

# NEW BOOKS

POLYPROPYLENE FIBERS AND FILMS, A. V. Galanti and C. L. Mantell (Plenum Press, New York, 181 p., 1965, \$12.50).

The authors' objectives are to "(1) examine the effects of polymer characteristics and fiber processing conditions on the properties of polypropylene fibers and (2) correlate all existing information on the physical, chemical and mechanical properties of polypropylene fibers and comparatively evaluate this material with other fibers, natural and synthetic." While these objectives have been met in admirable fashion, it is interesting to note that the last two words of the title are not included in the objectives and, indeed, a discussion of films takes up only the last one-seventh of the book.

After a cursory discussion of stereospecific polymerization in the first chapter, polypropylene monofilament and fiber manufacturing operations and the influence of processing conditions on properties are considered in some detail in the next two chapters. Here the authors apparently chose not to attempt interpretation of the patent literature, but rather to rely on other texts and on information from Montecatini and the Southern Research Institute. The fourth chapter is most useful, comparing the properties of polypropylene monofilament and fiber to those of other commercial fibers. The fifth and final chapter deals with films, briefly describing methods of manufacture, properties and applications.

This book would serve to introduce to the process engineer the techniques of extrusion and their influence on chemical and physical properties, but is of limited value to the lipid chemist.

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RAPID DETECTION OF CATIONS AND ANIONS, Gaston Charlot, translated by Ralph E. Oesper (Chemical Publishing Company, Inc., 107 p., 1965, \$5).

This book, authored by Gaston Charlot and translated by Ralph E. Oesper represents a significant contribution to the field of Analytical Chemistry. This new edition of the standard French classic on analytical procedures is a marked advance over the previous edition which describes the detection of cations only. This volume includes the determination of an additional 25 anions.

The author presents his topic in a well-organized manner and in refreshingly simple terms. The procedures are straightforward and do not require expensive equipment. They may be performed by the experienced technician. This handy reference text should occupy a prominent position in the student's and analyst's working library.

The author's goal was to develop procedures by which it may be possible to detect each element in the scheme, even in the presence of much larger concentrations of any other element or combination of elements. To achieve this, identifying tests have been employed which possessed the characteristic of specificity or selectivity, sensitivity and reliability.

The scheme is initiated by the preparation of the solutions for test followed by a series of exploratory tests to establish the absence of certain number of anions. Specific tests are then described. Each test clearly outlines the fundamental reaction involved, the reagents employed, procedural details and the sensitivity limit and the specificity of the test.

The type of presentation is carried out for both the cations and anions.

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THIN-LAYER CHROMATOGRAPHY, edited by G. B. Marini-Bettòlo (Elsevier Publishing Company, Amsterdam, London, New York, xi + 232 p., 1964, \$11.75).

This book contains the proceedings of a symposium held at the Istituto Superiore di Sanità, Rome, Italy, in May of 1963. It includes a series of eight plenary lectures, five of which are in English, and twenty contributing papers, seventeen of which are in English. The volume is well organized and produced.

Of particular interest to workers in the lipid field are the articles by F. B. Padley and R. Neher on the thin-layer chromatography of aliphatic lipids and steroids, respectively. Both of these reviews provide thorough discussions of the state of the art as of 1963 and, as exciting new developments have not occurred since, these articles are still current. Contributions describing the separation of phospholipids, steroids, dinitrophenylhydrazanes, and food colors are also of interest.

This symposium volume contains less experimental details than the standard textbooks on thin-layer chromatography. Nevertheless, it is a useful contribution and is recommended for inclusion in libraries of laboratories working with lipids and other natural products.

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ANALYSIS INSTRUMENTATION 1965, edited by L. Fowler, R. G. Harmon, and D. K. Roe (Plenum Press, 240 p., 1966, \$12.50).

This is the third volume in a series started in 1963. It contains 21 papers which represent a selected portion of those presented at the 11th Annual Symposium on Analysis Instrumentation in Montreal, Canada, May 26-28, 1965. They are selected from eight general sessions and grouped on this basis. In a few cases, however, the subject of the paper and the session it is grouped with are poorly related.

The table of contents lists the title of each session, the session chairman, and the titles and authors of the individual papers; however, the lack of session titles in the main part of the book can be an inconvenience to the reader. The index is rather short but adequate. The majority of papers are on process instrumentation; the rest are on laboratory instrumentation. Almost every paper is preceded by an abstract.

The first group consists of three papers from the session on laboratory gas chromatography. These report on factors affecting column efficiencies, quantitation of gas chromatographic data, preparation of relatively heat-stable silver nitrate columns, and the automation of a laboratory gas chromatograph. The second group, consisting also of three papers, is from the session on sample handling. These discuss the requirements and designs of gas sampling devices and sample vaporizers. Only one paper is presented from the session on laboratory instrumentation. It is a comprehensive report on the elements of differential thermometry, its application to calorimetric measurements, and the instrumental requirements. The session on process chromatography follows with the presentation of three papers. They give a detailed description of: 1) a process gas chromatograph employed in an optimization study, 2) procedures for handling maintenance and training manuals for analytical instruments in a large plant, 3) a program to devise a miniaturized gas chromatograph-mass spectrometer combination for space exploration. Two papers are presented from the session on radiation methods. These describe a radiation technique for determining oxygen dissolved in water, and an analysis of variations in the weight density of sheet products employing a radiation gauge to measure density. The session on

electrochemical methods is represented by three papers. One discusses in detail the grounding and shielding of pH circuits. The others describe a device which assures an accurate moisture content in gas standards, and a coulometric method for determination of moisture in chlorine gas. Four papers are presented from the session on optical methods. Two deal with nondispersive infrared analysis. They explain the problems of analyzing highly reactive compounds by this method and the use of discrimination ratios in specific analysis situations. Of the remaining two papers the first reports on the use of a "light pipe" to measure the concentration of sucrose in solution by sensing differences in refractive index and the second on color grading of product streams by a split-beam photometric analyzer. The final session, chemical methods, is represented by two papers. These describe a teflon dropping-mercury electrode for polarography of glass-corroding material, and hollow cathode discharge tubes for the quantitative determination of various isotopes by atomic absorption spectrophotometry, respectively.

