

## BOOK REVIEWS

**Polyamino Acids, Polypeptides, and Proteins.** Proceedings of an International Symposium held at the University of Wisconsin, 1961. Edited by MARK A. STAHMANN. The University of Wisconsin Press, 430 Sterling Court, Madison 6, Wisconsin. 1962. 18 × 26 cm. 394 pp. Price, \$8.00.

The papers assembled in this volume cover a broad cross section of the field of polypeptide and protein chemistry. There are six articles dealing with the synthesis and properties of polyamino acids and polypeptides, three on the kinetics of polymerization of N-carboxyamino acid anhydrides, eleven on the properties of polyamino acids in solution, five on polypeptide and protein structure, and eleven papers on the biological properties of polyamino acids. The discussion sections also serve a useful purpose in pointing up conflicts in interpretation of physical data. There is an excellent analysis of the relative merits of optical rotation and absorption in the deep ultraviolet as tools for the measurement of degree of helicity in polymers. The interesting properties of  $\alpha$ -,  $\beta$ -, and  $\gamma$ -linked polymers of aspartic and glutamic acids are reviewed. The unusual linkages have been recently implicated in the structure of proteins such as collagen.

The format of the book is attractive, and there is a good index. Only four misprints were detected. There is little doubt that "Polyamino Acids, Polypeptides, and Proteins" will be an excellent supplement to earlier reviews of the field by Bamford, Elliott, and Hanby, and Katchalsky and Sela, and will be welcomed and widely used by protein chemists.

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**Die Kinetik der Wirkung von Effektoren auf Stationäre Fermentensysteme.** By HANS-DIETER OHLENBUSCH, Privatdozent für Physiologische Chemie an Der Universität Kiel. Springer-Verlag, Heidelberger Platz 3, 1 Berlin 31 (Wilmersdorf). 1962. 13.5 × 20.5 cm. 36 pp. Price, DM 9.80.

It is now generally recognized that the linear relations observed between rate and concentrations for many enzyme systems do not necessarily follow from the kinetic models used. In particular, for a system containing enzyme, E, substrate, S, and inhibitor or activator, I, which can form three complexes, ES, EI, and ESI, and which can lead to products from the decomposition of both ES and ESI, the general steady-state equation does not predict a linear relation between a simple function of rate and S or I concentration.

In order to explain linear plots of  $1/v$  vs.  $1/s$  it is necessary to pick a particular limiting case or else to derive the cumbersome general steady-state rate equation and see which factors can result in simplification. An analysis of the latter kind was carried out by Botts and Morales, in 1953, and is now extended by Ohlenbusch. He considers not only the limiting cases corresponding to "quasi-equilibrium" among complexes and classical inhibition types (competitive, noncompetitive, and uncompetitive) but also other combinations of individual rate constants which can result in linear plots. He concludes that the observation of a constant maximum rate and increased Michaelis constant upon addition of inhibitor probably results only from competitive inhibition, but that the other classical limiting cases can arise from a variety of causes.

This small volume discusses a very limited topic thoroughly. It is more like a theoretical paper one might expect to find in a journal, rather than like a full scale monograph. Most of the material is also available in an assortment of papers written in English.

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**Handbuch der Physik. Band XIII. Thermodynamik, der Flüssigkeiten und Festkörper.** By S. FLÜGGE. Springer-Verlag, Abteilung VI, 1 Berlin-Wilmersdorf, Heidelberger Platz 3, West-Berlin. 1962. 17 × 25.5 cm. 679 pp. Price, SM 198.

This volume of "The Handbook of Physics" contains only three articles. The first, by Münster, is itself of book length. This article has excellent discussions of the statistical theory of liquids and cooperative phenomena in crystals and of mixtures. As might be expected, there is great similarity with Professor Münster's earlier book on statistical thermodynamics, but much new material has been added. For example, there are accounts of the

DeBoer cell cluster theory, the corresponding states theories of mixtures, an excellent treatment of ordering in solid solutions, etc. Surprisingly, there is relatively little overlap with the article by J. E. Mayer in the Handbook volume dealing with the thermodynamics of gases. It is too bad that the publication of the volume could not have been delayed a few months to allow amendment of the article: there are now available numerical solutions of the hypernetted chain and Percus Yevick equations which should be compared with the earlier theories of Kirkwood and Born and Green.

The second article by Staverman is much shorter and more nearly of the detailed review article style. It gives very good coverage of a wide variety of topics in polymer chemistry. I found the discussion of the relationship between the James and Guth and Flory theories of rubber elasticity particularly good.

The final article by Stevels deals with glass, a subject with which I am relatively unfamiliar. As nearly as I can judge, the coverage is extensive and the discussion of the relationship between the various structural theories (such as that of Zachariasen) and experiment is lucid. Anyone interested in the statistical thermodynamics of liquids and solutions (including solid solutions) would be well advised to obtain this volume for Münster's contribution alone. The articles on polymers and on glass are also very good and merit the attention of workers in these fields. The only caveat I can enter relates to the title of the volume. It is not at all clear to me that these three contributions constitute a representative description of the thermodynamics of condensed systems. Be that as it may, this volume is heartily recommended to all those whose interests touch upon the subjects considered.

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**Methoden der Organischen Chemie. (Houben-Weyl). Vierte Völlig Neu Gestaltete Auflage.** Herausgegeben von EUGEN MÜLLER, Tübingen unter Besonderer Mitwirkung von O. BAYER, Leverkusen, H. MEERWEIN, Marburg, and K. ZIEGLER, Mülheim. Band XII/1. Organische Phosphorverbindungen Teil 1. George Thieme Verlag, Herdweg 63, Stuttgart N. Germany, 1963. 18 × 26 cm. lxxii + 683 pp. Moleskin DM 166; Vorbestellpreis DM 149.40.

Not so many decades ago, phosphines and phosphonium compounds were noted mainly for their unpleasant qualities and for their value in illustrating the analogical consistency of the 5th group of the periodic table. In the currently appearing XIIth volume, 1st half, of the 4th edition of Houben-Weyl's "Methoden," as many as 40 pages are devoted to critical discussions and detailed descriptions of preparative procedures designed to make a variety of alkyl- and arylphosphines; of a sample of one hundred references taken from that section, 78 cited reports that had appeared after 1930 and the remaining 22 had been published before 1900. The preceding remarks call attention to the explosive growth of the field of organic phosphorus compounds, stimulated by new areas of theoretical interest, and a host of practical applications ranging from potent biological agents like insecticides, nucleotide coenzymes, and nucleic acids to flame-proofers, plasticizers, polymers, and lubricants.

The editors were both wise and fortunate in enlisting the collaboration of Dr. K. Sasse of Leverkusen to write the present volume of the compendium. The great diversity of phosphorus compounds necessitated strict systematization achieved by grouping according to compound type. Such a classification prevents the direct juxtaposition of similarities and analogies between and among representatives of different groups—a drawback minimized by the extensive cross-references and over-all continuity attributable to the unifying effect of one-man authorship.

Coverage is in keeping with the high standards of the previous volumes, as is the format. Readers will note that the book at hand is the first of two sections constituting Volume XII and is devoted to compounds that contain at least one C-P bond; whereas Part XII-2 is expected to treat derivatives of phosphorus and phosphoric acid, including, of course, the various phosphate esters that are of key importance in life processes.

A large fold-out table at the end of the volume grants rapid access to the nomenclature adopted (which differs slightly, for linguistic reasons, from that recommended by the I.U.P.A.C.) and to the classification of compounds by the criteria of formal valence, number of P-C and of P-O bonds. Moreover, chapters treating of a given class are indicated, greatly facilitating rapid