

New Books

W. Theilheimer, *Synthetische Methoden der Organischen Chemie, Repertorium* 3. S. Karger Ltd. Basel (New York), 1949. 412 pages. Price Swiss fr. 40.—.

This is the third of a series of volumes, the first two of which appeared in 1945 and 1948 respectively, the object of which is to record selected new procedures or valuable improvements on existing methods for the preparation of organic compounds. The earlier volumes covered the literature for the periods 1942-44 and 1945-46 and the present volume 1946-47.

The material is arranged according to the method of formation of an individual bond, the different types of reaction being denoted by a system of symbols devised by Weygand. Thus methods of establishing H-O, H-N, H-S, H-C, O-N, O-S, O-C, N-N, N-C, Hal-C, S-C, and C-C linkages by reaction involving addition, elimination, ring opening, ring closure, or rearrangement are reviewed. In the examples chosen, the starting materials, reaction conditions and yields are indicated very briefly, but the original paper, to which the reference is given, must be consulted for more information.

Thus, for example, the formation of an indene derivative by establishment of a C-C-link by a rearrangement involving ring closure under the influence of boron fluoride: In eine Lsg. von 3,4-Di-(p-oxyphenyl)-hexadien-2,4 (formula given) in Chlf. unter Kühlung mit Eiswasser 12 Min. bis zur Sättigung BF₃ eingeleitet u. noch 18 Min. bei Zimmertemp. stehen gelassen → 1-Methyl-2-(p-oxyphenyl)-3-

-äthyl-6-oxyinden (formula given). Roh-A, 92 %. (W. B. s. E. Adler u. B. Häggglund, Ark. Kemi, 19 A, Nr. 23 (1945).)

These publications are, of course, of great value to research chemists engaged on synthetic problems as they provide a readily accessible method of seeking out analogous reactions in the nowadays formidably voluminous chemical literature, and a general perusal of the series gives considerable insight into modern advances on the synthetic side of organic chemical science. The future popularity of "Theilheimer" is dependant on the completeness of its coverage, and the critical sifting of the modern literature, and in the three volumes which have appeared to date, the author has shown that he has been able to master this difficult task most capably. The index is admirably complete, and is at the same time a cumulative index for the three volumes.

H. Erdtman

F. Feigl. *Chemistry of Specific, Selective and Sensitive Reactions*. Translated from the German manuscript by R. E. Oesper. Academic Press Inc., New York, 1949. xiv + 740 pp. \$13.50.

This new book by the founder of the spot test method of qualitative analysis is the theoretical counterpart of the author's laboratory manual *Qualitative Analysis by Spot Tests* (Elsevier, 1946). The book presents "an attempt to summarize our knowledge of the scientific background of the specificity, selectivity and sensitivity of analytical procedures". Specific reactions are such which, under defined experi-

mental conditions, indicate one specified component; selective reactions are those which are characteristic not for one, but for a limited number of substances.

The material is divided into twelve chapters, of which the most valuable ones appear to be those on "The masking and demasking of reactions", "Enhancement of reactivity of compounds and reaction systems", and "The effect of certain atomic groupings on the specific and selective activity of compounds in inorganic analysis" (mostly organic reagents). These three chapters alone contain a wealth of useful material, which should be of interest to inorganic chemists in teaching as well as research. They do, however, make up only about half of the book, and the remaining chapters are not of the same high quality. Especially the large (180 pp.) chapter on "Surface effects in analytical chemistry", although containing much interesting experimental material, is too wordy, and lacks in clarity.

The precursor of the present treatise is Feigl's *Specific and Special Reactions* (Elsevier, 1940. Ca. 200 pp., \$3.50). It is the subject matter of that book which, partly revised and enlarged, constitutes the best chapters of the present one. The reviewer would almost have preferred to miss the new chapters and rather pay a more reasonable price.

In spite of these objections, the book is highly recommended for reference use. It represents a unique source of information for everyone interested in analytical chemistry.

Olav Foss

Analytical Chemistry and Chemical Analysis 1948. Proceedings of the International Congress on Analytical Chemistry, Utrecht, June, 1948. Reprinted from *Anal. chim. Acta* 2 (1948) 417-854. Elsevier Publishing Company, Inc., New York - Amsterdam - London - Brussels, 1949.

