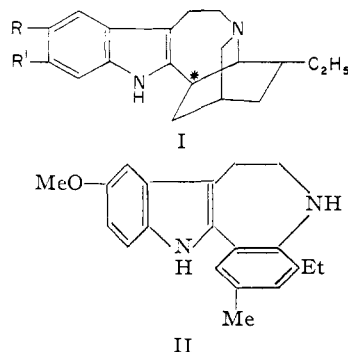


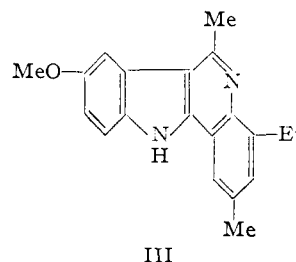
was found to be identical in all respects with the compound obtained from ibogamine.

It is possible that the work reported here and the



(9) It is of interest to note that Robinson's hypothetical "dihydro-ibogaine" ("Structural Relations of Natural Products," Clarendon Press, 1955) is closely related to this structure. A seven-membered ring C for ibogaine was also a feature of the earlier proposal, ref. 6.

structure Ia⁹ derived for ibogaine may prove applicable to the group of indole alkaloids which are known to furnish 3,5-dialkylpyridines by drastic methods of degradation.



a: R = OMe, R¹ = H
b: R = H, R¹ = OMe
c: R = R¹ = H

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BOOK REVIEWS

Introduction to Solid State Physics. Second Edition. By CHARLES KITTEL, Professor of Physics, University of California, Berkeley, California. John Wiley & Sons, Inc., Publishers, 440 Fourth Avenue, New York 16, New York. 1956. xvii + 617 pp. 16 × 23 cm. Price, \$12.00.

This book is the first volume in a new series on the science and technology of materials. It is intended as an introductory textbook in solid state physics for students of physics, chemistry, and engineering. The second edition is about two hundred pages longer than the first and is superior, both in the clarity of the explanations and in the extent of the material. A good general knowledge of physics and mathematics is required for complete understanding of the argument, but the non-mathematical reader will find a large amount of interesting and helpful information. Although the chemical topics of heterogeneous catalysis, thermal and photochemical decomposition, and adsorption are neglected, the neglect is compensated by a thorough discussion of the topics that are included and by excellent references at the end of each chapter.

The sections on the classification of solids and on crystal structure have been greatly expanded and clarified by the use of two-dimensional crystal models. The discussions of lattice energy, lattice vibrations, elastic constants, heat capacity, thermal and dielectric properties, ferroelectrics and diamagnetism and paramagnetism are essentially unchanged. However, they have been modernized and recent data are included.

The free electron theory of metals and the band theory of solids are introduced relatively early in the book and they are used to explain the properties of metals, alloys, insulators and semiconductors. Again, the theoretical discussion is supplemented by two-dimensional models. New information about cyclotron resonance and transistor manufacture is included.

The discussion of ferromagnetism, antiferromagnetism and superconductivity has been modernized and placed after the theoretical sections.

The description of imperfections in solids has been rewritten. The discussion of lattice vacancies, diffusion, color centers and excitons is improved. The problem of

describing three-dimensional dislocation structures with two-dimensional pages has been reasonably well solved, and several striking pictures of dislocation phenomena have been included.

Occasionally, some humor enlivens the grim procession of solid state phenomena. The author describes the difference of e^{-3000} between the experiments of Volmer and Schultze and the theory of growth of ideal crystals, and then states, "This has been referred to as an all-time record for disagreement between observation and theory." At another point, he reports, "The highest surface recombination velocities are found for sand-blasted surfaces; the lowest velocities are found for surfaces polished smooth and then etched with empirical solutions. A certain amount of magic is thought to be involved in a good etch." This is a real challenge to the chemist to help the physicist.

The new series on materials begins well. If succeeding books maintain the high standards set by this one, they will be a valuable addition to the library of every chemist who is interested in solids.

RESEARCH LABORATORIES
EASTMAN KODAK COMPANY
ROCHESTER 4, NEW YORK

GEORGE W. LUCKEY

pH Measurements. Their Theory and Practice. By VICTOR GOLD, B.Sc., Ph.D., Reader in Physical Organic Chemistry, King's College, University of London. John Wiley and Sons, Inc., 440 Fourth Avenue, New York 16, N. Y., 1956. 125 pp. 11 × 17 cm. Price \$2.25.

This little monograph covers quite thoroughly the subject of pH measurements, particularly from the theoretical side. It discusses the theory of proton transfer equilibria, of galvanic cells, the definition and interpretation of the pH scale. The determination of pH by potential measurements and by optical methods is described. There is a discussion of pH relations in the ionization of acids and bases, including titrations of strong and weak acids and bases. Buffers are also discussed. The relation between pH and reaction ve-

locities is considered. One chapter is devoted to measurements in non-aqueous solvents.

The author states in the preface that the book is intended primarily for non-specialists. A large amount of information has been condensed into a small book. The treatment of pH is rigorous and the reviewer doubts that a person with only a small background of physico-chemical theory will find it as useful as the author hopes.

