

It is in the chapters on biochemical aspects where the most extensive additions have been made, particularly in the detailed presentation of the biosynthesis of cholesterol and the porphyrins. Yet very few new specific references to the original literature have been added to those of the second edition (1951). References through 1955 are chiefly limited to a number of general and review articles; these are appended at the close of each chapter.

In spite of its shortcomings it remains a useful introductory textbook in tracer chemistry, particularly for students of biochemistry.

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Thermodynamics of One-Component Systems. By WILLIAM N. LACEY and BRUCE H. SAGE, Chemical Engineering Laboratory, California Institute of Technology, Pasadena, California. Academic Press, Inc., 111 Fifth Avenue, New York 3, N. Y. 1957. xi + 376 pp. 16 × 23.5 cm. Price, \$8.00.

This book is designed to help students of engineering make the transition "from idealized thermodynamics to the combination of thermodynamics with mechanics needed for the every day problems of the engineer." The subject matter is limited to one-component systems for the authors believe that "a clear understanding of a limited field is more valuable than a superficial acquaintance over a broader front." The units used are the usual engineering units.

The first part (144 pp.) deals with thermodynamic principles. Its special feature is some use of the concept of friction in the development of relations between heat, work and the thermodynamic functions. This concept allows the engineer to differentiate between the applied work and the actual work done on the system. In this section equations are developed and applied to homogeneous systems of gases and liquids of unit weight, heterogeneous systems of unit weight, and systems of variable weight. A chapter on irreversible processes and reactions between systems of constant weight is also included.

The second part deals with flow processes under conditions of steady flow. About 70 pages are devoted to principles and to the development of equations and 70 pages to engines, compression of gases, refrigeration, and liquefaction of gases at low temperature. An appendix of 60 pages includes a 14 page section on the experimental determination of thermodynamic properties.

In view of the experience of the authors, non-engineers should not be surprised to find in this book a detailed treatment of the thermodynamics of one or two-phase one-component systems from the point of view of one who is to make measurements on them or to interpret thermodynamic diagrams of them. The book will also be useful to those who wish to consider the application of thermodynamics to practical situations.

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Biophysical Chemistry. Volume I. Thermodynamics, Electrostatics, and the Biological Significance of the Properties of Matter. By JOHN T. EDSALL, Biological Laboratories, Harvard University, Cambridge, Massachusetts, and JEFFRIES WYMAN, Middle East Science Cooperation Office, UNESCO, Cairo, Egypt. Academic Press Inc., 111 Fifth Avenue, New York 3, N. Y. 1958. xv + 699 pp. 16 × 23.5 cm. Price, \$14.00.

The rapidly growing and important field of biology which lies at the juncture of chemistry and physics as well as of biochemistry and biophysics has been given various names such as physical biochemistry and biophysical chemistry. The timely appearance of the first of a projected two volume series by Edsall and Wyman will aid materially in the growing need for suitable texts in the area of physical chemistry of biological systems. The following chapters are included: Biochemistry and Geochemistry (4% of content),

Water and its Biological Significance (3), Problems of Protein Structure (14), Thermodynamics (15), Electrostatics: its Application to Polar Molecules and Ionic Solutions (12), Dielectric Constants and their Significance (9), Conductivity of Electrolytes (3), Acid-Base Equilibria (11), Polybasic Acids, Bases, and Ampholytes, Including Proteins (11), Carbon Dioxide and Carbonic Acid (6), and some General Aspects of Molecular Interaction (12).

The authors have placed the major emphasis on the fundamentals of bio-physical-chemical systems and only a minor attention to techniques. This reflects the strength of this growing field, for as soon as a major discipline concerns itself less with techniques and more with the fundamentals of the subject under study, the contributions from this field become substantial. It has been necessary for the authors to restrict the coverage of material and in doing so they have elected to discuss those topics more "intimately" known. For this reason the authors speak with considerable authority. They will be criticized for the omission of any discussion of polynucleotides and we may hope that in the next volume some consideration can be given to this rapidly growing field of biology.

Throughout the text the "biological significance" of the principles of physical chemistry is stressed. This includes the chapter on thermodynamics which is frequently included in texts of this nature as a matter of routine. In the present instance, however, the approach to this fundamental topic has been oriented to the specific problems of the biochemist. Of considerable value are the contributions made by the authors in their discussions of such systems as the malate-fumarate equilibrium, peptide bond synthesis, and the standard free energy of hydrolysis of adenosine triphosphate. Copious examples of biological systems are used to illustrate their points, but the authors do not err in a tendency of including too much detail. Indeed, it is probably their excellent choice of illustrative material which contributes most successfully to the teaching value of this volume.

The subject matter is presented in a concise and straightforward manner, beginning in many instances with first principles. A knowledge of calculus, organic and physical chemistry is assumed. As a guide for the student a list of problems is included at the end of several chapters. The final chapter provides an excellent review of the phenomena associated with molecular interactions and of the experimental problems they present. The style of the authors provides a readable text which should give the student little difficulty. It should become a standard in classrooms, despite the over-emphasis of certain subjects and omission of others. In addition it will find a useful place in any reference library. A generous bibliography is included with each topic. As with any first edition a few typographical errors have made their way to the final copy, but these are readily recognized. A twenty page subject index is included.

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Modern Electroanalytical Methods. Proceedings of the International Symposium on Modern Electrochemical Methods of Analysis, Paris, 1957. Sponsored by the I.U.P.A.C.'s Sections of Analytical and Physical Chemistry (C.I.T.C.E.). Edited by G. CHARLOT, Professeur à l'Ecole de Physique et de Chimie industrielles de Paris. D. Van Nostrand Company, Inc., 126 Alexander Street, Princeton, N. J. 1958. 186 pp. 17 × 24.5 cm. Price, \$4.95.

This volume contains in a convenient form the papers published in "Analytica Chimica Acta" (Nos. 1 and 2, Vol. 18, 1958). These 22 papers in English, German or French were presented at the symposium organized by Professor Charlot in Paris in July, 1957. The meeting was well attended by delegates from Western Europe, the United States, the U.S.S.R., Yugoslavia, Poland, Czechoslovakia, Japan, India, Australia, etc.

The general purposes of C.I.T.C.E. are set forth in the inaugural address of T. P. Hoar. Kolthoff, in his introductory remarks, points out the significance of electroanalytical methods in the teaching of analytical chemistry.

Papers cover a great variety of electroanalytical methods. Two trends, however, can be distinguished: methods for