The Congress was attended by about 40 British, 16 Belgian, 1 Czechoslovak, 7 Danish, 17 French, 4 Swedish, 5 Swiss and some 250 Dutch chemists and physicists. There were five Sections dealing with: 1. General methods and standardisation (11 papers); 2. Electrical methods (11); 3. Emission spectrography; 4. Optical measurements and physical methods of separation (13); 5. Microbiological methods and detection of traces (10). All papers except those of Section 3 are reproduced in the book.

It is not possible to discuss the separate papers here; however, the Opening Address by the President of the Congress, C. J. Van Nieuwenburg, deserves mentioning. In the Address, "Analytical chemistry and chemical analysis, now and in the future", he discriminates between chemical analysis (routine work) and analytical chemistry (analytical research). Regretting that this science has a low prestige in several European countries, he says that 'Even now a great many universities think that they can do with analytical training simply as a preparatory course, as a simple "technique", which they grudgingly admit has to be mastered before starting "really scientific" work, but which does not deserve a full academic chair. As often as not the situation in industrial laboratories is even worse. They cannot get a sufficient number of analytical specialists from the universities'. One of the purposes of the Congress was therefore to strengthen the reputation of the analytical science by showing, as stated in the Preface, 'the great changes analytical chemistry has undergone in recent years. Because of the demand for greater speed and accuracy and the need for handling small quantities of material, the classical methods based on gravimetric and volumetric procedures are rapidly being replaced or supplemented by physico-chemical and physical techniques. The status of analytical chemistry is being raised to a much higher level, and analyti-

cal chemistry is becoming a science for the specialist.

Modern analysis, with its interests in optical, electrical and microbiological methods, makes very high demands in the training of its practitioners, and it was stressed by speakers from several countries that the training of analytical chemists is a long way behind the requirements of modern industry'.

Olav Foss

Elastomers and Plastomers. Edited by R. Houwink. Elsevier Publishing Company, Inc. I. *General Theory*. 495 pp. II. *Manufacture, Properties and Applications*, 515 pp. (24 fl.).

The two volumes are to be followed by a third on testing and analysis and containing a tabulation of properties.

They will be of interest to all who are interested in that broad science of polymers, which has become so extremely useful to mankind. It is written by a number of the best authorities in the field and the exposition is clear and rather easy to follow.

The first chapter in Vol. I deals curiously enough with a survey of the economic aspects, but for the more or less theoretically minded reader it is useful at once to be reminded of the economic consequences of his fellow-scientists efforts.

The rest of Vol. I contains a mass of valuable material.

The different chapters are well balanced in length according to their importance for the subject. Thus the chapter on the chemical kinetics of "polyreactions" comprises about 100 pages, and the chapter on mechanical properties and on "physics and structure" about 60 pages each. For scientists who are interested in kinetics the

above mentioned chapter is of special interest. One finds here presented in a handy form an account of the main features of the different mechanisms, which have proved valid for the understanding and the technical development of the different types of polymerization-reactions. It is a pleasure to read this well written account of an application of the theory of chain reactions to peaceful ends. This and all the other chapters are provided with extensive lists of references.

A few of the chapters in this volume seem more technological than theoretical, but again it is useful for the theorist to see how the chemical and physical properties of the substances determine the construction of apparatus for the treatment: moulding, hardening a. s. o.

In Vol. II the different plastomers are treated successively, each type in its own chapter. The one (chapter 2) on synthetic resin ion exchangers will be wellcome to many chemists also outside the circle of "plastic-minded" people.

Of course not only products made from artificial polymers, but also products made from natural high polymers are treated. As examples products from natural proteins, natural rubber and natural resin may be mentioned.

Maybe the ordinary chemist will be mostly interested in the productions of the purely synthetic products and their mother substances, e. g. formaldehyde and phenol, which are adequately described. One cannot expect to find factory secrets disclosed in a book like this, but with this proviso also this volume seems to meet the needs of the chemist and also the specialist in this branch of chemistry.

The printing and the paper are as they should be in a book as this of high standard.

J. A. Christiansen