1374 (1972)]. By R. A. ABRAMOVITCH,* S. R. CHALLAND, and E. F. V. SCRIVEN, Department of Chemistry, University of Alabama, University, Alabama 35486.

On page 1375, column 1, the chemical name at the end of fifth line of text below the structures in the middle of the page should read *N*-pentafluorophenyl-1*H*-.

Synthetic Spectroscopic Models Related to Coenzymes and Base Pairs. An "Abbreviated" Nicotinamide Adenine Dinucleotide [*J. Amer. Chem. Soc.* **94,** 1702 (1972)]. By JOHN A. SECRIST III and NELSON J. LEONARD,* School of Chemical Sciences, University of Illinois, Urbana, Illinois 61801.

Both "abbreviated" NAD^+ derivatives show hypochromism. The legend to figure 1 should read: (Left) Ultraviolet spectra of 5′-(3-carbamoylpyridin-1-ylium)-5′-deoxy-2′,3′-*O*-isopropylideneadenosine chloride (**1**) (----) *vs.* the sum of 2′,3′-*O*-isopropylideneadenosine (**5**) and methyl 5′-(3-carbamoylpyridin-1-ylium)-5′-deoxy-2′,3′-*O*-isopropylidine-β-D-ribofuranoside chloride (**3**) (———). (Right) Ultraviolet spectra of 5′-(3-carbamoylpyridin-1-ylium)-5′-deoxyadenosine chloride (**2**) (·····) *vs.* the sum of adenosine (**6**) and methyl 5′-(3-carbamoylpyridin-1-ylium)-5′-deoxy-D-ribofuranoside chloride (**4**) (-×-×-).

Hydrogen Bond Interactions with Sulfur Donors [*J. Amer. Chem. Soc.*, **94,** 1848 (1972)]. By A. D. SHERRY and K. F. PURCELL,* Department of Chemistry, Kansas State University, Manhattan, Kansas 66502.

In the sixth line of footnote 15, the word "less" should be "greater."

Mercury(II)- and Thallium(III)-Catalyzed Hydrolysis of Isopropenyl Acetate [*J. Amer. Chem. Soc.*, **94,** 1985 (1972)]. By PETER ABLEY, JAMES E. BYRD, and JACK HALPERN,* Department of Chemistry, The University of Chicago, Chicago, Illinois 60637

Reference 10 should read: L. L. Schaleger and Z. Garcia, *J. Chem. Soc. D*, 373 (1971).

Book Reviews

Surface and Colloid Science. Volume 4. Edited by EGON MATIJEVIC. John Wiley and Sons, New York, N. Y. 1971. vii + 495 pp. $24.95.

Matijevic's series, now in its fourth volume, is a very valuable contribution to the physical chemistry of surface and colloidal systems. The series gives somewhat more emphasis to theoretical than to experimental discussions. This is probably a reflection of the fact that the field has reached the stage where intensive theoretical treatments are worth the effort.

The first chapter, on "Computer Simulation of Colloidal Systems," by A. I. Medalia, is a review of recent work using a method that was initated by students of polymer solutions. The method is currently being employed to explain the important phenomenon of stabilization of a colloidal dispersion by extended adsorbed polymer molecules, or "entropic repulsion." The same mathematical techniques are applicable to flocs and sediments; and questions of the size, shape, and porosity of such aggregates are shown to be tractable by a kinetic, probablistic method. These problems (entropic repulsion and aggregate configuration) are well beyond the powers of physical chemistry's "classical" methods.

Pierotti and Thomas have written a chapter on "Physical Adsorption: The Interaction of Gases with Solids." Though fairly long, nearly 170 pages, it is particularly intensive in its treatment of a set of topics which are now moderately clearly understood: the interactions of fairly simple molecules with several well-defined solids. They open with a review of classical and statistical thermodynamics of physical adsorption, and follow with a discussion of intermolecular forces. In the latter subject, they review both pairwise-additive treatments, and the treatments in which the solid is treated as a single system, and also the work of Pitzer and Sinanoglŭ in which the interaction of adsorbed molecules is treated. (I have not, as yet, seen a discussion in which the Lifshitz method is used successfully for interactions between semiinfinite solids with slab–slab separations that are of molecular dimensions.) Next they give a short but excellent review of the pertinent experimental methods. The balance of the chapter is an extensive discussion of the theory of the low-coverage region, a slightly shorter discussion of the region up to monolayer coverage, and a brief review of multilayer theory.

