

**Oxine and its Derivatives. Volume I. Oxine, Part 1.**

By R. G. W. HOLLINGSHEAD, M. A. (Oxon). Butterworths Scientific Publications, 88 Kingsway, London W.C. 2, England. 1954. x + 332 pp. 16 × 25.5 cm. Price, \$8.80. Volume II. Oxine, Part 2. v + 313 pp. 16 × 25.5 cm. Price, \$8.80.

This work must certainly be the first four-volume monograph ever published about a single organic analytical reagent. The first two volumes give an exhaustive collection of the literature concerning the preparation, properties and reactions with metals of 8-quinolinol (oxine), while the last two (not reviewed here) give similar treatment to the derivatives. Although the author succeeds in collecting virtually all the published information about the analytical uses of oxine, very little critical appraisal of this literature is attempted.

After four chapters about the preparation, properties and general uses of oxine there follow 29 chapters devoted to the determination of 29 elements or groups of elements. The last chapter briefly cites non-analytical applications of oxine. The first four appendices in Volume II summarize drying temperatures, pH of precipitation and extraction, and wave lengths of maximum absorption for the metal oxinates. The fifth appendix is a bibliography of papers published after the manuscript went to press. There is a subject index.

The author cites 139 references in the chapter on magnesium and 157 on aluminum. The natural suspicion that as many original variations on two simple reactions are hardly possible is confirmed by the numerous contradictions of one worker by another as recorded in these two volumes. Indeed the most striking impression left by the monograph is the poor agreement of different workers about facts capable of unequivocal determination.

For anyone interested in 8-quinolinol this monograph is the definitive work, inasmuch as it seems inconceivable to this reviewer that any other publisher will ever dare the financial risk of this venture. The binding and other mechanical details of these volumes are very good.

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**Heterocyclic Compounds. Volume 6. Six-Membered Heterocycles Containing Two Hetero Atoms and Their Benzo Derivatives.** Edited by ROBERT C. ELDERFIELD, University of Michigan. John Wiley and Sons, Inc., 440 Fourth Avenue, New York 16, N. Y. 1957. vii + 753 pp. 15.5 × 23.5 cm. Price, \$25.00.

The sixth volume in Dr. Elderfield's compendium on heterocyclic compounds continues the effort to be comprehensive without being either telegraphic or exhaustive to the point of tedium. It is therefore an invaluable reference, yet is sufficiently generalized to be a book for study. Major English and German literature is covered through 1955 or in some instances 1956, the more obscure sources through about 1952. Reactions and methods of synthesis account for the bulk of the discussion; theory is not stressed.

Subject matter includes the dioxenes, dithienes, diazines, oxathienes, oxazines and thiazines, and their hydrogenated, substituted, benzo and polybenzo derivatives. Monocyclic dioxanes and dioxenes are discussed by Chester B. Kremer and Leo K. Rothen; benzodioxanes, oxathianes, dithianes and their unsaturated and benzo derivatives by Robert C. Elderfield; pyridazines and cinnolines by Thomas L. Jacobs; phthalazines by Robert C. Elderfield and Stephen L. Wythe; pyrimidines by G. W. Kenner and Sir Alexander Todd; quinazolines by Thurmond A. Williamson; pyrazines, piperazines and quinoxalines by Yolanda T. Pratt; monocyclic oxazines by Norman H. Cromwell; benzoxazines by Robert C. Elderfield, William H. Todd and Samuel Gerber; thiazines and benzothiazines by Robert C. Elderfield and E. E. Harris; phenazines, phenoxazines and phenothiazines by D. E. Pearson.

The writing is generally lucid. The authors have attempted, at least within each chapter, to make numbering and nomenclature consistent and rational. The task is beyond them. A particularly fine example of a misleading trivial name may be found on page 683. Oxychlororaphin contains no more oxygen than chlororaphin, which contains

no chlorine at all. Oxychlororaphin is, to be sure, obtained by oxidative loss of hydrogen from chlororaphin, which is green. Anyway, virtually every page of the entire book has several complete structural formulas, making comprehension possible. Text and formulas alike are remarkably free of errors.

The ratio of index to text pages is 3.6%, which is probably higher than average. Each chapter is headed by a useful table of contents. Even so a test, conducted by choosing several topics from the text and attempting to find them again with the help of the index and the tables of contents, was not notably successful. The seeker for such topics is going to have to do a good deal of browsing which may be good for his fund of knowledge but bad for his temper.

The price per page of the volumes in this series, after holding steady for volumes 2 through 5, has again risen. A page of volume 6 costs more than twice as much as a page of volume 1. Since this increase closely parallels that of the cost of living, we cannot complain. The conviction persists that a book costing twenty-five dollars should have a lot in it. It does.

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EDWARD M. CRANE

**Tables of Light Scattering Functions for Spherical Particles**

WILLIAM J. PANGONIS, Film Department, E. I. du Pont de Nemours and Company, WILFRIED HELLER, Professor of Chemistry, Wayne State University, and ARVID JACOBSON, Professor of Mathematics, and Director of Computation Laboratory, Wayne State University. Wayne State University Press, Detroit 2, Michigan. 1957. v + 116 pp. 15.5 × 23 cm. Price, \$5.50.

This book contains light scattering functions calculated for size and refractive index values pertinent to liquid dispersions of colorless colloidal spheres (e.g., rubber latices). The functions tabulated are the total scattering cross-sections, as well as certain coefficients from which the scattering can be found as a function of angle by easy summations with the help of previously published angular functions. Tables are given for ratios of the refractive indices of the spheres and the suspending medium of 1.05, 1.10, 1.15, 1.20, 1.25 and 1.30, and for values of the parameter  $\alpha$  from 0.2 to 15 plus a few other scattered values ( $\alpha$  is equal to  $\pi$  times the ratio of diameter to wave length). The values selected seem to be spaced closely enough to allow reasonably accurate interpolation.

According to the introduction, the tables have been carefully checked by at least two independent computations. The arrangement is clear and the type is easy to read.

Extensive tables of this kind have been published previously, but only for higher values of the refractive index ratio, which are more appropriate for aerosols.

GENERAL ELECTRIC RESEARCH LABORATORY

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**Light Scattering by Small Particles. Structure of Matter Series.**

By H. C. VAN DE HULST, Leiden Observatory. MARIA GOEPPERT MAYER, Advisory Editor. John Wiley and Sons, Inc., 440 Fourth Avenue, New York 16, N. Y. 1957. xii + 470 pp. 23.5 × 16 cm. Price, \$12.00.

Light scattering was a subject of interest to only a few specialists until about fifteen years ago. (We are distinguishing light scattering without change of wave length, or "Rayleigh scattering," from the related Raman effect.) Now, however, the use of light scattering for determining molecular weights and shapes in macromolecular chemistry, and the increased interest in atmospheric and interstellar particles in meteorology and astronomy, has made it important to thousands of scientists.

A result of this change of emphasis has been the need for monographs reviewing and introducing the subject for chemists and others to whom the subject is important but who lack the experience in theoretical physics necessary for the easy understanding of much of the original literature. Such monographs have been slow in forthcoming; one of the difficulties is that the general theory of light scattering involves several fields that do not usually overlap, physical optics and statistical mechanics in particular. Very few prospective authors can develop the degree of expertise in both