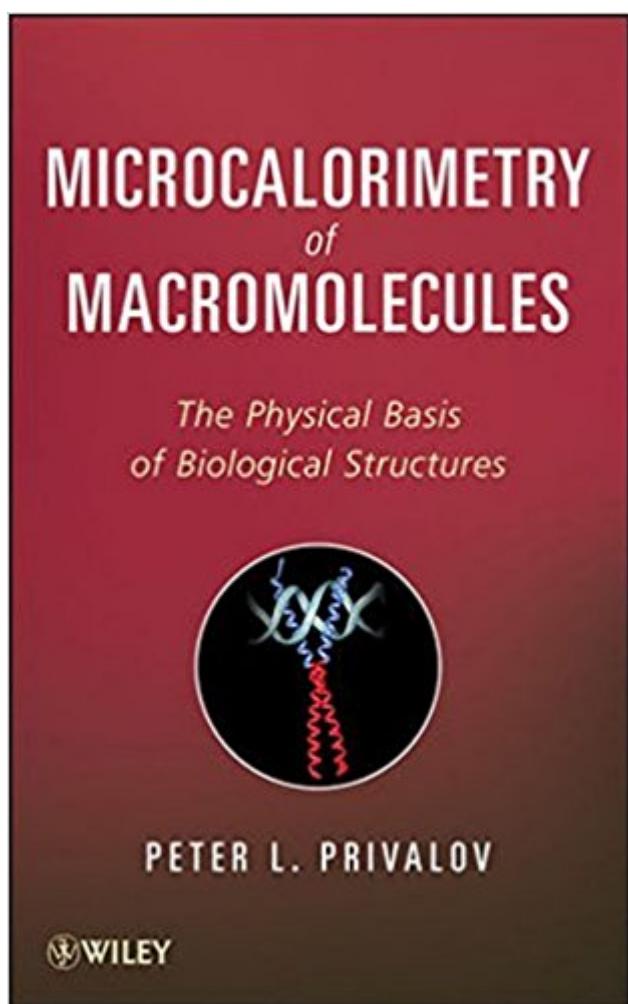


The book was found

Microcalorimetry Of Macromolecules: The Physical Basis Of Biological Structures



Synopsis

Examining the physical basis of the structure of macromolecules—proteins, nucleic acids, and their complexes—using calorimetric techniques Many scientists working in biology are unfamiliar with the basics of thermodynamics and its role in determining molecular structures. Yet measuring the heat of structural change a molecule undergoes under various conditions yields information on the energies involved and, thus, on the physical bases of the considered structures. Microcalorimetry of Macromolecules offers protein scientists unique access to this important information. Divided into thirteen chapters, the book introduces readers to the basics of thermodynamics as it applies to calorimetry, the evolution of the calorimetric technique, as well as how calorimetric techniques are used in the thermodynamic studies of macromolecules, detailing instruments for measuring the heat effects of various processes. Also provided is general information on the structure of biological macromolecules, proteins, and nucleic acids, focusing on the key thermodynamic problems relating to their structure. The book covers: The use of supersensitive calorimetric instruments, including micro and nano-calorimeters for measuring the heat of isothermal reactions (Isothermal Titration Nano-Calorimeter), the heat capacities over a broad temperature range (Scanning Nano-Calorimeter), and pressure effects (Pressure Perturbation Nano-Calorimeter) Two of the simplest but key structural elements: the α and polyproline helices and their complexes, the α -helical coiled-coil, and the pyroline coiled-coils Complicated macromolecular formations, including small globular proteins, multidomain proteins and their complexes, and nucleic acids Numerous examples of measuring the ground state of protein energetics, as well as changes seen when proteins interact The book also reveals how intertwined structure and thermodynamics are in terms of a macromolecule's organization, mechanism of formation, the stabilization of its three-dimensional structure, and ultimately, its function. The first book to describe microcalorimetric technique in detail, enough for graduate students and research scientists to successfully plumb the structural mysteries of proteins and the double helix, Microcalorimetry of Macromolecules is an essential introduction to using a microcalorimeter in biological studies.

