
BOOK REVIEWS

Semi-Conductor Monographs. Preparation of Single Crystals. By W. D. LAWSON, B.Sc., Principal Scientific Officer, Royal Radar Establishment, Malvern, and S. NIELSEN, B.Sc., Ph.D., Senior Scientific Officer, Royal Radar Establishment, Malvern. Academic Press, Inc., 111 Fifth Avenue, New York 3, N. Y. 1958. vii + 255 pp. 14.5 × 22.5 cm. Price, \$8.80.

The scope of the book embraces the basic principles and specific techniques pertaining to the production of metallic and non-metallic single crystals from their liquid and gaseous phases, with particular emphasis on semi-conducting material.

A brief summary of the electrical and optical properties of semi-conductors is followed by a detailed survey of the various methods of growing single crystals.

A variety of equipment for crystal production and the auxiliaries for the control of pressure, temperature, etc., are described in considerable detail.

Three chapters are devoted to purification methods (zone melting, distillation, sublimation, filtration, electro-deposition, extraction, etc.) and to the residual impurity evaluation.

One chapter concerns the preparation of intermetallic compounds with minimal contamination.

The final chapters discuss the various types of defects in single crystals, their detection, causes, and reductions to minimal significance.

An appendix enumerates a list of semi-conductors and some of the physical properties. The bibliography is quite comprehensive.

The authors avoid lengthy mathematical discussion in favor of the practical approach to the large variety of problems involved in the subject to which they themselves have made significant contributions.

The concise presentation of the well illustrated subject matter should render this monograph equally useful to the newcomer and to the already experienced worker in this field.

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Principles and Practice of Gas Chromatography. Ed. by ROBERT L. PECSOK, Associate Professor of Chemistry, University of California, Los Angeles. John Wiley and Sons, Inc., 440 Fourth Avenue, New York 16, N. Y. 1959. xii + 226 pp. 15.5 × 23.5 cm. Price, \$6.75.

The use of gas chromatography as an analytical method, and more recently as a separation method, has shown a remarkable growth since the publication of the basic papers in the field by James and Martin in 1952. This growth can be ascribed to the simplicity of the method, the low cost of the equipment involved, the speed with which analyses can be made, and the power of the method in separating members of a homologous series of compounds. Thus analytical, organic, physical and biological chemists have been quick to adopt the use of gas chromatography as an aid in their work. The need has thus arisen for an elementary book on the subject.

The present book is an outgrowth of a course in gas chromatography given at the University of California at Los Angeles in February, 1959. The course was given as a practical guide for use of gas chromatography by beginners. The contributions of the various lecturers have been edited into a unified text aimed at the same type audience as the course. This editing was well done and there is only a small amount of duplication in the material presented by the various contributors. The writing style has also been carefully edited so the reader is scarcely aware of a change from one contributor to another. The book has been printed by the photo offset process. While this has resulted in a book essentially free of printing errors, it is difficult to read. The binding is attractive but head bands have been omitted.

The book is divided into thirteen chapters and two appendices. In the first two chapters, H. W. Patton discusses various types of elution chromatography and the fundamental principles on which gas chromatography is based. In chapter 3, H. S. Knight discusses the mechanism of separations in gas-liquid chromatography and gas-solid chromatography. In Chapter 4, S. A. Greene considers the parameters involved in the choice and use of the mobile phase (carrier gas). In Chapters 5, 6, 7, 8 and 9, H. S. Knight discussed the stationary phase, column conditions, selection of column type and column construction.

In Chapter 10, S. A. Greene and E. F. C. Cain describe methods of sample introduction, and in Chapters 11 and 12, C. M. Drew considers temperature control of the column and detector and the selection of the detector. In Chapter 13, R. L. Pecsok sums everything up in a discussion of the gas chromatography as an analytical tool.

There are two appendices. The first is a list of manufacturers of equipment. The second is bibliography of the pertinent literature to early 1959. This is arranged chronologically by years and alphabetically within each year. The title of each article is given. This bibliography is an extremely valuable contribution as it contains over 600 references and appears to be quite complete. An index to the subject matter is found at the end of the book. It is rather brief, but will be found adequate for most purposes.

There are a few places where the book could be improved by a few simple changes. One of these concerns the use of abbreviations on some of the figures in Chapters 5, 6, 7 and 8. In some cases these abbreviations are identified in the text, but such "hunting" should be unnecessary. In others, such as in Fig. 7.2, where the abbreviations AA and DAA are nowhere identified in the book, one must look to the original reference to discover that these refer to allylamine and diallylamine, respectively. These names are clearly printed on the figure in the original reference, and it is not obvious to this reviewer why it was necessary or desirable to hide their identity in the book, particularly when no space was saved by the process.

Chapter 9 on column construction is trivial as presented. It would have been better omitted entirely or rewritten to follow the chapters on introduction systems, column heaters and detectors. The chapter could then have presented a discussion of unified system of apparatus suitable for various types of gas chromatography.

The above criticisms do not detract from the basic value of the book. It is highly recommended as an introduction to gas chromatography, and as a basic work book for the effective use of gas chromatography as an analytical method.

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Experimental Nuclear Physics. Volume III. E. SEGRÉ, Editor. John Wiley and Sons, Inc., 440, Fourth Avenue, New York 16, N.Y. 1959. ix + 811 pp. 15.5 × 23.5 cm. Price, \$23.00.

This is the third and last of a series of volumes which were undertaken immediately after the war (the second world war, that is), in order to "bring the experimentalist up to date" in nuclear techniques, significant data and broad theoretical interpretation. As the editor further remarks, "difficulties arising from extended coöperation" prevented earlier completion of that work. One can readily imagine what lies behind that poignant understatement.

Since it is a little late to be preparing the experimental nuclear physicist for the brave new post-war world, let us examine the new book in terms of usefulness to the contemporary experimental nuclear physicist, nuclear chemist or other nuclear scientist who proposes to do experimental work involving the use of radio-active substances. The high energy field, involving mesons and other new particles, is excluded from consideration, except in the last article.