

Where these general procedures do not work, detailed syntheses can be described.

Volume VI contains a total of 69 syntheses and a complete subject and formula index for all the 389 syntheses now published in this series. Inorganic chemists are indebted to Professor Rochow and to the contributors of syntheses for a well written, valuable reference source that should be in the library of every inorganic chemist.

Contributions for Volume VII in this series are invited and manuscripts should be submitted in triplicate to the editor: Professor Jacob Kleinberg, Department of Chemistry, University of Kansas, Lawrence, Kansas. Offers to check syntheses are also welcomed.

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RUSSELL S. DRAGO

**Progress in Inorganic Chemistry. Volume II.** Edited by F. ALBERT COTTON, Department of Chemistry, Massachusetts Institute of Technology, Cambridge, Massachusetts. Interscience Publishers, Inc., 250 Fifth Avenue, New York 1, N. Y. 1960. 399 pp. 16 × 23.5 cm. Price, \$10.50.

The review articles in this volume are of the same high quality as those which appeared in Volume I of the series. They will be very helpful to persons engaged in research in the various fields which are covered, and they will be studied with much interest by many students in inorganic chemistry. Only the budding inorganic chemist, who has invested his own money in the book, is likely to read it from cover to cover. There are many more readers, however, who will profit greatly from reading selected topics.

While reviews such as these result from the rather recently awakened interest in inorganic chemistry, it is probable that their existence will be a growth-factor for the movement. "Progress in Inorganic Chemistry" is a fine addition to the chemical literature.

The number of series dealing with reviews of inorganic chemistry is now large enough to justify some sort of traffic control to avoid duplication of effort. Articles about fluorine chemistry have recently appeared in four different series and some duplication has occurred. By exchanging information before the reviews are written, the editors of the different series should be able to handle this problem.

The volume now being discussed contains the following articles: 1. "Radioactivation Analysis in Inorganic Geochemistry," by John W. Winchester of the Massachusetts Institute of Technology; 2. "Halides and Oxyhalides of the Elements of Groups Vb and VIb," by John W. George of the University of Colorado; 3. "Extraction of Inorganic Compounds into Organic Solvents," by R. M. Diamond (University of California) and D. G. Tuck (University of Nottingham, England); 4. "Some Fluorine Compounds of the Transition Metals," by R. D. Peacock of the University of Birmingham, England; 5. "Intensities of Spectral Bands in Transition Metal Complexes," by C. J. Ballhausen of the University of Copenhagen, Denmark; 6. "Unusual Oxidation States of Some Actinide and Lanthanide Elements," by L. B. Asprey (Los Alamos Scientific Laboratory) and B. B. Cunningham (University of California); 7. "Metal Alkoxides," by D. C. Bradley of the University of Western Ontario, Canada.

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GEORGE H. CADY

**Molecular Distillation.** By G. BURROWS, Research Department, Associated Electrical Industries (Manchester), Ltd. Oxford University Press, 417 Fifth Avenue, New York 16, N. Y. 1960. viii + 214 pp. 14.5 × 22 cm. Price, \$5.60.

The author of "Molecular Distillation" has brought together in an excellent presentation the various phases of the subject under a single cover. In some 200 pages, he thoroughly discusses the subject under the following headings: Basic Theory, Theory of Operation, Representation of Results, Vacuum Techniques, Mechanical Design, Physical Design, Examples of Apparatus, Operation and Control, and Utilization of the Process. An appendix of

values useful to the art and a comprehensive bibliography are included.

The theory is presented from every possible aspect of classical kinetic theory and basic distillation equations. An interesting graphical method for representing results is included which may find great favor among the users of this technique.

Examples of equipment for typical laboratory and commercial scale operations are presented in the discussion of applications and performance. The requirements to produce, maintain and measure vacuum are discussed. The engineering aspects of high vacuum equipment as well as the flow characteristics of gases at low pressures are clearly presented and will be of special interest to the design engineer. The discussion on equipment and still performance favors the achievements of the British workers in which the stationary evaporator is employed. However, the adequate bibliography covers the accomplishments of the American group who made significant contributions to the field both through the use of the centrifugal evaporator and general technique.

Every phase of importance to the successful application of molecular distillation is presented so that the uninitiated will find but little difficulty in getting started in the field. The expert will benefit from those experiences of the author which appear here in print for the first time.

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EDMOND S. PERRY

**Photochemistry in the Liquid and Solid States.** Based on Some of the Papers Presented at a Symposium Held at Endicott House in Dedham, Massachusetts, September 3-7, 1957. Edited by LAWRENCE J. HEIDT, Massachusetts Institute of Technology, ROBERT S. LIVINGSTON, University of Minnesota, EUGENE RABINOWITZ, University of Illinois, and FARRINGTON DANIELS, University of Wisconsin. John Wiley and Sons, Inc., 440 Fourth Avenue, New York 16, N. Y. 1960. vi + 174 pp. 22 × 28.5 cm. Price, \$6.00.

The symposium from which this book was assembled probably had a historic value. It brought together specialists from a variety of fields, each investigating some aspect of photochemical storage of radiant energy. Assembled, these specialists can relate the various facets of the problem of utilization of solar energy. However, the major gains were undoubtedly made in the minds of the contributors who gained a larger view of the impact and direction of their own work. It is difficult to capture these gains in a book.

Nevertheless, this collection of papers has significant value—much of it stemming from the introductory chapter, from the terse but meaty résumés preceding each of the Chapters 2 to 8, and from the final chapter collecting the conclusions.

The chapter titles are: Chapter 1. Introduction to the Symposium Photochemistry in the Liquid and Solid States; Chapter 2. Photochemical Reactions (4 papers); Chapter 3. Photosensitized Reactions (4 papers); Chapter 4. Fluorescence (2 papers); Chapter 5. Kinetic Considerations (1 paper); Chapter 6. Role of the Triplet State (1 paper); Chapter 7. Photochemical Reactions Involving Chlorophyll (7 papers); Chapter 8. Photoreactions in Solids (5 papers); Chapter 9. Conclusions.

There are two notably penetrating and general articles, "Mechanism of Photosensitization in Solution" (G. Porter) and "Kinetic Complications Associated with Photochemical Storage of Energy" (R. M. Noyes). The article "Photoprocesses in Elemental Semiconductors" (G. L. Pearson) gives an excellent résumé of optical processes in semiconductors, understandable to the novice, but without emphasis on energy storage. Twelve of the remaining twenty-one articles (and the one by Noyes) are collected elsewhere, in the January, 1959, issue of *The Journal of Physical Chemistry*.

The content of this book is stated succinctly in the introduction to Chapter 1. "The availability of sunlight, the various ways it might be used photochemically, the limitations, and the ground rules for scientists and inventors are suggested." The book is concluded with the apt remarks "It is clear . . . there is no easy solution . . . by which to