

folic acid series is discussed separately and includes a résumé of the physiological actions of the substances, as well as of possible biosynthetic routes.

In keeping with the tradition of this series, excellent bibliography, author and subject indexes are supplied, and the physical appearance of the volume is of a high caliber. Chemists and biologists alike will welcome the volume as an addition to their libraries.

RESEARCH DEPARTMENT
CIBA PHARMACEUTICAL PRODUCTS, INC. HANS HEYMANN
SUMMIT, NEW JERSEY

Heterocyclic Compounds with Indole and Carbazole Systems. The Chemistry of Heterocyclic Compounds. Volume VIII. ARNOLD WEISSBERGER, Consulting Editor. By WARD C. SUMPTER, Western Kentucky State College, Bowling Green, Ky., and F. M. MILLER, University of Maryland, Baltimore, Md. Interscience Publishers, Inc., 250 Fifth Avenue, New York 1, N. Y. 1954. xii + 307 pp. 16 × 23.5 cm. Price, \$10.00 single copy, \$9.00 subscription price.

This book, dealing with indole and carbazole systems, contains a review of the methods of synthesis of the simpler compounds such as indole, carbazole, isatin, oxindole, isatogen and indoxyl, and an account of the properties and reactions of these compounds and their more complex derivatives. A résumé of the highly complex naturally-occurring indole derivatives also is included. The material is systematically presented and the reader obtains a good idea of the methods of preparation and the reactions of the indolic type of compounds although, as the authors mention, they have not attempted to duplicate Beilstein in listing every compound. The chapter on indigo, for instance, does not delve at length into the details, yet it supplies an overall picture of the problem at hand and the way it was solved.

It is stated in the preface that the literature up to the end of 1952 has been consulted and that several important papers of 1953 have been included. Some omissions such as the structure of corynantheine, based on work published in 1950-1952, and the latest structure of alstonine, published in 1952, lead one to the conclusion, however, that the literature survey for 1950-1952 at least has not been too thorough. Furthermore, under the heading tryptophan, one would have expected to find some mention of kynurenine, and the biochemical relationship of these two substances. It is also regrettable that the book is marred by numerous typographical errors that careful proof-reading would have avoided.

Not to end on a discordant note, however, the book should be very helpful to the chemist in supplying him with a bird's-eye view of a most complex field of organic chemistry and biochemistry in which research in recent years has been most active.

DIVISION OF PURE CHEMISTRY
NATIONAL RESEARCH COUNCIL
OTTAWA, CANADA

LEO MARION

Grignard Reactions of Nonmetallic Substances. By M. S. KHARASCH, Professor of Chemistry, The University of Chicago, and Otto Reinmuth, Research Associate, The University of Chicago. Prentice-Hall, Inc., Publishers, 70 Fifth Avenue, New York 11, N. Y. 1954. xxii + 1384 pp. 15 × 23 cm. Price, \$15.00.

Someone once remarked that if a speaker at a gathering would ask "Is there an economist in the house?" positive replies would come not only from the few followers of Adam Smith who might be present but also from bankers, merchants, brokers and industrialists. Similarly, a question put to a group of chemists "Is there someone here who knows about Grignard reactions?" might elicit almost universal response, for who among us has not carried out a Grignard reaction? If pinned down, however, few of us would care to be quizzed on the large area covered by Kharasch and Reinmuth. The fact that no modern comprehensive treatise is available on a subject as common as this is testimony to the tremendous literature on the subject. The authors would have performed a valuable service if they had prepared nothing but a bibliography, but the

critical expository treatment combined with the judicious care in presentation make this a reference work of unusual importance.

The size of the book may discourage some persons from attempting to delve into its contents, but actually of the 1384 pages less than 450 pages represent text since there are over 900 pages of tables and 37 pages of index. The reviewer found the index useful for broad categories but not so helpful in locating specific compounds. So much of the information is tabular, however, that this would be expected.

A detailed chapter on preparation of Grignard reagents is followed by one on their constitution and dissociation, then one on some radical reactions of Grignard reagents, followed by eighteen chapters covering reactions with compounds containing the various functional groups. Much of this presentation, of course, is factual copy of published work, but the authors have been motivated throughout to explain the observations in terms of modern theory and to evaluate conflicting data in the light of their own experience.

A few of the topics dealing with Grignard reactions which are given this type of critical appraisal include the radical reactions, Grignard reagent enolate formation, α -halo ketone dehalogenation, the concept of a quasi 6-membered ring transition state in many Grignard reactions, constitutional factors affecting order of addition, mechanisms of carboxylic ester reactions, hindered alkyl esters, speculations on the reaction mechanisms with acyl halides and acid anhydrides, effective migratory aptitudes in epoxide ring opening, and reaction mechanisms with alkyl halides.

Although this book will be invaluable as a work of reference, it seems reasonable to predict that chemists, intending to use it only for reference purposes, will find themselves staying to read it long after the reference is located. It is that kind of book.

NORTHWESTERN UNIVERSITY
EVANSTON, ILLINOIS

CHARLES D. HURD

Solvents and Allied Substances Manual with Solubility Chart. Compiled and edited by C. MARSDEN, B.Sc., A.R.I.C., British Industrial Solvents, A Division of The Distillers Company Limited. Elsevier Press, 402 Lovett Boulevard, Houston, Texas. 1954. xii + 429 pp. 16.5 × 25 cm. Price, \$12.95.

The author states in the preface that he "has necessarily accumulated a mass of information on solvents and allied chemicals currently in commercial production. . . . A careful and critical study of this conflicting data has been made and the outcome is offered in this volume. That all the information contained in it should be completely accurate is too much to hope but the more serious discrepancies and variations in published information and figures have been eliminated by careful selection in an effort to ensure that the data here presented are as accurate as possible in terms of present knowledge."

In a typical example of one of the more common solvents, such as acetone, where naturally fairly complete information was available, the following data are given. Under physical characteristics and properties are listed: mol. wt., b.p., m.p., flash point (closed and open cup), auto-ignition temperature, specific gravity, refractive index at 20 and at 25°, caloric value, specific heat at 20°, coefficient of cubic expansion at 20° and the mean from 0-100°, electrical conductivity at 20°, dielectric constant at 20°, explosive mixtures with air at 20° (upper and lower limits), latent heat of evaporation, latent heat of fusion, evaporation rate (for ether = 1 and for *n*-butyl acetate = 100), dilution ratios for cellulose nitrate solutions for water, toluene, xylene, petroleum naphtha and butanol, viscosity, surface tension at 20° and at 30°, vapor pressure, solubility in water, critical temperature, critical pressure and critical density. Other information given relates to methods of manufacture, industrial grades, azeotropes, physiological properties, and storage and handling. The main manufacturers both in the United States and in Britain are given for each solvent.

In other instances, particularly for very special proprietary solvents, comparatively very few data are given. For example, under "Intrasolvan E," a product whose manufacture is confined to Britain, only four physical characteristics are listed together with storage and handling.