cussed, as are potentiometric methods, including the special advantages of the concept of the "potentiometric surface." The mechanism of the condensation process is also examined. The final chapter is devoted to the constitution of basic salts in the solid state. Hydrolytic mechanisms are considered briefly as is the role of basic salts in industrial operations such as chrome tanning.

The bibliography of 299 citations appears to touch upon the most important general references of recent date. Its usefulness suffers, however, from a curiously random arrangement of references. The list is neither alphabetical nor chronological, and there is, moreover, no relationship to the order in which the references first appear in the book. For example, a mention (p. 6) of work on tungstate ions by Jander (1933) leads the reader to discover, after a lengthy search, that the only paper cited of which Jander was the sole author (item 9) was published in 1940. He finally settles on item 23, five papers by Jander, Witzmann, Banthien, and Exner, of which two were published in 1933. His decision is supported by observing that the only two prior citations in the book were to items 21 and 22. A few minutes in the library, however, revealed that each of the five papers cited in item 23 carried the names of Jander and one of the other three; the authors of the two papers published in 1933 were Jander and Witzmann.

In the reviewer's opinion a specialized monograph of this type should be a good source of literature references which can be depended upon to lead the reader quickly and with a minimum of effort to the most relevant of the original publications. This is not to say that Professor Souchay has failed to compile an adequate bibliography, but rather to deplore an arrangement poorly suited to the convenience of the reader. Fortunately, this defect does not seriously impair the usefulness of this welcome and authoritative contribution to the specialized literature.

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Chemical Analysis. Complexation in Analytical Chemistry. By ANDERS RINGBOM, Department of Chemistry, Abo Akademi, Abo, Finland. John Wiley and Sons, Inc., 605 Third Ave., New York 16, N. Y. 1963. x + 395 pp. 15.5 × 23.5 cm. Price, $15.00.

This is Volume 16 of "Chemical Analysis," a series of monographs (by various authors) on analytical chemistry and its applications. Its purpose is to serve as a guide for the critical selection of analytical methods based on complexation reactions. The author has extended the treatment of Schwarzenbach as given in the latter's excellent monograph on complexometric titrations. His aim was to show: "how to compare, without involved calculations, existing methods to determine their relative accuracy; how to choose the most favorable experimental conditions for each analysis; how to calculate and eliminate the interference of various side reactions"; and finally, "how to develop new methods for solving special analytical problems."

There are nine chapters in the book; they cover the following topics: complex reactions, complex equilibria, masking, complexometric titrations, acid–base titrations, complexation in ion-exchange analysis, complexation in metal extraction analysis, complexation in electrochemical analysis, and complexation in photometric analysis.

The theory is given in a simple form, but sufficiently correct to permit an analyst to calculate the accuracy attainable with a given method under widely varying experimental conditions. With the aid of diagrams, curves, and tables, speedy calculations may be made, correction coefficients being used to take into account the interference of side reactions. No laboratory procedures are given in the text, but there are many numerical examples to illustrate various types of problems. The methods of calculation are given in detail, many of the problems referring to original papers, thus showing "how empirical methods described in the literature can be improved and how their limitations can be expressed precisely." Indeed, by short calculations it may be proven that a given method is useless or even impossible, thus saving valuable laboratory time. "On the other hand, many new and unexpected solutions of analytical problems can be discovered by a brief critical study of equilibrium constants." At present the approach outline in the book suffers from the lack of values of equilibrium constants for many important compounds, and from the uncertainty of values given by various authors. Hope is expressed that the book will stimulate analytical chemists to determine equilibrium constants missing in the appendix, the selection admittedly being far from perfect. The author makes no attempt to review the extensive literature on the application of complexation reactions in analysis, and only a few select references are given. The book is directed to graduate students and to analytical chemists in research and industrial laboratories who should be capable of developing working procedures on the basis of a few fundamental principles. With the concepts set forth in this monograph, any advanced analytical chemist should be able to apply them in actual practice.

A useful feature of the book is an extensive appendix (82 pp.) which gives tables of values for the following: stability constants of acids, stability constants of metal complexes, solubility products of sparingly soluble metal salts, logarithmic values of $\alpha L(H)$ for ligands, logarithmic values of $\alpha M(L)$ for various metals and ligands, logarithmic conditional stability constants of metal–EDTA complexes, transition points of metal indicators, pH ranges of acid–base indicators, and extraction constants. The book concludes with author and subject indexes. Printing and paper and cloth binding are good.

Analytical chemists who are convinced that "increased application of theoretical principles to chemical analysis is indispensible" will find this monograph a useful and up-to-date treatment of complexation in analytical chemistry.

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Physics and Chemistry of the Organic Solid State. Volume 1. Edited by DAVID FOX, State University of New York, Stony Brook, N. Y.; MORTIMER M. LABES, The Franklin Institute Laboratories, Philadelphia, Pa.; and ARNOLD WEISSBERGER, Eastman Kodak Company, Rochester, N. Y. John Wiley and Sons, Inc., 605 Third Ave., New York 16, N. Y. 1963. xvi + 823 pp. 15.5 × 23.5 cm. Price, $25.00.

This is the first of two planned volumes whose stated purpose has been to bring together the contributions in several disciplines of workers, who have been concerned with the properties of organic solids from a variety of aspects and approaches. To a solid-state physicist whose experience is largely limited to inorganic solids, as is that of this reviewer, the field of organic solids has seemed interesting but formidable in view of the relative complexity of the materials involved and their seemingly infinite diversity. A comprehensive survey of the field is an ambitious project, as this massive volume attests, but the book seems to be a fair compromise betweeen the dual goals of offering further enlightenment to readers, who are already experts in some phase of the field, and of giving nonexperts some idea of what the problems are and what the progress has been. There are thirteen articles in all. Each is most copiously referenced, but there are wide variations in the extent to which a didactic treatment is adopted, ranging from use of an almost self-contained textbook style to another extreme of a compact guidebook to an extensive bibliography. Examples of the former, especially welcome to a nonexpert, are: the treatment "Thermodynamics of Crystals" by E. F. Westrum, Jr., and J. P. McCullough, the several articles on crystal morphology and structure and on crystal growth, and the chapter on "Definition and Attainment of High Purity of Organic Compounds" by G. J. Sloan.

The complete contents are: (1) "Thermodynamics of Crystals" (Westrum and McCullough), (2) "Definition and Attainment of High Purity of Organic Compounds" (Sloan), (3) "Crystal Growth" (G. F. Reynolds), (4) "Thermal Reactions of Organic Solids" (H. Morawetz), (5) "Photochemistry of the Organic Solid State" (H. S. A. Gilmour), (6) "Crystal Form and Crystal Structure" (P. Hartman), (7) "Structure of Surfaces" (W. J. Dunning), (8) "Crystallization of Long-Chain Polymers" (H. D. Keith), (9) "Plastic Crystals" (J. G. Aston), (10) "Visible and Ultraviolet Absorption by Molecular Crystals" (D. P. Craig and S. H. Walmsley), (11) "Infrared Spectra of Molecular Crystals" (D. A. Dows), (12) "Dielectric Phenomena" (C. P. Smyth), and (13) "Electron Transfer across the Boundaries of Organic Solids" (L. E. Lyons).

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