**Chemical Reaction Kinetics: Concepts, Methods and Case Studies**

Jorge Ancheyta

**E-Book**
- 978-1-119-22700-7
- June 2017
- $74.99

**Hardcover**
- 978-1-119-22664-2
- August 2017
- $93.50

**O-Book**
- 978-1-119-22666-6
- June 2017

**DESCRIPTION**

A practical approach to chemical reaction kinetics—from basic concepts to laboratory methods—featuring numerous real-world examples and case studies

This book focuses on fundamental aspects of reaction kinetics with an emphasis on mathematical methods for analyzing experimental data and interpreting results. It describes basic concepts of reaction kinetics, parameters for measuring the progress of chemical reactions, variables that affect reaction rates, and ideal reactor performance. Mathematical methods for determining reaction kinetic parameters are described in detail with the help of real-world examples and fully-worked step-by-step solutions. Both analytical and numerical solutions are exemplified.

The book begins with an introduction to the basic concepts of stoichiometry, thermodynamics, and chemical kinetics. This is followed by chapters featuring in-depth discussions of reaction kinetics; methods for studying irreversible reactions with one, two and three components; reversible reactions; and complex reactions. In the concluding chapters the author addresses reaction mechanisms, enzymatic reactions, data reconciliation, parameters, and examples of industrial reaction kinetics. Throughout the book industrial case studies are presented with step-by-step solutions, and further problems are provided at the end of each chapter.

- Takes a practical approach to chemical reaction kinetics basic concepts and methods
- Features numerous illustrative case studies based on the author’s extensive experience in the industry
• Provides essential information for chemical and process engineers, catalysis researchers, and professionals involved in developing kinetic models

• Functions as a student textbook on the basic principles of chemical kinetics for homogeneous catalysis

• Describes mathematical methods to determine reaction kinetic parameters with the help of industrial case studies, examples, and step-by-step solutions

*Chemical Reaction Kinetics* is a valuable working resource for academic researchers, scientists, engineers, and catalyst manufacturers interested in kinetic modeling, parameter estimation, catalyst evaluation, process development, reactor modeling, and process simulation. It is also an ideal textbook for undergraduate and graduate-level courses in chemical kinetics, homogeneous catalysis, chemical reaction engineering, and petrochemical engineering, biotechnology.

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**ABOUT THE AUTHOR**

**Jorge Ancheyta,** is Manager of Products for Transformation of the Crude Oil at the Mexican Petroleum Institute (IMP). He also has been a Professor in the School of Chemical Engineering and Extractive Industries at the National Polytechnic Institute of Mexico (ESIQIE-IPN) since 1992. Dr. Ancheyta works on the development and application of petroleum refining catalysts, kinetic and reactor models, and process technologies mainly in catalytic cracking, catalytic reforming, middle distillate hydrotreating and heavy oils upgrading.

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