BOOK REVIEWS

Complexometric Titrations. By Gerold Schwarzenbach, Professor of Chemistry at the Eidg. Technische Hochschule, Zürich. Translated and revised in collaboration with the author by Harry Irving, M.A., D. Phil., D.Sc., F.R.I.C., Vice-Principal of St. Edmund Hall, Oxford, and University Demonstrator in Inorganic Chemistry. Interscience Publishers, Inc., 250 Fifth Avenue, New York 1, N. Y. xviii + 132 pp. 15 × 22.5 cm. Price, $3.75.

The general principle of using a complexation reaction for the titration of metal ions has, of course, long been recognized. Until recently, however, only a few applications of complexometric titrations had been made, such as the titration of silver, nickel and a few other metal ions with cyanide ion and the titration of +2 mercury with thiocyanate ion. Studies by Professor Schwarzenbach, begun about 1945, of the unusually stable, and stoichiometrically simple, complexes formed between metal ions and certain polyaminocarboxylic acids (especially nitrilotriacetic acid and ethylenediaminetetraacetic acid) initiated the full exploitation of complexation in the titrimetry of metals.

Professor Schwarzenbach's "Die komplexometrische Titration" which appeared in 1955 (F. Enke, Stuttgart) provided the first comprehensive account of complexometric titrations based on EDTA and similar chelating agents (complexones). The present monograph is a very able translation of the German edition, with considerable revision and rearrangement, and with many additions which bring the treatment up to date. The rapid growth of the subject is reflected in the fact that this edition contains nearly twice as many literature references (305) as the original German edition (181).

The material is presented in seven chapters. The first five survey *seriatim* the complexing properties of polyamines and complexones, the fundamental theory of complexometric titrations, the visual indicators that have been used, the titration of mixtures of metal ions, and practical details on the preparation of standard titrant solutions and indicator solutions. The sixth chapter reports in detail all of the procedures that have been developed. The concluding chapter discusses some limitations, difficulties and probable future developments. The treatment is concise, but admirably lucid.

It is interesting to note that virtually all the titrations described employ visual end-point indication, which, of course, is highly convenient but not very selective. In some cases it should be possible to employ electrometric e.p. detection techniques, whose selectivity ought to be advantageous in the titration of mixtures of metal ions.

In my opinion the only major fault of this excellent monograph is the grouping together of all literature references at the end of the book. These references would have been much easier to use if they had been printed as footnotes in the text.

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Higher Oxo Alcohols. By Lewis F. Hatch, Technical Consultant, Enjay Laboratories. John Wiley and Sons, Inc., 440 Fourth Avenue, New York 16, N. Y. 1957. ix + 120 pp. 15.5 × 23.5 cm. Price, $4.50.

The author's foreword states that "the (oxo) reaction has been little noted except in the patent literature," and one of the purposes of this book is to review this extensive literature. This questionable judgment aside, it is doubtful whether the chapter devoted to the review has added substantially to our knowledge of the oxo reaction.

Since the author concedes the inappropriateness of the term "oxo" to describe the process, how much more inappropriate then his use of the word "oxonating" which has neither the virtue of euphony nor the sanction of general acceptance. "Hydroformylation" which appears only once in the text is a widely-accepted and meaningful term.

The other chapters of the book deal with the properties of the higher oxo alcohols and their derivatives and the industrial applications of these compounds. Commercial producers of chemicals are very conscious of the market's interest in product purity. Even when their product is a mixture, they tend to regard it as "pure," relying on quality control to assure reproducible material. This attitude may help explain the choice of the names "isoöctyl" and "decyl" (why isoöctyl and not isodecyl)) and the avoidance of an etymologically sound prefix like "mixo" which is unambiguous, descriptive, and of unimpeachable derivation (*Chem. Eng. News* **34**, 131 (1956)). "Isoöctyl" alcohol is a mixture of at least five alcohols and "decyl" probably contains ten or more alcohols; it seems odd that the author can report specific gravities to 0.0001, viscosities to 0.1 centipoise, index of refraction to 0.0001, etc.

This little book is packed with valuable information. The writing is polished; most of the photographs, however, are neither interesting nor instructive. The book will be particularly useful to persons interested in the applications of the commercially-available higher oxo alcohols.

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Cahiers de Synthèse Organique. Méthodes et Tableaux d'Application. Volume 1. By Jean Mathieu and André Allais, Ingénieurs-Docteurs. Edited by Léon Velluz. Masson et Cie, Editeurs, Libraires de l'Académie de Médecine, 120 Boulevard Saint-Germain, Paris VI, France. 1957. xi + 232 pp. 16 × 22.5 cm. Price, Broché, 3.800 Frs., Cartonné toile, 4.200 Frs.

This volume is the first of a series of ten to twelve volumes covering all types of reactions of organic chemistry. The material is derived from lectures delivered by one of the authors and possesses an excellent didactic value. Its chief interest lies in its new classification of reactions; for instance this volume describes the different methods of attachment of a function-bearing carbon to an aliphatic chain or to an aromatic ring. Mechanisms of reactions are only briefly discussed before each chapter, a more detailed treatment being reserved for a separate volume "Principes de synthèse organique." The amount of material selected is intermediate between conventional treatises (Fieser, Karrer) and more elaborate compilations such as Houben-Weyl. The subject matter is well chosen and up-to-date, the coverage being complete through 1954. A large amount of practical data are presented in tabular form. Only an alphabetical index of chemical function is given, but the type of classification used throughout the book makes a subject index quite unnecessary. Of special interest for English-speaking readers is the large number of references to English and American publications.

The book is well presented and printed, strongly bound, and will be a valuable addition to libraries of organic chemistry departments, where it will at the same time serve as an excellent introduction to French chemical terminology.

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The Foundations of Quantum Theory. By H. A. Kramers, Late Professor of Theoretical Physics, University of Leiden. Interscience Publishers, Inc., 250 Fifth Avenue, New York 1, New York. 1957. xv + 228 pp. 16 × 23 cm. Price, $6.50.

This is a separate publication of the first five chapters of the author's book "Quantum Mechanics": I. Quantum Theory of Free Particles. II. Non-Relativistic Quantum Theory of Bound Particles. III. The Non-Relativistic Treatment of the Many-Body Problem. IV. Transformation Theory. V. Perturbation Theory.