

BOOK REVIEWS

The Organic Constituents of Higher Plants, Their Chemistry and Interrelationships. By TREVOR ROBINSON, Chemistry Department University of Massachusetts, Amherst, Massachusetts, with contributions by ERNEST SONDHEIMER, Department of Forest Chemistry, New York State College of Forestry, Syracuse, N. Y. Burgess Publishing Company, 426 South Sixth Street, Minneapolis 15, Minnesota. 1963. 22.5 × 28.5 cm. 306 pp. Price, \$6.75.

This is an attractively packaged survey of the different types of compounds which chemists have isolated from plants. Topics treated are carbohydrates, water-soluble organic acids, aromatic compounds (including lignans), saponifiable lipids, unsaponifiable lipids (a hodgepodge including *inter alia* acetylenic alcohols and ketones, phloroglucinol derivatives, chromones, and quinones), terpenoids and steroids, flavonoids, amino acids and proteins, nucleic acids and derivatives, alkaloids (discussed cavalierly in a very short chapter), porphyrins, and a group of miscellaneous nitrogen and sulfur compounds.

This book is directed at biologists and others who may need to acquaint themselves superficially with one or several topics in natural products chemistry before going on to review articles or monographs to which references are given. It cannot be recommended to chemists who will find that it is barely written at the level of students who are in the midst of a rigorous course in undergraduate organic chemistry and have been exposed to some biochemistry.

Even at this level, however, the complete lack of reference to stereochemistry in the formulas or in the text is somewhat distressing. A praiseworthy feature is the presentation of elementary biogenetic schemes, generally in chart form, for most classes of compounds discussed.

DEPARTMENT OF CHEMISTRY
THE FLORIDA STATE UNIVERSITY
TALLAHASSEE, FLORIDA

WERNER HERZ

Dünnschicht-Chromatographie. By KURT RANDEATH. Verlag Chemie, G.m.b.H., Weinheim/Bergstr., Postfach 149, Germany. 1962. xii + 243 pp. 17.5 × 24.5 cm. Price, DM 22.

Dünnschicht-Chromatographie. Ein Laboratoriumshandbuch. Edited by E. STAHL, mit 197 Abbildungen und 2 Farbtafeln. Springer-Verlag, Heidelberger Platz 3, Germany, Berlin-Wilmersdorf. 1963. xv + 534 pp. 17 × 23.5 cm. Price, DM 56.

The use of thin layer chromatography (t.l.c.) as a new rapid and invaluable analytical and preparative separation method has shown a remarkable growth since E. Stahl in 1958 standardized and developed the method which had been introduced among others by N. A. Ismailov, M. S. Schraiber, and E. Kirchner. Although thin layer chromatography was first applied mainly to lipophilic substances, its use was later extended to hydrophilic compounds like amino acids and inorganic ions. The use of polyamide and cellulose ion exchange powder for the preparation of the layers and the use of partition systems with paraffin-impregnated plates further broadened the field of application. It has now become general practice in most modern laboratories to check every crude reaction mixture as well as purified product by thin layer chromatography, especially in all cases where the use of gas chromatography is not feasible. The whole field has now been reviewed authoritatively by authors who have taken a decisive part in the development of the field.

The shorter book by K. Randerath gives a concise treatment of the theories and general techniques of thin layer chromatography, including thin layer electrophoresis, ion-exchange thin layer chromatography, and partitions. The scope of applications ranges from the separation of alkaloids, antibiotics to the separation of nucleic acids and inorganic ions, supplying all the essential information and references. Only a few mistakes could be found; e.g., table 6 (page 16), which describes an elutrop series of solvents and solvent mixtures, contains errors and should be used with caution. The book is very well written with clear figures and charts and tables and will especially be useful for

chemistry students and bench chemists who do not need a very detailed description of elementary theories and experimental details.

The more detailed book edited by E. Stahl is written by a number of specialists and gives very detailed information about all the different aspects of thin layer chromatography. In the general part, the equipment and techniques are discussed thoroughly by E. Stahl and H. Ganshirt; this is followed by a fundamental treatment of the theories by M. Brenner. The various applications in the special part are discussed with a wealth of details and frequently contain information which is not connected directly with thin layer chromatography; e.g., in the otherwise excellent chapter on lipids by H. K. Mangold, a whole section is devoted to structural formulas and methods of isolation and extraction of lipids.

On the whole, the book is very well written and contains many figures, charts, and tables, among these a very useful compilation of spray reagents. This more detailed book is especially useful for scientists in the biological fields, medical doctors, and chemists, who prefer a very detailed introduction in elementary theories, techniques, and applications of thin layer chromatography.

As a final word of criticism the reviewer feels that both books give the impression that all the more or less elaborate equipment described is necessary. Yet many things can in fact be simplified if a high reproducibility of R_f -values is not required, e.g., the activated plates can conveniently be stored in a drawer for quite a while without protection against humidity. Furthermore, the plates can be developed in any container, the small plates for example in the brown powder bottles, in which the silica gel G is commercially available, so that the method can be used conveniently by any chemist in any laboratory.

But these are only minor objections and do not diminish the value of the books, which will be very useful for everybody who uses thin layer chromatography. English translations of both books are in print and will be published shortly.

WOODWARD RESEARCH INSTITUTE
BASEL 7, SWITZERLAND

HELMUT VORBRÜGGEN

Methoden der Organischen Chemie (Houben-Weyl). Vierte, Vollig Neu Gestaltete Auflage. Band XIV. Makromolekulare Stoffe. Teil 2. Edited by EUGEN MÜLLER with O. BAYER, H. MEERWEIN, and K. ZIEGLER. Georg Thieme Verlag, Herdweg 63, Stuttgart, Germany. 1963. lxxii + 1251 pp. 18 × 26 cm. Price, DM. 272; Vorbestellpreis CM. 244.80.

The highly favorable comments which have been written concerning Part I of Volume XIV of this series (*J. Am. Chem. Soc.*, **84**, 4997 (1962)) apply equally well to Part II. Part I was devoted to vinyl and divinyl polymers, and in Part II the compendium continues in these major sections: A. Methods of preparation of condensation and "addition" polymers. B. Methods of modifying the structure of natural and synthetic polymers. C. Methods of ascertaining macromolecular structure.

Under Part A are included polyesters, -carbonates, -urethanes, -amides, and the more complex usually cross-linked polymers such as phenol-formaldehyde, urea-formaldehyde, and the many related polymers of this family. In addition this section covers polyaldehydes and ketones as well as polymerization by the ring opening of cyclic monomers.

Again the coverage of the patent literature seems to be extremely good although perhaps weighted on the side of German patents. It is particularly useful to find specific laboratory instructions for the preparation of a number of highly unusual polymers as well as a word or two about their properties.

Houben-Weyl being a treatise on organic chemistry, the editors have omitted coverage of the large number of inorganic polymers. Many chemists will regret the omission of some polymers which are partially organic such as the silicones. In view of the benefits to be derived from these volumes the last must rate as a very minor complaint.

DEPARTMENT OF CHEMISTRY
THE UNIVERSITY OF ARIZONA
TUCSON, ARIZONA

J. E. MULVANEY