

BLOCK AND GRAFT COPOLYMERS, by R. S. Ceresa. (Butterworths, 196 pp., 1962, \$7.50.) The author points out that at the time of publication of this book, more than two thousand linear and grafted block copolymers have been synthesized. Even though reviews dealing with this class of polymers have appeared at regular intervals, these have not been capable of keeping up with the rapidly expanding literature of the subject. In this book, the author has attempted to collect the bulk of the available information within one volume and has included the syntheses of fourteen hundred block copolymers. Consequently, he has sacrificed the readability of the book but has made available a reference book of inestimable value to the polymer research chemist. He has drawn extensively from the patent literature as well as from journal articles dealing with the mechanisms of synthesis of block and graft copolymers. In general, however, mechanistic approaches and discussions have been sacrificed in favor of the more applied aspects of syntheses and useful physical properties of the products discussed.

After a brief introduction to the structure of block and graft copolymers, the author has devised and introduced a new system of nomenclature for polymers of this type. This nomenclature system upon initial examination, appears quite cumbersome and difficult; however, the highly complex nature of the copolymers being discussed requires some organization and the nomenclature system presented appears to do an adequate job.

The introductory chapter is followed by the following topics: transfer and addition syntheses, chemical syntheses, radical and irradiation syntheses, mechanico-chemical syntheses, condensation syntheses, ionic syntheses, industrial syntheses, characterization of block copolymers, and properties of block copolymers. While it is recognized that an exhaustive treatment of each of these major topics of polymer synthesis is not possible in a single volume of this type, certain techniques for initiating block and graft copolymerization are treated in an inadequate manner, while others are treated in an entirely adequate manner. For example, ozonolysis as a means of initiating active sites on polymer chains is barely mentioned while the use of gamma-irradiation is adequately covered.

Under the topic heading of characterization of block copolymers, the author has included experimental details for many of the techniques discussed, so that this volume may double as a laboratory manual in many instances. All topics are referenced quite adequately, and the reader has ready access to the original publication in most cases. The book includes adequate subject and author indices, although some errors are apparent. In addition, an extensive and extremely valuable copolymer index has been included which gives the reader a rapid means of locating a particular copolymer system.

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VISCOSITY AND FLOW MEASUREMENT; A LABORATORY HANDBOOK OF RHEOLOGY, by J. R. Van Wazer, J. W. Lyons, K. Y. Kim and R. E. Colwell (Interscience Publishers Div., John Wiley and Sons, New York, xx + 406 pp., 1963, \$14.00). The author set out to fill the large gap between practical rheological measurements and the complex mathematical theory which has developed in this field. One can question how well this ambitious goal was achieved. One cannot question the outstanding value of the book which has resulted from their attempt. This book is not only valuable but practically essential in any laboratory which must measure consistency of a variety of materials. Whenever the measurement of time dependent or temperature dependent flow behavior warrants measurement, this book will greatly aid in choice of the proper measuring device.

The authors have given a detailed description of the advantages and disadvantages of each of the important viscometers. Operating directions are sufficiently clear to

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allow an intelligent choice of the rheometer for any practical problem in rheology.

The Monsanto Chemical Co. is to be commended for supporting this work. It is sure to become a standard for practical rheological measurements. Every product development chemist who is concerned with consistency problems of his product should have this book available for ready reference.

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ADVANCES IN FOOD RESEARCH, Vol. XI, edited by C. O. Chichester, E. M. Mraz, and G. F. Stewart (Academic Press, New York, 454 pp., 1962, \$15.00). This book comprises reviews of six diverse subjects by experts in the respective fields: 1) The Chemistry of Protopectin (M. A. Joslyn); 2) Utilization of Natural Polysaccharide Gums in the Food Industry (M. Glicksman); 3) The Chemistry of Tea and Tea Manufacturing (W. H. Stahl); 4) Enzymic Reactions in Foods of Low Moisture Content (L. Acker); 5) The Action of Benzoic and Salicylic Acids on the Metabolism of Microorganisms (I. Bosund); and 6) The Nature and Role of Fluid Consistency in Food Engineering Applications (S. E. Charm).

The chapter on protopectin chemistry is a highlight, due to its thorough coverage of the field. However, in this reviewer's opinion, the chapter would have benefited from a more selective approach to isolation and characterization techniques, and by additional organization and subject headings in the text. This chapter is for the serious researcher with specific interests, rather than the casual reader.

The section dealing with natural polysaccharide gums, highly application-oriented in its approach, discusses representative seaweed extracts, plant seed gums, and tree exudates. Starches and pectins, although similar in many applications to these natural gums, are specifically excluded by the author due to detailed coverage in other publications. A helpful feature of this chapter is the inclusion of tables giving much detail on gum applications in a wide variety of foods. The application information plus the comparison of properties of different gums should interest many food scientists.

