

ration and analysis of polyesters are included and, in a few cases, flow diagrams of commercial practice. The interpretation and importance of the functional relationships of the many variables involved are amply illustrated by many graphs and figures (203) and tables of data (177) quoted verbatim from the literature.

As stated in the Preface to the English Edition, "We wrote the book 'Polyesters' on the basis of our many years of personal experience of scientific research work in the field of polyesters and a wide coverage of the relevant scientific literature. We set out to give the most detailed possible, and where necessary, critical account of the results both of our own work and that of other investigators." This has been accomplished. Polyesters of all types are discussed in a cohesive manner including linear, branched, crosslinked, and mixed systems. A thorough review is given the chemistry and mechanisms of the polycondensation reaction including the role of such destructive processes as esterolysis, alcoholysis, and acidolysis. These exchange and chain cessation reactions are related to the polydispersity obtained in the resulting polymer. The influence of these reactions is shown to result in molecular weight distributions different from those predicted from the theory for the "most probable distribution." Unfortunately it is not clear whether the polydispersity of polyesters made by continuous processes are included in this discussion. Preparative methods, analytical procedures, and physical and chemical properties are covered. The detail given to explanations of physical and structural properties and their measurement and the interpretation of the results are particularly noteworthy. Various investigators in the field of polyesters will find several items with which to take issue with the authors, but this is no serious detraction from the general over-all excellence of the work presented.

In spite of the extensive scope of the book, it does have several shortcomings. The major portion of the material presented is now at least 10 years old as it was written earlier for distribution in the USSR. Literature references are cited only to 1956 except for the revision of the last chapter (Polyarylates) which covers polycarbonates, etc., to 1960. In the 10 years not covered by the book, many new industrial methods of manufacture, new polyesters of commercial importance, and new structural interpretations and concepts have appeared in the patent and scientific literature. The most glaring shortcoming is the lack of reference, with a few exceptions, to the information available in the patent literature of the time. Usually, important technical information on polyesters is covered first in patents and only appears later in the scientific literature. As a result, the changes brought about by various orientation and heat treatments of films and fibers with their concomitant structure and property modifications are not discussed.

In a book of this magnitude (more than 1000 references are cited) errors usually occur. This reviewer has noted several instances where data were attributed to the wrong authors, names misspelled, and tabular data labeled incorrectly. Nevertheless, this book serves the very useful purpose of bringing together, in very readable form, a voluminous amount of factual information on a subject of considerable commercial importance gathered from the experience of many investigators.

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Radiochemical Survey of the Elements. Principal Characteristics and Applications of the Elements and Their Isotopes. By M. HAISSINSKY, Scientific Director, Laboratoire Curie, Centre National de la Recherche Scientifique, Paris, and J.-P. ADLOFF, Professor of Nuclear Chemistry, Centre de Recherches Nucleaires, Strasbourg-Cronenbourg (Bas-Rhin). American Elsevier Publishing Co., Inc., 52 Vanderbilt Ave., New York, N. Y. 1965. viii + 177 pp. 15.5 × 23 cm. \$12.00.

The contents and format of this survey are well described by the original French title as a radiochemical "dictionary" of the elements. A one- or two-page discussion is devoted to the nuclear, chemical, and physical properties of each of the elements. Properties covered include: discovery of the element and derivation of its name; naturally occurring isotopes and their abundances; half-lives and radiations of some of the radioactive isotopes (particularly those convenient as tracers or in activation analysis); the electronic configurations, oxidation states, chemical reactions, and compounds of the element and their principal uses; some geochemical data including important minerals and crystal and cosmic abun-

dances; and brief mention of any unusual nuclear or chemical properties.

I wonder for whom this book was intended (especially at its price!). Scientific workers would be frustrated by the lack of references or an index. Much of the data could have been better presented in tabular form. Standard nuclide charts, for example, contain essentially all of the nuclear data given in the book (and they are free). Instead of grouping the elements in some scientific way, the authors have arranged them alphabetically. The style of the book is not well suited for the elementary chemistry student or curious layman. It does not lend itself to cover-to-cover reading nor does it convey the excitement and historical interest that may be gained from books on the discovery of the elements.

The coverage is up to date, including such recent topics as ^8He , rare-gas compounds, and element 104. Some rather interesting phenomena, e.g., delayed-neutron and -proton emission, were ignored. There are few serious errors although the presentation of some topics is confusing. The translation is generally good with occasional lapses such as " α -filiation" instead of " α -decay" and "retrodifffusion" for "back-scattering."