Gill, Derzansky, and Doshi have written a 100-page chapter, "Convective Diffusion in Laminar and Turbulent Hyperfiltration (Reverse Osmosis) Systems." This is a much-needed engineering analysis, which signals a certain state of maturity of the subject. That is to say, on a molecular level the process is fairly well understood, and reasonable satisfactory membranes are available. The next step is engineering scale-up of reverse osmosis, as technological process. Such scale-up requires that mathematical models be proposed and analyzed. Gill and his coworkers have done just this; and their contribution is original, and not a mere review, though it contains a very adequate review of the subject right up to the manuscript date. The treatment will be of great value for the advancement of reverse osmosis as a practical process.

H. Ti Tien writes authoritatively on "Bimolecular Lipid Membranes." This paper is an amplification and up-dating of a review which was written in 1968, in a publication that does not commonly come to the attention of workers in surfaces and colloids. Techniques of forming the membranes are discussed, together with optical and mechanical methods and some results on electrical properties. Diffusion is discussed, and results as to water permeability are reported. Thinning of the film and stability are also covered. A bibliography is given with 321 entries, through 1970.

Robert J. Good, *State University of New York, Buffalo*

Analytical Photochemistry and Photochemical Analysis. Solids, Solutions, and Polymers. Edited by J. M. FITZGERALD (University of Houston). Marcel Dekker, New York, N. Y. 1971. xiv + 360 pp. $23.50.

This book reviews with a practical emphasis applications of photochemistry to a variety of chemical analysis problems. It is written at a level such that anyone who is familiar with elementary analytical and physical chemistry should be able to follow the text. Involved mathematical developments are relatively infrequent. Numerous references and practical hints and evaluations are included for the benefit of those who are seeking to evaluate the suitability of the methods included for the solving of particular problems. A number of typical graphs, illustrations, and diagrams are included. This book should be of interest to chemists and students who are seeking to gain an overall view of modern photochemical analysis techniques. Areas suggested as needing further development could be the basis of research problems. Polymer chemists should be interested in the detailed treatment of photodegradation of polymers. Analytical chemists who are responsible for the selection or development of new analytical procedures will especially appreciate the practical treatment of the topics.

The book is divided into three parts. The first part includes a review of principles and surveys photochemical equipment. Suitable wavelengths, sources, optical materials, and reaction vessels are described. The principles behind the design and use of several types of lasers are considered, and analytical applications of the laser in Raman spectroscopy, absorption spectroscopy, emission spectroscopy, and other areas are described. The development of actinometry is traced, and practical applications are outlined in some detail.

Part II considers the use of photochemistry in analytical determinations. History, theory, and practical methods such as titrations with internally and externally generated reagents are covered.

Part III is devoted to describing the experimental applications of photochemistry in practical investigations. Emphasis is placed on problems associated with polymers from the standpoint of characterization and stability studies.

William J. Husa, Jr., *Middle Georgia College*

Sulfur in Organic and Inorganic Chemistry. Volume I. Edited by ALEXANDER SENNING (Aarhus University). Marcel Dekker, New York, N. Y. 1971. xii + 380 pp. $33.00.

This first volume of a series provides a useful review of the chemistry of various types of sulfur bonding which will be applicable in all areas of chemistry. The subject is covered in reasonable detail and, with the references provided, will be an excellent review of many aspects of sulfur chemistry, and should be considered by all serious workers in sulfur chemistry or associated areas. The stated aim of the book, to familiarize inorganic and organic chemists with each other's areas, has been carried out successfully. Both will gain by reading it.

Despite the title, the first volume does not contain a section on the sulfur to *carbon* bond, nor are such sections proposed in succeeding volumes. However, this is perhaps to be expected in view of the size of the field. In any case, the other sections deal with many aspects of this, and the proposed contents of later volumes promise to make this series of books highly attractive to the organo sulfur chemist.

David M. McKinnon, *University of Manitoba*

Photochemistry. By R. B. CUNDALL (University of Nottingham) and A. GILBERT (University of Reading). Appleton-Century-Crofts, New York, N. Y. 1970. 220 pp. $10.95.

This text is a lightweight treatment of the subject that covers the essentials and selected topics. After an introduction, successive chapters deal with energy states and processes involving atoms, simple and polyatomic molecules, and singlet and triplet states. Chapters 7–11 emphasize dynamic aspects and cover dissociation processes, photoaddition reactions, rearrangements, substitutions, and photoredox reactions. The section on photooxidation is dated, and listing triplet energies in kilojoules is irritating. A problem set and limited references end each chapter. The numerous mathematical formulas in the earlier chapters do not detract from the ease of reading.