In his chapter on the effects of benzoic and salicylic acids on microbial metabolism, Dr. Bosund has briefly but capably summarized recent findings. In a challenge for future research, Bosund recommends emphasis on the metabolic effects of additional structurally related compounds and study of a wide variety of microorganisms, rather than direct examination of food preservative effects.

The chapters on tea, on low-moisture enzyme reactions, and on fluid consistency are all current in coverage and supply generous background material with ample references.

Because of the diversity of subjects included and variation in approach to each topic, Vol. XI offers something worth while to most food chemists. For the same reasons, few will find the entire book of value. The quality of printing and binding are good; the book has infrequent typographical errors. A welcome addition to Vol. XI is the cumulative index to Vols. I-X.

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CHEMISTRY: A SURVEY OF PRINCIPLES, by G. W. Ewing and E. Gerald Meyer (John Wiley and Sons, ix + 239 pp., 1963, \$4.95). This small book is intended for a one-semester terminal course in chemistry which has high school algebra as its only prerequisite. Other recent books for this purpose have emphasized either descriptive chemistry or chemical principles. The latter is the major concern of this one. The introductory chapter deals with chemical notation, weight relations, and sizes of particles. A discussion of the chemistry of four representative elements follows in Chapter 2. Subsequent chapters are concerned with nuclear

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chemistry, periodic relationships and electronic structure, chemical bonding, redox and acid-base reactions, states of aggregation of matter, and chemical kinetics. The final three chapters on organic, inorganic, and biochemistry are descriptive and give summary accounts of a few selected topics of recent research interest.

Sixteen laboratory experiments are found at the end of the book. In general, these are conceptually very good; they are not written in a "cook book" fashion, and they require the students to do some of the planning of the experimental procedures themselves. To this reviewer, this approach is academically sound, but it would seem to require rather close supervision of most students in order for meaningful results to be obtained in the usual allotted time.

The major fault of this book appears to be its extreme brevity even for a one-semester terminal course. For a book of only 190 pages of textual material, that 15 of these should be taken up by full page portraits of the heroes of chemistry would seem to be excessive even to one who bemoans the lack of the historical approach in most modern texts. The brevity of the text also leads to many oversimplifications which are incorrect and for which no apology is made. To cite an example, the pH of 0.2 M sulfuric acid was calculated to be 0.40!

This book touches on many of the topics of vital interest in chemistry today, and an effective and interesting course could be organized around it. The instructor will not feel pressed for time and may either expand on the topics introduced or enter into others of his own interest.

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ZONE MELTING OF ORGANIC COMPOUNDS, by E. F. G. Herington (John Wiley and Sons, Inc., 162 pp., 1963, \$5.95). This small volume provides the most complete source of information on zone melting of organic compounds now available. The chapter headings which follow indicate the scope of this work: 1) A short history of zone melting and zone refining; 2) Theory; 3) Important factors; 4) Experimental techniques; 5) Pure materials; 6) Some applications of zone melting; 7) Study of phase relationships by directional-freezing and zone-melting experiments; 8) Zone leveling; and 9) Related separation techniques. After a careful exposition of the theoretical basis for zone melting and directional freezing, the author points out the practical consequences of the theoretical treatment and describes the apparatus devised by various investigators for zone melting of organic compounds both above and below room temp. To summarize quickly, the text provides all the information needed by the beginner to set up an apparatus for the purification of organic compounds by zone melting. In addition the reader obtains a bonus in the chapters on the handling of highly purified materials, and on the use of other methods of purification related to zone melting.

The average American reader will probably find some of the parts used by the English workers to construct their apparatus, for example, "Sindayo" disks and contrate wheels, as interestingly uninformative as did the reviewer. Fortunately the excellent diagrams remove any difficulties due to this. A list of 121 references is included with reasonably up-to-date coverage since 22 of these are to papers published in 1961 or 1962. This book can be recommended happily to those organic chemists who wish to initiate the use of zone melting. The crucial question here is—who are these chemists? Herington gives two answers to this question. In his preface he states "Whereas the chemist of today reports that a new compound was 'recrystallized to a constant melting point' the chemist of tomorrow will, no doubt, state that his compound has been 'zone refined to a constant melting point.'" But in conclusion he suggests, "The advantages of zone refining are such that this very convenient method is likely to play an increasingly important role in the routine preparation of pure organic compounds."