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HOBART H. WILLARD

Advances in Enzymology and Related Subjects of Biochemistry. Volume XVII. Editor: F. F. NORD, Fordham University, New York, New York. Contributors: R. H. ALBERTY, University of Wisconsin, Madison, Wisconsin; B. AXELROD, Purdue University, Lafayette, Indiana; B. CHANCE, University of Pennsylvania, Philadelphia, Pennsylvania; S. J. COOPERSTEIN, Western Reserve University, Cleveland, Ohio; A. G. DE BUSK, University of Texas, Austin, Texas; E. C. DE RENZO, Lederle Laboratories, American Cyanamid Company, Pearl River, New York; J. EDELMAN, Imperial College of Science and Technology, London, England; R. JEENER, University of Brussels, Brussels, Belgium; H. R. MAHLER, Indiana University, Bloomington, Indiana; I. MANDL, Columbia University, New York, New York; C. NEUBERG, New York Medical College, New York, New York; W. W. WAINIO, Rutgers University, New Brunswick, New Jersey; G. R. WILLIAMS, University of Toronto, Toronto, Canada. Interscience Publishers, Inc., 250 Fifth Avenue, New York 1, New York. 1956. vii + 556 pp. 16 × 23.5 cm. Price \$11.00.

The most recent volume of this well known series contains a number of notable reviews.

A lucid account of the situations most frequently encountered in the interpretation of the kinetics of enzyme-catalyzed reactions is given by Alberty. The general discussion, which is characterized by its restraint and avoidance of complicated reaction representations whose consideration at the present time can be no more than a demonstration of facility in algebraic manipulation, will be welcomed by many investigators who are seeking a summary of the more common representations with their corresponding rate equations expressed in terms of a consistent set of symbols. This article also contains a brief description of the kinetic behavior of six enzyme systems, *i.e.*, alcohol dehydrogenase, cholinesterase, α -chymotrypsin, fumarase, peroxidase and urease, that have been studied more or less extensively in recent years.

Chance and Williams have provided a welcome summary of their views on the functions of the respiratory chain in terms of spectroscopically detectable electron transport components of intact mitochondria, on how the process of respiratory control can be used to localize sites of energy conservation, on possible mechanisms for the conservation and phosphorylation processes and how such mechanisms can operate in isolated mitochondria, in intact cell suspensions or in solid tissue. The fluid and controversial nature of interpretations in this area of enzymology is emphasized by the timely and well documented article of Wainio and Cooperstein entitled "Some Controversial Aspects of the Mammalian Cytochromes" appearing later in the same volume.

Surveys of the present status of two important types of enzyme-catalyzed processes, *i.e.*, phosphate transfer and the formation of oligosaccharides *via* transglycosylation are provided by Axelrod and Edelman, respectively. Each of these articles is presented in a critical vein and they are valuable additions to the literature of enzyme chemistry.

Mahler has considered the nature and functions of the metalloflavoproteins and De Renzo the chemistry and biochemistry of xanthine oxidase. Both provide an authoritative account of two areas of enzymology that are in an early stage of development.

Of the remaining three chapters only that of Jeener on

"Ribonucleic Acids and Virus Multiplication" appears to be of stature comparable to those noted above. The article by Mandl and Neuberger entitled "Solubilization, Migration and Utilization of Insoluble Matter in Nature" clearly belongs to an earlier period of chemistry and De Busk's review of the "Metabolic Aspects of Chemical Genetics" appears inadequate when compared with many recent reviews of this currently popular field.

The practice, initiated with Volume II of this series, of providing both author and subject cumulative indices is continued in the present volume.

GATES AND CRELLIN LABORATORIES OF CHEMISTRY
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Methods in Enzymology. Volume III. Preparation and Assay of Substrates. Edited by SIDNEY P. COLOWICK and NATHAN O. KAPLAN, McCollum-Pratt Institute, The Johns Hopkins University, Baltimore, Maryland. Academic Press Inc., 111 Fifth Avenue, New York 3, N. Y. 1957. xxiv + 1154 pp. 16 × 24 cm. Price, \$26.00.

This volume is divided in the following sections: I, Carbohydrates; II, Lipides and steroids; III, Citric acid components; IV, Proteins and derivatives; V, Nucleic acids and derivatives; VI, Coenzymes and related phosphate compounds; VII, Determination of inorganic compounds. The seven sections contain one hundred and fifty procedures which were used by the authors in their investigations. This type of presentation no doubt offers the most desirable results. Occasionally, however, there is evidence of incompleteness, perhaps because of an author's limited interest. For example, on p. 334 the preparation of lecithin from beef hearts is described. It is stated that the $BaCl_2$ -precipitate can be processed for cardiolipin but no directions are given for the procedure. Cardiolipin is also an important product since both compounds are employed in certain serological tests for syphilis. While much useful detail is presented on lecithin, nothing is said about cardiolipin.

On p. 414 a method for the determination of α -keto acids is described. This method has been in use for many years. It may be of interest, however, to note that Neish (*Rec. trav. chim.*, 72, 105 (1953)) has shown recently that the 2,4-dinitrophenylhydrazones of α -ketoglutaric acid and pyruvic acid may be separated by paper electrophoresis. In this method the separated nitro compounds, after extraction from filter paper, are reduced in acid solution and estimated by polarography. The electrophoretically separated hydrazones may also be determined colorimetrically (Tauber, *Anal. Chem.*, 27, 287 (1955)).

The reviewer notes with regret that the modern scientist at times is oversimplifying his method of writing. For example, on p. 334 "The cadmium-free chloroform solution is evaporated to dryness and taken up in 180 ml. of anhydrous ether," when what is meant is that the residue is taken up in ether. On the same page the term "amount" is used several times when volume and quantities were intended. On p. 416 and p. 417 one is directed to "incubate" samples for coupling of α -keto acids with hydrazine at $25 \pm 2^\circ$. What is really meant is to place the samples in a water-bath at $\pm 2^\circ$ for a certain number of minutes. Many enzymes, coenzymes and substrates which are difficult to prepare are now commercially available at reasonable prices. Mention should have been made of this fact more extensively in the individual contributions.

There is no serious defect in this extremely important volume. Editors, authors and publisher rendered a great service to biochemistry for making the appearance of these volumes possible.

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