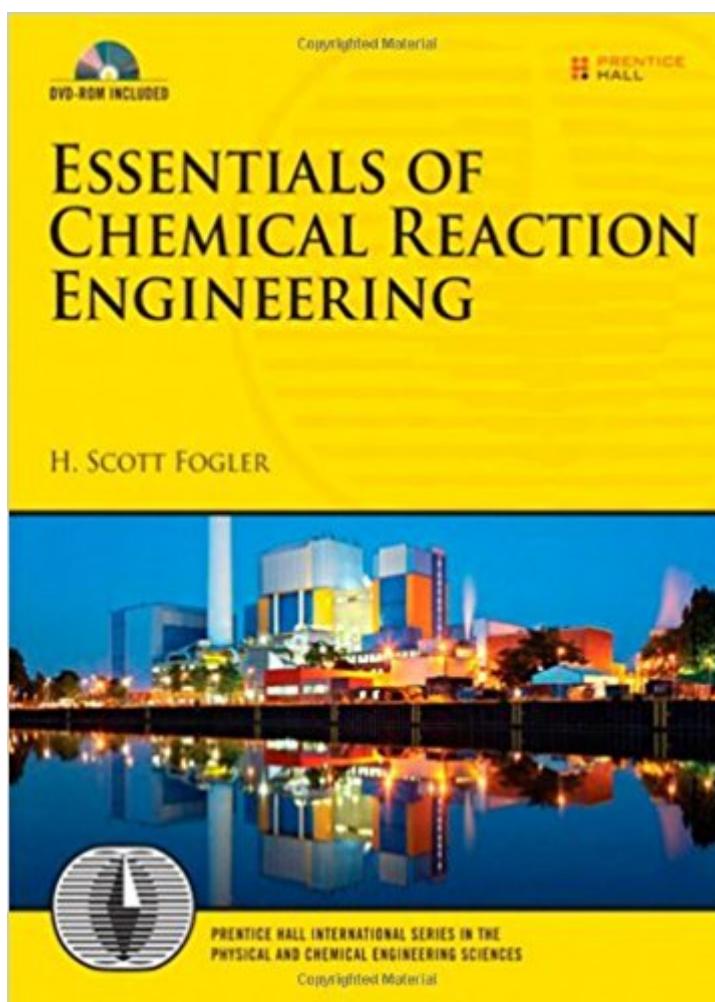


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# Essentials Of Chemical Reaction Engineering (Prentice Hall International Series In Physical And Chemical Engineering)



## Synopsis

Learn Chemical Reaction Engineering through Reasoning, Not Memorization

*Essentials of Chemical Reaction Engineering* is the complete, modern introduction to chemical reaction engineering for today's undergraduate students. Starting from the strengths of his classic *Elements of Chemical Reaction Engineering*, Fourth Edition, in this volume H. Scott Fogler added new material and distilled the essentials for undergraduate students. Fogler's unique way of presenting the material helps students gain a deep, intuitive understanding of the field's essentials through reasoning, using a CRE algorithm, not memorization. He especially focuses on important new energy and safety issues, ranging from solar and biomass applications to the avoidance of runaway reactions.

Thoroughly classroom tested, this text reflects feedback from hundreds of students at the University of Michigan and other leading universities. It also provides new resources to help students discover how reactors behave in diverse situations—including many realistic, interactive simulations on DVD-ROM.

**New Coverage Includes**

- Greater emphasis on safety: following the recommendations of the Chemical Safety Board (CSB), discussion of crucial safety topics, including ammonium nitrate CSTR explosions, case studies of the nitroaniline explosion, and the T2 Laboratories batch reactor runaway
- Solar energy conversions: chemical, thermal, and catalytic water spilling
- Algae production for biomass
- Steady-state nonisothermal reactor design: flow reactors with heat exchange
- Unsteady-state nonisothermal reactor design with case studies of reactor explosions

**About the DVD-ROM**

The DVD contains six additional, graduate-level chapters covering catalyst decay, external diffusion effects on heterogeneous reactions, diffusion and reaction, distribution of residence times for reactors, models for non-ideal reactors, and radial and axial temperature variations in tubular reactions. Extensive additional DVD resources include

- Summary notes, Web modules, additional examples, derivations, audio commentary, and self-tests
- Interactive computer games that review and apply important chapter concepts
- Innovative "Living Example Problems" with Polymath code that can be loaded directly from the DVD so students can play with the solution to get an innate feeling of how reactors operate
- A 15-day trial of Polymath is included, along with a link to the Fogler Polymath site
- A complete, new AspenTech tutorial, and four complete example problems
- Visual Encyclopedia of Equipment, Reactor Lab, and other intuitive tools
- More than 500 PowerPoint slides of lecture notes

Additional updates, applications, and information are available at [www.umich.edu/~essen](http://www.umich.edu/~essen) and [www.essentialsofcre.com](http://www.essentialsofcre.com).