The papers are generally well written, quite free of typographical errors and excellently illustrated. The overall number of references listed with the papers is fair. Although the wide diversity of topics precludes a thorough treatment of any one, the book should be useful where a variety of instrumentation is employed. This reviewer feels, however, that this book is overpriced at \$12.50 inasmuch as it is approximately equal in format and content to an issue of some of the better analytical journals.

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PROGRAMMED TEMPERATURE GAS CHROMATOGRAPHY, by W. E. Harris and H. W. Habgood (John Wiley & Sons, Inc., 288 p., 1966, \$11).

The authors state in the preface that programmed temperature gas chromatography (PTGC) has grown to such an extent that it now deserves more complete coverage than can be given by a single chapter in a more general book on gas-liquid chromatography (GLC). This is the first book known to this reviewer to cover the topic specifically and it would make an excellent companion to any of the several more general books on gas chromatography currently available.

The volume is small in size, but gives a complete and authoritative coverage of all aspects of PTGC using both theoretical and practical approaches. The literature is reviewed through 1964, with some references in 1965, and a fair amount of new material is also included. The table of contents and the introduction and summary of each chapter serve as excellent guides for the individual worker to decide what is most pertinent to his own needs. The indices serve their intended purpose quite well.

Tables of data are used effectively and helpful lists, including a lengthy list of symbols at the beginning, are supplied. Figures are numerous and are used to illustrate points made in the text so that brevity and clarity result. In the more theoretical portion of the text, relations are derived in detail so that the book can serve as both a practical laboratory guide and as a reference work.

The occasional user of PTGC, or the person contemplating its use, should read several of the general chapters thoroughly; however, the experienced worker will benefit probably as much from the material contained in those which are theoretical in nature.

The first chapter serves as an introduction to the concepts, terminology and parameters of GLC and PTGC. The following four chapters contain very detailed discussions of the theoretical aspects of PTGC. For the worker who uses GLC as a means to an end rather than an end in itself, reading the excellent summaries and scanning the important points in the text will probably suffice. These chapters cover the various effects of temperature, "the most important single parameter"; retention

theory, as related to retention volume and retention temperature; several approaches to retention theory based on approximations; and column efficiency, or quality of the separations which may be obtained.

The remaining four chapters will be of greatest practical value to the largest number of readers. These cover the identification of materials corresponding to peaks, including the value of gas chromatographic data alone and in combination with chemical or physical confirmation; noninstrumental practical information such as when to select PTGC, selection of operating conditions, limits of detection and errors; practical information on instrumentation requirements; and, finally, a few examples of applications to show the variety of problems for which PTGC is useful.

A laboratory engaged in analysis by GLC, whether or not PTGC is currently utilized, would find this volume a useful addition to the library, as would many individuals using GLC for a large portion of their work. Some instrument manufacturers might also benefit by careful examination of the data presented.

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RESEARCH IN MOLECULAR SPECTROSCOPY, Proceedings (Trudy) of the P. N. Lebedev Physics Institute, Vol. 27, edited by Academician D. V. Škobel'tsyn (authorized translation from the Russian, Consultants Bureau, New York, 205 p., 1965, 8 x 10 paperback, \$22.50).

This volume contains four papers and a bibliographic index of papers published 1934-1962 by the staff of the Optical Laboratory. The unifying theme of the four papers is the determination and application of band shapes and intensities in Infrared and Raman Spectral investigations.

"Investigation of Instrument Distortions and Methods of Correcting for Them in Infrared Spectroscopy," by G. G. Petrash, p. 1-60, provides a survey of problems and concludes with solutions involving Fourier-Transform methods and digital computer processing of data. This section is well written and provides mathematical approaches to optimizing instrument performance and correcting instrumental errors which have not been exploited as much as they should. The mathematical development is rather clearly written.

The second section, written by A. I. Sokolovskaya, is titled "Study of the Effect of Temperature on the Raman Spectra of Substances in Various States of Aggregation," p. 61-108. The author describes original work involving measurement of the shape and intensity of Raman lines, and the effect of temperature. He concludes that an anomalous temperature effect exists which is not explainable by current theory.

In the section by A. V. Rakov, "Investigation of the Brownian Rotational Motion of Molecules of Condensed-Phase Substances by Raman Scattering and Infrared Absorption Methods," p. 109-148, band shape and intensity measurements are used to estimate mean molecular re-orientation times in liquids and crystals.

"Investigation of the Structure and Width of Raman Scattering Lines in Gases Under High Pressure" by G. V. Mikhailov, p. 149-188, describes experiments relating to collision broadening of rotational and vibrational bands of oxygen, nitrogen and methane.

The papers are well written and provide an excellent introduction to a topic that is growing in importance in molecular spectroscopy. An occasional mistranslation, such as the use of "twin wave" for "double beam" does not seriously reduce the readability.

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