Book Information

Hardcover: 404 pages

Publisher: Wiley; 1 edition (July 31, 2012)

Language: English

ISBN-10: 111810451X

ISBN-13: 978-1118104514

Product Dimensions: 6.4 x 1 x 9.5 inches

Shipping Weight: 1.6 pounds (View shipping rates and policies)

Average Customer Review: Be the first to review this item

Best Sellers Rank: #1,725,546 in Books (See Top 100 in Books) #36 in Books > Science & Math > Chemistry > Polymers & Macromolecules #1321 in Books > Science & Math > Chemistry > Organic #1981 in Books > Engineering & Transportation > Engineering > Bioengineering > Biochemistry

Customer Reviews

Examining the physical basis of the structure of macromolecules—proteins, nucleic acids, and their complexes—using calorimetric techniques Many scientists working in biology are unfamiliar with the basics of thermodynamics and its role in determining molecular structures. Yet measuring the heat of structural change a molecule undergoes under various conditions yields information on the energies involved and, thus, on the physical bases of the considered structures. Microcalorimetry of Macromolecules offers protein scientists unique access to this important information. Divided into thirteen chapters, the book introduces readers to the basics of thermodynamics as it applies to calorimetry, the evolution of the calorimetric technique, as well as how calorimetric techniques are used in the thermodynamic studies of macromolecules, detailing instruments for measuring the heat effects of various processes. Also provided is general information on the structure of biological macromolecules, proteins, and nucleic acids, focusing on the key thermodynamic problems relating to their structure. The book covers: The use of supersensitive calorimetric instruments, including micro and nano-calorimeters for measuring the heat of isothermal reactions (Isothermal Titration Nano-Calorimeter), the heat capacities over a broad temperature range (Scanning Nano-Calorimeter), and pressure effects (Pressure Perturbation Nano-Calorimeter) Two of the simplest but key structural elements: the α and polyproline helices and their complexes, the α -helical coiled-coil, and the pyroline coiled-coils Complicated macromolecular formations, including small globular proteins, multidomain proteins and their complexes, and nucleic acids Numerous examples of measuring the ground state of protein energetics, as well as changes seen when proteins interact The book also reveals how intertwined structure and thermodynamics are in terms of a macromolecule's organization, mechanism of formation, the stabilization of its three-dimensional structure, and ultimately, its function. The first book to describe microcalorimetric technique in detail, enough for graduate students and research scientists to successfully plumb the structural mysteries of proteins and the double helix, Microcalorimetry of Macromolecules is an

essential introduction to using a microcalorimeter in biological studies.

PETER L. PRIVALOV is a Professor of Biology and Biophysics at the Johns Hopkins University since 1991. He received his PhD in physics from the University of Georgia, Tbilisi (former USSR), and his DrSc in biophysics from the Institute of Biophysics, Russian Academy of Sciences, Moscow. For many years, he headed the Laboratory of Thermodynamics at the Protein Research Institute of the Russian Academy of Sciences. He is the author of 230 scientific papers published in various international journals and periodicals.

[Download to continue reading...](#)

Microcalorimetry of Macromolecules: The Physical Basis of Biological Structures Macromolecules, Volume 3: Physical Structures and Properties (v. 3) Macromolecules: Volume 1: Chemical Structures and Syntheses Binding and Linkage: Functional Chemistry of Biological Macromolecules Crystallization of Biological Macromolecules The Physical Basis of Bacterial Quorum Communication (Biological and Medical Physics, Biomedical Engineering) Physical Chemistry of Macromolecules Pathophysiology - E-Book: The Biologic Basis for Disease in Adults and Children (Pathophysiology the Biologic Basis) SPECIFICATIONS OF INTRODUCTION TO PHARMACOKINETICS AND PHARMACODYNAMICS: THE QUANTITATIVE BASIS OF DRUG THERAPY : THE QUANTITATIVE BASIS OF DRUG THERAPY 1ST EDITION (PAPERBACK) Study Guide for Pathophysiology: The Biological Basis for Disease in Adults and Children, 7e AIDS: The Biological Basis (Jones and Bartlett Topics in Biology) Study Guide for Pathophysiology - E-Book: The Biological Basis for Disease in Adults and Children Study Guide for Pathophysiology: The Biological Basis for Disease in Adults and Children, 6e Biological Basis of Dental Caries: An Oral Biology Textbook AIDS: The Biological Basis (Jones & Bartlett Learning Topics in Biology) Sabiston Textbook of Surgery: The Biological Basis of Modern Surgical Practice, 20e Sabiston Textbook of Surgery: The Biological Basis of Modern Surgical Practice, 19th Edition Mechanistic Toxicology: The Molecular Basis of How Chemicals Disrupt Biological Targets, Second Edition The Biological Basis of Mental Health Polymers From the Inside Out: An Introduction to Macromolecules

[Contact Us](#)

[DMCA](#)

[Privacy](#)

FAQ & Help