G. D. Mendenhall, *National Research Council of Canada*

Chemical Thermodynamics. By D. J. G. IVES (Birkbeck College, London). Macdonald and Co. Ltd., London. 1971. viii + 203 pp.

Thermodynamics for the undergraduate can often be a stultifying experience. The purposes of this book are to enlighten the undergraduate who is unconvinced of the importance of this area of science and to present this subject in a palatable way; it is indeed successful in both respects. This book is filled with examples of thermodynamics in chemistry; it is written in a most informal and unpretentious manner, and it develops the subject in an unconventional but certainly not unsatisfying order.

The first subjective chapter deals with the thermodynamic "driving force" and with kinetics. The significance of entropy and enthalpy in chemical reactions is clearly described. The relation between thermodynamics and kinetics is over-simplified; the relations which are derived are true only for a few very simple reactions. The next two chapters, which deal with thermochemistry and entropy, contain numerous examples drawn from inorganic and organic chemistry; the interpretations and explanations of these examples are particularly interesting. Equilibrium and standard states are discussed in the fifth chapter. The author leaves these two areas in great confusion—at least to this reviewer. The important problems of choice of a standard pressure, the equilibrium constant, and equilibrium among solid phases are not fully resolved. The final chapter deals with molar properties, solution chemistry, and other potential functions. It is a clear presentation of these areas and the problems that are encountered when one is forced to discuss real systems.

This book would be appreciated by an undergraduate in his last year. It presumes familiarity with a large body of chemical, thermodynamic, and statistical mechanic information. It unfortunately does not touch on the area of chemistry in biological systems, a field attracting more interest in undergraduate studies in recent years.

Graham Morrison, *St. Olaf College*

The Yeasts. Edited by A. H. ROSE (Bath University) and J. S. HARRISON (The Distillers Co. Ltd.). Academic Press, London and New York. Volume I: 1969. xiv + 508 pp. $19.50. Volume II: 1971. xiv + 571 pp. $24.50. Volume III: 1970. xiv + 590 pp. $27.50.

This three-volume series should be of interest not only to specialists in the study of yeasts, but microbiologists and chemists as well.

Volume I deals extensively with taxonomy and systematics, distribution in nature, pathogenic forms, yeast associations, cytology, sporulation and hybridization, genetics, and life cycles.

Volume II, which should be of particular interest to biochemists, contains chapters on yeast nutrition and solute uptake, kinetics and energetics of growth, influence of temperature on growth and metabolism, structure and biosynthesis of the cell envelope, lipids and membranes, energy yielding metabolism, properties and composition of yeast nucleic acids, nucleic acid and protein syntheses, structure and biosynthesis of storage carbohydrates, biochemistry of morphogenesis, and carotenoid pigments.

Volume III, devoted to yeast technology, includes discussions of wine and cider making, brewer's and sake yeast, yeasts in distillery practice, baker's and food yeasts, yeasts as spoilage organisms, and a final chapter discussing miscellaneous products such as enzymes, growth factors, carbohydrates, and lipids, to name a few.

The problems involved in culturing yeast for various industrial processes are discussed, and examples of commercial production methods are presented. Most chapters contain numerous tables of yeast species involved and compounds produced. For example, a comprehensive list of the components of distilled spirits and fusel oils is included as an appendix to the section on yeasts in distillery practice.

Extensive bibliographies are to be found at the end of each chapter. The text is, in general, very well written and makes pleasant reading.

M. W. Smith, *University of Michigan*

The Chemical Analysis of Food. By D. PEARSON (National College of Food Technology, University of Reading). Chemical Publishing Co., Inc., New York, N. Y. 1971. xii + 604 pp. $16.50.

This book includes general, alternative, and some new methods for food analysis. The standard analytical procedures described are for the determination of moisture, ash, nitrogen, crude protein, fat, crude fiber, calcium, and phosphate content of foods. There are also methods for measuring additives and contaminants such as preservatives, antioxidants, coloring matters, emulsifiers, stabilizers, solvents, trace elements, and pesticide residues. Individual chapters are devoted to the analysis of the following foods: sugars, preserves, cereals, starch products, baking powders, eggs, salad cream, fruit, vegetable products, beverages, herbs, spices, fermentation products, flesh foods, table jellies, dairy products, oils, and fats. The final chapter provides a summary of the food laws of England and Wales. The appendices contain useful information on preservatives, food additives, and the recommended daily intakes of energy and nutrients for the United Kingdom.

This book should be of interest to analytical and food chemists in research and industry. It should also prove valuable for laboratory courses in food chemistry.

Victoria F. Thiele, *Syracuse University*