On the general subject of translations, including this one, I am left very puzzled. Why are publishers so anxious to do them? I can think of very few (and here I would include Professor Haisinsky's major radiochemical classic) that were worth the effort. Although not true for the case in point, the books are generally out of date by American standards when originally written and are certainly so by the time they are translated. Can't the publishers find more discriminating scientific consultants?

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Interpretation of Organic Spectra. Edited by D. W. MATHIESON, The School of Pharmacy, London University, England. Academic Press Inc., Ltd., Berkeley Square House, Berkeley Square, London W.1, England. 1965. ix + 179 pp. 16 × 23.5 cm. \$7.00.

With a few reservations, this is a book which can be recommended to advanced undergraduate and postgraduate students who need to develop and exercise their knowledge of spectroscopy in relation to organic chemistry. "Interpretation of Organic Spectra" is composed of three sections devoted successively to problems in the application of nmr, infrared, and mass spectral methods in structural analysis.

The longest section, by J. A. Elvidge, is excellent. With a limited knowledge of nuclear magnetic resonance spectroscopy the reader is led through a succession of examples for which the analysis of the spectrum is clearly and concisely written. The examples chosen increase in complexity and are used to develop broadly many aspects of nmr spectroscopy. Correlation tables of proton magnetic resonance frequencies and coupling constants with structure follow, and the section is rounded off with six unknowns for consideration by the reader. For one of these unknowns, number 5, the solution given is incorrect and should have an additional methyl group α to carbonyl. The footnote referred to on page 20 is on page 12 and not page 11. Perhaps the only disconcerting feature to the reader will be the variable use of sweep offset which could have been noted more distinctively through the use of heavy print. If the use of offset is not noticed early on, then confusion reigns, since there is no indication on the reproduced spectra. However, these are relatively minor points in a first-class exposition. Dr. Elvidge is to be congratulated on his section.

The second section was well written by four contributors (J. K. Brown, K. J. Morgan, C. J. Timmons, and D. Whiffen). They have succeeded in presenting useful applications of infrared spectroscopy while avoiding the common fault of several texts in that they stress more clearly than usual the very definite limitations of the method. The latter point is apparent from the nine examples chosen and from the six unknowns. The tentative nature of many assignments is commendably indicated, though one would still like to see a positive statement that the dependence of the organic chemist upon infrared spectroscopic structural analysis has been reduced by the advent of nmr. This is particularly true for any functional group containing a proton. Students need to be clearly told that a complete structure is seldom arrived at from infrared spectroscopy alone.

The third section, by A. Quayle and R. I. Reed, is the least satisfactory. Half of the five-page introduction to mass spectrometry is devoted to a consideration of the "z-number" classification, a concept which is utilized in discussion of half of the ten spectra presented. This concept is not widely used, and many teachers will find it very curious that this concept is included while there is no mention of the half-arrow notation to denote a one-electron shift. Furthermore, there is very little to indicate that any work on the mechanism of fragmentation has taken place. None of the extensive work of Biemann or Djerassi is referred to in the text, though these key workers in mass spectroscopy are recognized in the bibliography.

The reviewer is of the opinion that a need still exists for one or more additional works in which the advantages and limitations of each spectroscopic method are *comparatively* assessed through their *combined* application to organic structural analysis.

In the final analysis, this is a book which can be broadly recommended, especially for the excellent section of nmr spectroscopy and the sound, balanced approach to infrared spectroscopy.

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The Amino Sugars. The Chemistry and Biology of Compounds Containing Amino Sugars. Volume IIA. Distribution and Biological Role. Edited by ENDRE A. BALAZS, Institute of Biological and Medical Sciences-Retina Foundation and Harvard Medical School, Boston, Massachusetts, and ROGER W. JEANLOZ, Harvard Medical School and Massachusetts General Hospital, Boston, Massachusetts. Academic Press Inc., 111 Fifth Ave., New York, N. Y. 1965. xxvi + 591 pp. 16 × 23.5 cm. \$22.00.

Volume IIA of this projected series of a four-volume treatise comprises a survey of the distribution and biological role of the amino sugars and amino sugar containing molecules in a wide variety of living forms. It is divided into 20 chapters which cover the presence of these compounds in the living forms described. This book commences with Chapter 18 in this volume and includes contributions from 19 different authors, all of whom are specialists of the tissues and organs which are discussed. Most of the discussions are concentrated on mammalian forms. There is one chapter on the distribution in microorganisms, viruses, and invertebrates, by Nathan Sharon, which is an extremely good review of these forms. Especially is this so for the discussion of the bacterial capsular compounds. The value of this long chapter of 45 pages lies in its encyclopedic coverage of a wide range of bacterial forms and their varied amino sugar components. The presence of amino sugars in algae and lower forms of plant life is discussed, and the surprising conclusion is shown that these compounds are rare, or indeed only rarely found, in higher plants. The author refers to the difficulties of conclusive determination of small amounts of these compounds in the presence of other compounds such as sugars, amino acids, and other substances. He mentions the value which may be obtained in such studies with the use of ion-exchange resins. In the invertebrate animals the amino sugars are present as a form termed chitin, the composition of which is discussed at length by this author.