## Book Information

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## Customer Reviews

Learn Chemical Reaction Engineering through Reasoning, Not Memorization    Essentials of Chemical Reaction Engineering is a complete yet concise, modern introduction to chemical reaction engineering for undergraduate students. While the classic Elements of Chemical Reaction Engineering, Fourth Edition, is still available, H. Scott Fogler distilled that larger text into this volume of essential topics for undergraduate students. Fogler's unique way of presenting the material helps students gain a deep, intuitive understanding of the field's essentials through reasoning, not memorization. He especially focuses on important new energy and safety issues, ranging from solar and biomass applications to the avoidance of runaway reactions. Thoroughly classroom tested, this text reflects feedback from hundreds of students at the University of Michigan and other leading universities. It also provides new resources to help students discover how reactors behave in diverse situations—including many realistic, interactive simulations on DVD-ROM. Coverage includes Crucial safety topics, including ammonium nitrate CSTR explosions, nitroaniline and T2 Laboratories batch reactor runaways, and SACHE/CCPS resources. Greater emphasis on safety: following the recommendations of the Chemical Safety Board (CSB) 2 case studies from plant explosions and two homework problems which discuss another explosion. Solar energy conversions: chemical, thermal, and catalytic water splitting. Algae production for biomass. Mole balances: batch, continuous-flow, and industrial reactors. Conversion and reactor sizing: design equations, reactors in series, and more. Rate laws and stoichiometry. Isothermal reactor design: conversion and molar flow rates. Collection and analysis of rate data. Multiple

reactions: parallel, series, and complex reactions; membrane reactors; and more Reaction mechanisms, pathways, bioreactions, and bioreactors Catalysis and catalytic reactors Nonisothermal reactor design: steady-state energy balance and adiabatic PFR applications Steady-state nonisothermal reactor design: flow reactors with heat exchange About the DVD-ROM The DVD contains six additional, graduate-level chapters covering catalyst decay, external diffusion effects on heterogeneous reactions, diffusion and reaction, distribution of residence times for reactors, models for non-ideal reactors, and radial and axial temperature variations in tubular reactions. Extensive additional DVD resources include: Summary notes, additional examples, derivations, audio commentary, and self-tests Web modules applying key concepts to standard and nonstandard problems, such as the use of wetlands to degrade toxic chemicals Interactive computer games that review and apply important chapter concepts Innovative "Living Example" and Green Engineering home problems A link to the Fogler Polymath site and the polymath code to solve the examples from the book are included on the DVD Included are the codes necessary to solve the COMSOL Multiphysics examples from the text. A complete, new AspenTech tutorial, and four complete example problems FAQs, answering CRE questions commonly asked by undergraduates Visual Encyclopedia of Equipment, Reactor Lab, and other intuitive tools Links to humorous YouTube CRE videos created by students at the University of Alabama Additional updates, applications, and information will be provided on the web.

H. Scott Fogler is the Ame and Catherine Vennema Professor of Chemical Engineering and the Arthur F. Thurnau Professor at the University of Michigan, and is the 2009 President of the American Institute of Chemical Engineers. His research interests include flow and reaction in porous media, fused chemical relations, gellation kinetics, colloidal phenomena, and catalyzed dissolution. He has been thesis advisor for 40 Ph.D. students and has more than 200 refereed publications in these areas. Fogler has chaired ASEE's Chemical Engineering Division, served as director of the American Institute of Chemical Engineers, and earned the Warren K. Lewis Award from AIChE for contributions to chemical engineering education. He also received the Chemical Manufacturers Association's National Catalyst Award. He is a coauthor of the best-selling textbook *Strategies for Creative Problem Solving*, Third Edition (Prentice Hall, 2014).

This is actually one of the best textbooks that I've been required to use. The topics are explained

very well in this text and the examples are excellent. The book problems are very difficult though, which is a bit surprising. I used this book as part of a kinetics class and I actually felt like it was quite a bit of help. The writing is good and it's easy to follow the topics. It reads very linearly for the most part which is a good thing. It's a great textbook for reaction engineering.

I have read this book up to chapter 7 for my class at the moment of this review and I want to say that this is hands down one of the best chemical engineering books out there. This book explains everything clearly and will leave you with no questions after you read it and think through it. Also it has many great example that really help solve the end of chapter problems, and the end of chapter summaries are great help for going back for formulas and quick references. It also comes with extra content and worked examples in the CD, including extra chapters. I have to admit that I have not used this included resource as of yet since they do a lot of stuff in POLYMATH and MATLAB and I use python. But is there for whoever wants to use that software. Anyways, after a year of using a horrible transport phenomena book this book comes at a great surprise and I strongly recommend you get it even if professor posts notes. And if you get it new (I don't know if it works for used copies) you can get a free PDF along with a reduced POLYMATH price of \$19.50. I will post back after I finish the book but so far I am loving it and learning a lot.

In attempts to make the book easier to read (I guess?), they have absolutely butchered it. Rather than displaying the text in regular, individual pages (like that of a normal book) the information is reformatted as make-shift slides. This would be fine if done in a precise manner. However, in this case it looks as if they literally just copied the information from the text and directly pasted it into slides, completely disregarding formatting irregularities. The spacing between sentences in paragraphs and the general structure seems like a mess. I would highly recommend finding a PDF version or buying the hard copy.

Written in a ridiculous order, this book will have you jumping from chapter 2 to 13 to.

The book is in great condition. The description given is very accurate. I am very satisfied.

This is such a good kinetics textbook. The explanations are wonderful and there's even a bit of humor in it (weird, I know but it made me smile). If you have a choice in textbooks, get this one. The seller packaged the book well and it arrived in perfect condition.

good book

Ok text. Very easily understood and author shows multiple ways of analyzing reactors. I don't like the fact that it's often too much. It would be better to leave general formulae alone and show several examples. What confused many students is highlighted formulas that would only apply to a very specific case without precisely stating it. It comes with dvd to supplement it

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