

devoted to the fundamental problem of enzymology: the nature and function of active sites. Compressed within nineteen pages are not only useful evaluations of published work but also the author's original views on approaches to the problem.

The text is unusually free from errors and is carefully indexed. References are numerous and up to the minute. One can criticize the excessive use of inverted commas, which can give the text a disjointed appearance. This book will be useful to all who delve into the mysteries of enzyme action.

E. F. HARTREE

ACTIVITY IN ANALYSIS

Analytical Chemistry

Vol. 2. Edited by Carl E. Crcuthamel. (Progress in Nuclear Energy, Series 9.) Pp. vii + 400. (London and New York: Pergamon Press, 1961.) 100s. net: 15 dollars.

THE first volume of this series consisted of a collection of papers from among those presented at the second International Conference on the Peaceful Uses of Atomic Energy held in 1958. The papers in this second volume have not previously appeared though references to the 1958 Conference proceedings occur frequently in several of the sections. The eight topics dealt with here, each by an authority in his field, are those considered likely to have a marked influence on the future of analytical methods associated with nuclear energy.

The first chapter on "Recent Advances in Counting Techniques" opens with an excellent account of gas ionization proportional counters and their use in non-dispersive X-ray analysis. The theory and construction of these counters are dealt with in detail. This is followed by sections on p - n junction and surface barrier counters, and on scintillation spectrometry.

The second chapter, on the "Applications of Electron Spin Resonance Spectroscopy", gives a full account of the theory of electron spin and of the many types of interaction affecting the energy-levels of the 'spinning' electron. This is followed by a description of many applications, including investigations on transition elements, donor concentrations in semi-conductors, organic free radicals and radiation-induced free radicals. Some notes on microwave and radiofrequency electron spin resonance equipment conclude this section, but the experimental approach is not covered as completely as the theoretical.

The next chapter, on "Recent Advances in the Separation and Analysis of the Transuranium Elements", covers the analytical chemistry of ten elements and closes with a footnote on the discovery of element 103. This is followed by one on "Applications of Liquid-Liquid Extraction in Inorganic Separations". The general concepts of the process are lucidly described and there is a good account of positive and negative synergistic effects. Many examples of fundamental research on separations of potential use in analysis are given.

A review on "Flame Photometry and Atomic Absorption Spectroscopy" describes the principles of the methods and in the case of flame photometry emphasis is placed on high-temperature oxyecyanogen flame photometry and on Dean's technique of using as carrier an organic solvent which has previously extracted and concentrated the elements of interest. The limits of detection of a large number of metals, under different experimental conditions, are given in tabular form.

A chapter on "Recent Advances in Ultra-violet, Visible and Infra-red Spectrometry" covers the period of the past decade. The determination of a number of metals including technetium, of interest as a corrosion inhibitor, is described followed by practical details of the pressed pellet technique in infra-red analysis and of absorption spectrometry in molten salts.

The penultimate chapter considers two aspects of the interaction of beta particles with matter. The first deals with backscattering and describes the effect of atomic number of the backscatterer, and the energy degradation and angular distribution of the backscattered beta particles. The second details the excitation of characteristic X-rays by beta particles and the design and uses of X-ray sources based on this phenomenon.

The volume ends with a general account of ion exchange chromatography, including the use of hydrous oxide and heteropolyacid salt inorganic exchangers and cellulosic exchangers. Organic applications are included.

A good feature of this volume is the comprehensive bibliography at the end of each chapter. The editor's aim of including the basic principles of new techniques in addition to covering recent advances is amply fulfilled in this book. The subject index is scanty, and it might have been better to omit the lengthy author index, which includes all the names in the references, and devote more space to the former.

D. I. COOMBER

ADVANCES IN INORGANIC CHEMISTRY

Advances in Inorganic Chemistry and Radiochemistry Vol. 4. Edited by Prof. H. J. Emeléus and Dr. A. G. Sharpe. Pp. viii + 344. (New York: Academic Press, Inc.; London: Academic Press, Inc. (London), Ltd., 1962. 88s.

THE previous volumes in this series have each strongly emphasized the chemistry of a particular group of elements, but in the present volume it is the subject of organometallic compounds which recurs throughout the book. They are the subject of the very complete and up-to-date review on "Olefin, Acetylene, and π -Allylic Complexes of Transition Elements", by R. G. Guy and B. L. Shaw, and figure extensively in the review on the stereochemistry of nickel, palladium and platinum by J. R. Miller, and in "The Use of Nuclear Magnetic Resonance in Inorganic Chemistry", by E. L. Muettorties and W. D. Phillips. There is a certain amount of overlap, particularly between the first two of these chapters, but this is not serious as Miller emphasizes the actual stereochemical structures adopted by the compounds of these elements while Guy and Shaw pay major attention to the compounds themselves. The article on nuclear magnetic resonance, a technique which has played a fundamental part in the elucidation of the structures of organometallic compounds, only deals with the spectra of these compounds as particular examples but also deals very fully with most of those aspects of nuclear magnetic resonance spectroscopy which would be of interest to a physicist or physical chemist interested in the spectra of inorganic compounds.

K. W. Bagnall writes on "The Chemistry of Polonium". Extensive reviews were written on this little-known element as recently as 1957, but in spite of this its reactions are being so actively investigated that a new review is amply justified. On the other hand, I was rather disappointed in "Condensed Phosphates and Arsenates", by E. Thilo, as there is no great extension to the discussion given by Van Wazer in his book of 1958 while the treatment is rather classical with only brief reference to some of the modern physical methods which have been used in the study of these compounds. Finally, J. D. MacKenzie reviews "Oxide Melts". The examination of melts is rapidly becoming of major importance as they provide opportunities for carrying out reactions in a non-aqueous medium at an elevated temperature. Oxide melts are little understood at the moment but this review summarizes the known properties of those systems. There are no articles on radiochemistry in the present volume.

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