The book then quickly switches to mammalian systems with a discussion of the amino sugars and related compounds in liver tissue, in a chapter by R. G. Spiro. This is a well-written chapter including varied aspects of the metabolism of hexosamine and the sialic acids. Rather extensive coverage is made of the pathology of liver in aspects of abnormal carbohydrate metabolism related directly to the amino sugars and their associated molecular complexes.

A following chapter by the same author on kidney tissue follows the same pattern as the above with a discussion on the hexosamines and sialic acids and the results of pathology of this tissue to the metabolism of these compounds.

The following chapters of the volume switch to varied aspects of mammalian biochemistry. Chapter 22 by Z. Dische is a good survey of the mucous membranes and cellular excretion products of the living epithelium. A following short chapter by I. Werner and L. Odin on the glycoproteins of the salivary glands, saliva, and sputum completes this coverage of the cellular excretion forms of the amino sugars and derivatives.

The volume serves a valuable function in providing a large amount of information. However, like any collection of diversified mate-

rial written by different authors there is found to be a wide variety in the technique of reviewing the subject at hand. Some of the authors have obviously followed the usual *Annual Reviews* format and have given a list of work with no pertinent discussion. Typical of this is a statement such as "the rate of incorporation of X *in vivo* has been studied by Smith and Jones (1960)." This does not tell about the results obtained and leaves a legitimate question in the mind of the reader. This is often unfortunate because the book is intended both for the expert and the novice who are at the opposite poles in their knowledge of the pertinent literature. The authors are to be complemented, however, despite a few lapses into this style, by presenting an excellent view of the over-all field. In many cases it has been a difficult task because several of the surveys are new with no previous reviews to build on.

The editors are to be complemented in selecting, in general, competent authors. The organization of the chapters seems as if it could have been better arranged. A chapter by Lers Sundblad on "Glycosaminoglycons and Glycoproteins in Synovial Fluid" would seem to be more closely related to the earlier chapter by Z. Dische on "Mucuses and Mucous Membranes." This is a minor point and the chapters on special tissues such as blood cells, nervous tissues, eye and ear tissues have no obvious special order in a volume such as this.

The Bibliography and Author Index are very complete, and together with the Index they provide a valuable guide to the reader. The addenda in many chapters updates the information to 1964 so that, with the time of publication usually involved in a volume such as this, it is as up-to-date as it is possible to make it. It is to be hoped that an early revision of this volume will be planned to keep it abreast of the rapid expansion of knowledge in this field.

The volume is of great value for biochemists and carbohydrate chemists, and should fill a real need in providing a compendium of information in the field of the amino sugars and their related compounds.

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Theory and Principles of Electrode Processes. By B. E. CONWAY, University of Ottawa. The Ronald Press Co., 15 East 26th St., New York, N. Y. 1965. vii + 303 pp. 16 × 23.5 cm. \$7.00.

The author clearly and succinctly states the purpose and limitation of the book in the preface and introductory chapter. These are electrochemical kinetics of activation-controlled processes with especial attention to his and co-workers' contributions. Since Conway is one of the leaders of electrode kinetic research, these contributions are both considerable and important.

Most of the book is concerned with the structure of the metal-solution interface and its influence on electrode processes. The discussion is advanced and presupposes an understanding of chemical kinetics and basic electrochemistry. Conway gives an excellent, but brief, review of the theory of the double layer with especial attention being paid to the effects of dielectric saturation at the interface. Ionic and molecular adsorption is similarly treated. Here the application of the Temkin isotherm is stressed, and Conway shows how the use of this isotherm can conform kinetic theory with experimental fact for cases where the Langmuir isotherm fails.

The last two chapters briefly deal with selected problems. Kinetic theory is applied to the following important electrochemical systems: the hydrogen and oxygen reactions, corrosion and passivity, metal deposition and dissolution, ionic oxidation-reduction reactions, rapid electrochemical reactions, organic electrode processes, anodic films, stoichiometric numbers, and, in the last chapter, electrochemical field effects at the gas-metal interface. This chapter does not fit in with the rest of the book, but it is so short that it really doesn't matter. There is one short appendix listing "Basic Types of Mechanisms for Organic Electrode Processes" and 319 references.

Conway has written an excellent monograph that will be of value to many investigators and advanced students of electrochemistry. The printing, illustrations, and technical details of the book are excellent—and the price is right.

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