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BOOK REVIEWS

Bibliography of **Ozone Technology. Volume 1. Analytical Procedures and Patent Index.** By CLARK E. THORP, Manager, Department of Chemistry and Chemical Engineering, Armour Research Foundation of Illinois Institute of Technology, Technology Center, Chicago 16, Illinois. Armour Research Foundation, 10 West 35th Street, Chicago 16, Illinois. 1954. 209 pp. 14.5 × 22.5 cm. Price, $5.25.

This book is the first of a proposed series dealing with the chemistry of ozone. The stated object of the author is to make available to others the large bibliography in the rapidly expanding field of ozone chemistry which he and his associates have accumulated. The first part of the volume lists two hundred and sixty-six references dealing with analytical methods for gaseous ozone. Following most of these is a brief statement indicating the sort of information to be found in the reference. Factual information is sometimes given but generally no systematic attempt has been made to abstract the articles. Likewise no critical evaluations are included. The list goes back over one hundred years and the author has striven to include some reference to all published methods of ozone analysis regardless of its vintage.

Part two lists, without comment, nine hundred and eighty patents related to ozone. These are separated into fifty-two groups, such as Air Conditioning, Generators, Ozone-resistant Materials, and the like. The author believes that the list up to 1954 is at least 90% complete but warns the reader that other pertinent patents may exist under obscure classifications. The volume index is categorized according to Author, Subject, Patentee and Patent Number. This publication should prove to be highly useful to everyone who is concerned with research involving ozone.

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Glutathione. Proceedings of the Symposium Held at Ridgefield, Connecticut, November, 1953. By S. COLOWICK, A. LAZAROW, E. RACKER, D. R. SCHWARZ, E. STADTMAN and H. WAELSCH (Editors). Academic Press, Inc., Publishers, 125 East 23rd Street, New York 10, N. Y. 1954. x + 341 pp. 16 × 23.5 cm. Price, $7.50.

This book is a collection of 29 papers which were presented at the symposium. As a very worthwhile feature, the book also includes transcripts of discussions of the papers at the symposium. All angles of the subject of Glutathione are covered: Properties and Organic Chemistry, The Methods for Detection and Assay of Glutathione and Sulfhydryl Compounds, Biochemical Mechanisms, and Physiological Action and Clinical Aspects. Approximately 1000 literature citations are included. With nearly 60 contributors, the quality and clarity of presentation of the material is not uniform, but the over-all impression is one of excellence.

The editors and publishers are to be commended for the inclusion of excellent indices and for the fine workmanship which went into preparation of the book. Few typographical errors were noted, and with the exception of two transposed figures (p. 63 and 68) the errors cause no confusion.

This book will be invaluable for anyone interested in glutathione, whether he is actively working in the field or merely needs a bit of information for use in some other field.

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Einführung in die Ultrarotspektroskopie. By WERNER BRÜGEL, Physiker in der Badischen Anilin- and Soda-Fabrik AG., Ludwigshafen a. Rh. Dietrich Steinkopff Verlag, 16, Darmstadt, Holzhof-Allee 35, Germany. 1954. xii + 366 pp. 15.5 × 22 cm. Price, Brosch, DM 46.-, Geb. DM, 49.-.

Before 1940 infrared spectroscopy was a specialty practiced by a few devotees on instruments designed and constructed in their own laboratories. It has since expanded so enormously that there are probably in the neighborhood of 2000 infrared spectrometers in use today, and it has become an important adjunct to research in all branches of chemistry as well as a useful analytical tool for both the laboratory and the factory. Nevertheless, since the excellent early work by Schaeffer and Matossi, no adequate introduction to the theory and practice of the field which takes into account the newer developments has been published. Dr. Brügel has attempted to fill the need for such an introduction, primarily directed to the "practical" spectroscopist, and whereas this reviewer does not always agree with the author as regards the selection and balance of material his work is, by and large, successful.

The first quarter of the book is devoted to the theory of rotational spectra, rotation-vibration spectra, molecular vibrations and their symmetry properties. As the author acknowledges, this section follows Professor Herzberg's book very closely and has little relation to the remainder of this volume. A discussion of molecular vibrations in terms which might be applicable to the consideration of the spectra of larger molecules is not given at all while much space is devoted to the consideration of fine structure in gas spectra.

The next fifty pages cover light sources, prism monochromator design and calibration, infrared detectors, and general considerations regarding various types of infrared spectrometers and their use. It is curious that the diffraction grating is dismissed in a paragraph as important only for fine structure studies and not for "practical" spectroscopy. In a later section the author stresses the need for the development of techniques to make possible a quantitative "intensity" spectroscopy to parallel the well developed "frequency" spectroscopy; since one obstacle to achieving this goal is inadequate resolution it seems likely that the grating instrument will take its place in the analytical laboratory before long.

Another thirty-five pages are devoted to a description of most of the commercial instruments and accessories produced in Germany, Britain and America. This is followed

by a chapter on the preparation of gas, liquid and solid samples which satisfactorily includes most of the techniques which have been employed up to the present. The last one hundred and thirty pages are spent on practical infrared spectroscopy (*i.e.*, the elucidation of the structure of molecules from group frequencies, qualitative and quantitative analysis) and the results and applications of low resolution infrared spectroscopy. This is probably the most valuable part of the book.

The 595 references extend to 1953 and it is probable that any important class of results or development in technique through this date has at least been mentioned. The author has made no attempt at complete coverage of the literature, which is quite appropriate in an introductory work, but at times the references cited seem haphazard and spotty. Certainly they have not all been viewed critically. For example, on p. 92 it is stated that rotational fine structure has been observed in the ammonium halides, although several subsequent investigations have shown the observations cited to be erroneous. Similarly, two of the three fundamental frequencies given for H_2S on p. 292 are now known to be in error, one of them by more than 100 cm.$^{-1}$. Nevertheless, for anyone entering the field or beginning to use infrared spectroscopy as a tool this book should be a helpful guide to the voluminous literature.

In sum, although the book gives the impression of being a compendium of material collected from a variety of sources rather than an integrated work it will be a useful introduction to its field.

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From Classical to Modern Chemistry. Some Historical Sketches. By A. J. BERRY, M.A., Fellow Emeritus of Downing College, Cambridge. Cambridge University Press, 32 East 57th Street, New York 22, N. Y. 1954. xi + 251 pp. 14 × 22 cm. Price, $4.75.

In this book, Dr. Berry discusses the historical development of a number of fields in chemistry, continuing a work begun in a previous volume, *Modern Chemistry*. After an introductory chapter which is called "Some Remarks on Theory in Chemistry" and which gives a general view of this subject, the author turns his attention to certain specific fields of interest. The following chapter-headings will give a good idea of the matters treated by the author: "Vicissitudes of the Theory of Heat," "Some Aspects of Classical Electricity and Electrolysis," "Physical Optics and Chemistry," "Molecular Magnitudes," "Analytical Chemistry," "Chemical Formulae," "Some Problems Relating to Valency, Radicals and Constitution" and finally "Some Considerations on Kinetic Chemistry." Each topic is treated from an appropriate beginning in time up to the present, although greater emphasis is in general placed on the older history of the development.

We have in these historical sketches a very competent portrayal of topics that are of high interest to chemists. The book might well be recommended reading for graduate students, some of whom seem inclined to think that anything done or published ten years ago is already out of date and valueless. Teachers of chemistry will find this volume very useful in keeping their knowledge of the history of their science fresh and active.

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April 10, 1955—May 10, 1955

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