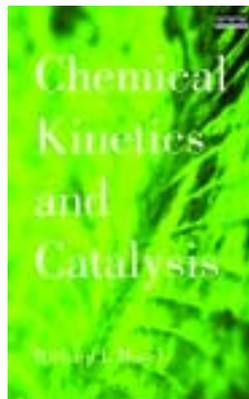


Books

Chemical Kinetics and Catalysis

**Richard I. Masel,
John Wiley and Sons,
New York, NY, 952 pp.,
\$99.95, 2001**



Chemical kinetics has found its applications in many disciplines, such as biological sciences, engineering and environmental sciences. This contemporary book involves many concepts including classical kinetics, theory of reaction rates (collision theory, transition state theory, Rice-Ramsperger-Kassel-Marcus (RRKM) model), prediction of potential energy surfaces, and catalysis. It describes how one can use trajectory calculations to calculate rates. The material is presented with the reader in mind. The book contains well-structured information that can be easily accessed. As stated in the preface “read the words as well as equations.”

At the beginning of each chapter, there is a historical background, that not only motivates the reader about the subject, but also indicates how the science advanced in the topic covered. As a result of the author’s years of experience in teaching kinetics courses, solved examples illustrate every step in the solution to help self-learning.

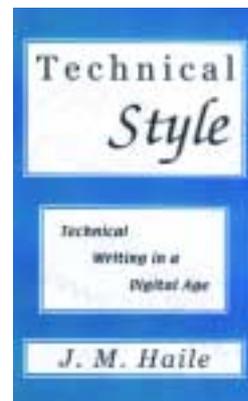
Clearly, Masel’s discussion of solvents as catalysts stands as one of the preeminent works in chemistry. Solvents can initiate reactions or stabilize intermediates and transition states just like catalysts. Therefore, they can control selectivity. While energy transfer eases, mass-transfer limitations become more important during the presence of solvents.

Many textbooks in reaction engineering lack critical chemistry and kinetics. Due to the wide use of catalysts in industrial processes, it is vital to include catalysis and heterogeneous reaction systems in a textbook. While this book describes in great detail chemical kinetics and catalysis, it is not a complete resource for a one-semester course in reaction kinetics, because as the title implies, it does not include any reactor analysis and design. As compared to its predecessors, Masel’s book stands out with its up-to-date content. The book will find readers in a variety of disciplines, including researchers, students and professors.

*Semsi Ensari, Ph.D.
Postdoctoral Researcher
Univ. of California
Irvine, CA*

Technical Style

**J. M. Haile, Macatea
Productions,
Central, SC, 208 pp.,
\$29.95, 2002**



To make the most of this book, you should read it, work through the examples, and analyze and edit your own writing using the author’s advice. Detailed explanations of what makes good writing good and bad writing bad will help you identify what needs to be edited and why, and guide you on how to improve it. By going through the write/analyze/edit process for every report, paper, memo or other technical documents you write, your writing will improve over time.

The first three chapters deal with basic principles of good writing that apply to words and phrases, sentences, and paragraphs. Much of the advice you’ve probably heard before: choose strong verbs and precise, descriptive nouns, adjectives and adverbs; avoid multiple prepositional phrases in a row; keep structures parallel; be concise and avoid redundancies; use the active voice where possible; and create strong linkages between words, phrases, sentences and paragraphs. The author discusses these and other principles, and provides examples to illustrate good and bad writing.

The chapter on punctuation is especially good. The author does an excellent job of summarizing some key guidelines concerning the use of commas, semicolons, colons, dashes and hyphens.

Chapters 5 through 7 provide valuable guidance regarding equations, tables and graphics. Some of the author’s points are common sense, but they are important enough to warrant discussion; equations, tables and graphics deserve as much care as text. The chapter on graphics is comprehensive in its coverage of the various types of plots and charts for presenting experimental results. A shortcoming, though, is that it does not discuss other types of figures, such as block diagrams, schematics, cutaway drawings, pie charts, bar graphs, photographs, and so on; some guidelines on when to use these other types of figures would be a good addition.

