Book Reviews

Introduction to Liquid State Chemistry. By Y. MARCUS (Hebrew University of Jerusalem). John Wiley & Sons, Inc., New York, N.Y. 1977. xviii + 357 pp. $26.50.

This book treats a number of aspects of liquid-state chemistry, emphasizing the thermodynamics of liquid mixtures. After a qualitative introductory chapter, the second chapter covers theories of the liquid state (integral equations for pair distribution functions, hard-sphere perturbation theory, cell-hole models), and the third summarizes thermodynamic properties of different types of liquids. Chapter 4 gives a general discussion of liquid mixtures, and the last four chapters deal with specific types of mixtures: molecular fluids, electrolyte solutions, mixtures of molten salts, and liquid metals.

The coverage is much less general than the title would imply. Transport and time-dependent phenomena are not included, nor are such subjects as liquid-state chemical kinetics. The treatment of pure fluids (and especially of simple liquids) is quite brief and gives only a qualitative picture of recent theoretical and experimental developments. The thermodynamics of liquid mixtures, the primary subject of the book, is treated clearly and comprehensively, with the discussions of electrolyte solutions and molten salt mixtures being particularly timely reviews. The book should be useful to researchers and students in the field of liquid-state thermodynamics.

David W. Oxtoby, *University of Chicago*

Elements of Organic Chemistry. By H. ZIMMERMAN and I. ZIMMERMAN (New York City Community College and Bronx Community College of The City University of New York). Glencoe Press, Encino, Calif. 1977. xiv + 623 pp. $14.95.

This text was written for students in the allied health fields and biosciences and is appropriate for either a one- or two-semester survey of organic chemistry. There are 30 chapters. The first of these includes a review of the usual general chemistry principles relevant to organic chemistry as well as an introduction to the various kinds of organic chemical formulas and a brief table of functional groups. Fifteen chapters present organic chemistry via functional groups and four later chapters introduce the biochemical classes of compounds.

The material is well organized, the writing style is clear and succinct, and structural formulas are accurately drawn. Consistent with the aim of the text, functional groups are often illustrated by compounds which have biological significance. In addition to end-of-chapter problems, sample problems are interspersed within the chapters to illustrate reactions and concepts.

A serious shortcoming of the text is the absence of any organic spectroscopy. Infrared and NMR spectroscopy play such an important role in the theory and practice of organic chemistry that its omission, even in a text of this type, is not justifiable. We also find no mention of dicarboxylic acids in the text. Several of these appear in metabolic cycles and should be included.

L. Salisbury, *Kean College of New Jersey*

Hormonal Receptors in Digestive Tract Physiology. Edited by S. BONFILS, P. FROMAGEOT, and G. ROSSELIN. North Holland Publishing Co., Amsterdam. 1977. xxvii + 514 pp. $48.95.

This book represents the published proceedings of the First International Symposium on Hormonal Receptors in Digestive Tract Physiology, held in France in 1976. It is divided into five main sections, each consisting of several major manuscripts and a few one-page abstracts of free communications. The first section, titled "Chemical and Analytical Approaches to Hormone-Receptor Interaction", provides an up-to-date review of the theories and techniques used by workers in the field; emphasis is upon structure-function relationships and immunochemical methodology. Subsequent sections are concerned with specific receptors in liver, in pancreas and salivary glands, in stomach, and in bowel and gall bladder. The majority of the papers deal specifically with the interaction of polypeptide or other hormones with their receptors; the rest consider structural and functional aspects of other components in the system, e.g., the membrane matrix of the receptor, the ionic milieu about the receptor, and the microtubular system and enzymatic activities of the target cell. For the most part, comprehension of the material presented requires a general knowledge but no specific expertise in the field. Consequently, both scientists and physicians with an interest in endocrinology and/or gastrointestinal physiology can gain from this book a better understanding of contemporary research at the interface of these two disciplines.

John C. H. Steele, Jr., *Duke University Medical Center*

Carbonate Chemistry of Aquatic Systems: Theory and Application. By R. E. LOEWENTHAL and G. V. R. MARAIS (University of Cape Town). Ann Arbor Science Publishers, Ann Arbor, Mich. 1976. xi + 433 pp. $22.50.

The authors discuss their subject in seven chapters accompanied by appendices and a Fortran program listing. Almost half the text is devoted to a thorough treatment of chemical principles and an explanation of their graphical approach to problems. The remainder of the text concentrates on example solutions of problems of potential interest.

In a brief introduction the authors discuss generalities of the natural carbonate system and state their objective, an equilibrium approach to the carbonic system in natural and treated water. Chapter 2 (Basic Chemistry of low Ionic Strength Water) presents their method of graphical problem solution using species-pH diagrams. They then discuss a variety of system solutions. In Chapter 3 (Ionic Equilibria of the Carbonic Species in Water) the authors give a detailed methodology for determining the carbonate species in water using titration to measure acidity, alkalinity, and species concentration. In Chapter 4 (Equilibrium of a Solid with its Dissolved Species) the authors explicitly decide to ignore kinetic problems and concentrate their discussion on equilibrium conditions. Here they explain dissolution–precipitation phenomena and problems emphasizing Langelier's saturation index. Chapter 5 (Water Conditioning) is the longest (117 pp). It starts out with definitions of concentration and proceeds with a discussion of acidity–alkalinity–pH diagrams in water conditioning, with clearly explained examples, and goes on to discuss modified Caldwell–Lawrence diagrams. They stress the use of these diagrams in water stabilization and softening and work a large number of examples. Chapter 6 (Alkalinity–Calcium-Deficient Waters) discusses an example (using Caldwell–Lawrence diagrams) on the dosage requirements necessary to obtain desired results. Chapter 7 (Treatment for Hot Water Systems) includes a discussion and worked problems involving waters up to 90 °C (boiler waters are not discussed).

The book concludes with appendices of (A) tables for determining buffer capacity, (B) acidity–alkalinity–pH equilibrium diagrams, (C) modified Caldwell–Lawrence diagrams, and (D) a Fortran listing and description of input format for a program to plot pH–alkalinity–acidity diagrams.

The authors detail every development; there are no assumptions of prior knowledge beyond simple chemistry and no gaps to be filled in by the reader. Every symbol is defined (although there are so many one misses a table of symbols) and every term is defined; some definitions are given more than once. There are no references more recent than 1969 and over half are prior to 1960. Overall I found the book thorough and comprehensive. One must follow every step carefully as there is a minimum of chatty text and the book builds on previously worked material. Those who want a more physical-chemical approach than customary will like this book.

David N. Lumsden, *Memphis State University*