Principles of Physical Chemistry, Second Edition
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Hardcover ISBN: 978-0-470-08964-4 March 2009 $171.50

DESCRIPTION

Principles of Physical Chemistry, Second Edition uniquely uses simple physical models as well as rigorous treatments for understanding molecular and supramolecular systems and processes. In this way the presentation assists students in developing an intuitive understanding of the subjects as well as skill in quantitative manipulations. The unifying nature of physical chemistry is emphasized in the book by its organization - beginning with atoms and molecules, and proceeding to molecular assemblies of increasing complexity, ending with the emergence of matter that carries information, i.e. the origin of life, a physicochemical process of unique importance. The aim is to show the broad scope and coherence of physical chemistry.

ABOUT THE AUTHOR

HANS KUHN, Dr. phil, became a Professor at the University of Basel in 1951. From 1953–1970 he was on the chair of the Institute of Physical Chemistry at the Philipps-University at Marburg, and in 1970 he became Director at the Max Planck Institute for Biophysical Chemistry (Karl-Friedrich-Bonhoeffer-Institut) until he retired in 1985. Professor Kuhn has published papers in such fields as polymer science, quantum chemistry, organized molecular assemblies, and the origin of life.

HORST-DIETER FÖRSTERLING, Dr. phil., was a Professor in the Department of Physical Chemistry at the Philipps-University of Marburg from 1972 until his retirement in 1999. Professor Försterling has taught physical chemistry courses and laboratory courses at all levels, including graduate and advanced graduate courses in spectroscopy, statistical mechanics, reaction kinetics,
David H. Waldeck, PhD, is Professor and Chair in the Department of Chemistry at the University of Pittsburgh. Professor Waldeck has taught chemistry courses at all levels, including graduate and advanced graduate courses in statistical mechanics, reaction dynamics, and quantum mechanics. His research interests include condensed-phase reaction dynamics (homogeneous and heterogeneous), solute-solvent interactions (structural and dynamical characteristics), relaxation processes in solids, and electron transport at the nanometer scale.

NEW TO EDITION

- Chemical equilibria and reactions chapters are enhanced with a more molecular and statistical perspective.

- Chapter 21 on kinetics has been expanded to underscore the importance of potential energy (or free energy) curves in view of reaction kinetics and to make important connections to modern studies in electron transfer reactions, 'femtochemistry', and reaction dynamics.

- Discussion of solids and nanoscale materials (quantum dots, nanotubes, etc).

- The 'Problems' (worked examples) have been integrated into each chapter, rather than presented at the end of the chapter.

- A set of problems to be worked by the student will be presented at the end of each chapter (solutions will be provided in a separate format).

- Provides students with computer exercises, using MathCAD modules in which the student can change the parameters and observe how the system changes.
FEATURES

• Provides a simple model to understand the essence of quantum mechanics and why atoms and molecules exist (electron-in-a-box model)

• Exposes beginners to statistical thermodynamics

• Includes largely neglected topics in the present day curriculum, such as: macromolecules, the principles of organized molecular assemblies, the construction of supramolecular machines and the basic mechanism in the emergence of information producing and carrying forms of matter

• Provides a CD-ROM with interactive MATHCAD exercises and data tables with search functions

• A solution's manual is available

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