A important value-added feature of this book is the set of examples at the end of each chapter. Don’t skip these examples — by working through them, you’ll gain a much better understanding of what the author has discussed. It would have been even more instructional, however, if he had provided revised versions of the examples.

The only way for you to learn to write well is to write. This is an excellent book that can serve as your lesson plan for self-study.

*Cynthia F. Mascone
Managing Editor, CEP
New York, NY*

Other topics include the mechanism and kinetics of noncatalytic processes in gaseous, liquid, and solid phases, quantum chemical calculations in kinetics and catalysis, methods of studying catalytic processes and catalysts, the chemistry of catalysts and adsorbent surfaces, the structure and physicochemical properties of catalysts, preparation and poisoning of catalysts, macrokinetics, and computer simulations in catalysis. The journal also publishes review articles on contemporary problems in kinetics and catalysis. The journal welcomes manuscripts from all countries in the English or Russian Chemical Kinetics & Catalysis. Sign in. Top publications. Categories. Chemical & Material Sciences. Chemical Kinetics & Catalysis. Subcategories Analytical Chemistry Biochemistry Ceramic Engineering Chemical & Material Sciences (general) Chemical Kinetics & Catalysis. Combustion & Propulsion Composite Materials Crystallography & Structural Chemistry Dispersion Chemistry Electrochemistry Inorganic Chemistry. Materials Engineering Medicinal Chemistry Nanotechnology Oil, Petroleum & Natural Gas Organic Chemistry Polymers & Plastics. h5-index is the h-index for \hat{c} Basic Concepts of Chemical Kinetics. \hat{c} Simple and Complex Reactions \hat{c} Simple reactions have one step and their stoichiometric equations exactly express the real process. \hat{c} For example: $\text{NO}_2 + \text{NO}_2 = \text{N}_2\text{O}_4$ \hat{c} Complex reactions have several steps and their stoichiometric equations don't express the real process which consists from several steps. \hat{c} For example: $\text{H}_2\text{O}_2 + 2\text{HI} = \text{I}_2 + 2\text{H}_2\text{O}$ \hat{c} The first step $\text{H}_2\text{O}_2 + \text{HI} = \text{HOI} + \text{H}_2\text{O}$ \hat{c} The second step $\text{HOI} + \text{HI} = \text{I}_2 + \text{H}_2\text{O}$ \hat{c} $\text{H}_2\text{O}_2 + 2\text{HI} = \text{I}_2 + 2\text{H}_2\text{O}$ \hat{c} Most reactions are complex. The mechanism of every chemical reaction is determined by the sum of steps. Every in Chemical Kinetics Definition in Chemistry. Understanding Chemical Kinetics and Rate of Reaction. Share. Flipboard. Email. Print. \hat{c} Some chemical reactions may involve complicated kinetics, but the basic principles of kinetics are learned in high school and college general chemistry classes. Key Takeaways: Chemical Kinetics. Chemical kinetics or reaction kinetic is the scientific study of the rates of chemical reactions. This includes the development of mathematical model to describe the rate of reaction and an analysis of the factors that affect reaction mechanisms. Peter Waage and Cato Guldberg are credited with pioneering the field of chemical kinetics by describing the law of mass action. \hat{c} Chemical kinetics is the study of how rapidly chemical reactions occur. \hat{c} rate at which a chemical process occurs. \hat{c} Reaction rates depends on. \hat{c} The concentrations of the reactants \hat{c} Temperature \hat{c} The presence of a catalyst \hat{c} Surface area. Factors Affecting Reaction Rate: Nature of the Reactants. \hat{c} Nature of the reactants means what kind of reactant. \hat{c} Chemical Kinetics. Factors Affecting Reaction Rate: Catalysts. \hat{c} Catalysts are substances that affect the speed of a reaction without being consumed. \hat{c} Most catalysts are used to speed up a reaction; these are called positive catalysts. \hat{c} catalysts used to slow a reaction are called negative catalysts. \hat{c} Homogeneous = present in same phase \hat{c} Heterogeneous = present in different phase.