After reading this informative text the reviewer would reduce these claims a bit further. Zone melting is clearly an effective means of purification when the substance to be purified and the impurities satisfy certain phase criteria. These render the method most useful for final purification of a substance whose impurity content has already been reduced to less than one percent. The problems associated with setting up the zone refining process for a new system seem great enough to state that routine use of this method is not likely in the near future. Inspection of the list of compounds which have been purified by zone melting indicates a far greater applicability to aromatic than to aliphatic compounds. The oil chemist will note with interest that some waxes and stearyl alcohol have been purified in this way. Zone melting seems best adapted to purification where an extremely pure sample (>99.99%) is desired, or to concentration of a minor impurity to a level where it can be identified.

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COLOR: A GUIDE TO BASIC FACTS AND CONCEPTS, by R. W. Burnham, R. M. Hanes, and C. James Bartleson (John Wiley & Sons, ix + 249 pp., 1963, \$9.25). This book, the result of a study sponsored by the Inter-Society Color Council, presents "a statement of the basic principles which should be included in any elementary teaching of color." The authors employ an outline format in which each explanatory statement is intended to be self contained and thus to be useable even taken out of context. The coded outline provides for the ready cross references needed to point out the various existing interrelations that a simple outline arrangement alone cannot show. The general plan of organization in the outline proceeds from an organized inventory of basic and relatively unquestioned facts, then to approved applications of certain important facts, and

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finally to a statement of marginal fact or facts on which there is less general agreement.

The introduction discusses the concept of color. Section I, Basic Facts, contains chapters on the definition of color; color stimulus, receptors, and response; variations in the normal color response; and defective color vision. Section II, Applied Facts, contains chapters on facts basic to color-stimulus measurement; colorimetry; color discrimination measurement; object-color systems; and color names—a form of color specification. Section III, Marginal Facts, contains chapters on color-vision theory; the assessment of color aptitude; and experimental color aesthetics. The text has many appropriate illustrations, with 16 pages in full color. A reference section contains 296 items, many published in the last decade. The index is extensive and refers to the outline code instead of page numbers.

This book is unique in the authority and prestige it acquires both from the recognized professional status of the authors and from that of the collaborating colleagues in the sponsoring Inter-Society Color Council. This adds weight to their selections made to present "the facts, as distinguished from fancy, of color," as well as to their adoption of "a set of color terms that conform as nearly as possible to common technical and commercial usage, but terms that are carefully defined and consistently used within the outline." This feature will probably be a source of most of the criticism that is certain to arise, since no set of selections can contain all pet conventions of nomenclature. Many specialists in colorimetry would prefer the use of the term, absorbancy, instead of the term, optical density (p. 33), to give a trivial example.

According to the authors, this book is primarily for the educator, to serve as a course outline for an instructor academically prepared to teach a course in color, to serve as a compact and reliable reference for a student who has completed a course based on the outline and to serve as a basis for writing textbooks on color. It is not an elementary textbook on color for a beginner. However, it should be a valuable reference book for workers in the field of color, particularly for the specialist who desires to widen his scope in this area.

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World Tallow Production Report

Tallow and grease production in the world's major producing countries was estimated at 7.2 billion lb in 1962, down slightly from the peak year of 1961. Lower output in the U. S. and Canada more than offset gains in practically all of the important producing and exporting countries, according to the USDA.

In the U. S. there was a 6% decline in the production of inedible tallow. Lower prices for tallow apparently discouraged some firms from collecting and processing meat fats in the last half of 1962.

There was higher production in Argentina and Brazil as well as in the United Kingdom, France and Australia.

Exports from the world's leading producing nations (excluding Communist bloc countries) totaled 2,373 billion lb in 1962, down 4% from 1961. The U. S. exported 1,617 billion lb; Australia 269 billion lb; with New Zealand, West Germany, and Canada exporting most of the rest.

The six EEC countries accounted for one-third of U. S. tallow and grease exports. All countries in the EEC, except Italy, took less in 1962 than in 1961, and the total amount shipped to EEC was down by 6.5%.

Japan continued to take more than any other country, although U. S. exports to Japan in 1962 fell to 268 million lb from 402 million lb in 1961.

The F.A.S. says world production and trade in 1963 likely will exceed that of 1962. U. S. production is expected to increase moderately.

what
never goes
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...always
stays
down?

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New Books

(Continued from page 29)

ADVANCES IN PETROLEUM CHEMISTRY AND REFINING, VOL. VII. Edited K. A. Kohe and J. J. McKetta, Jr., Dept. Chemical Engineering, The University of Texas, Austin, Texas. (Interscience Publishers, Div. of John Wiley & Sons, New York, N.Y. 1963 XIV + 483 pp., \$19.75). This recent volume represents an excellent addition to a valuable series of books. This volume certainly accomplishes the original goal set by its editors to "present at annual intervals a collection of progress reports written by leading authorities on particular subjects." This particular volume should be of interest and value to all persons interested in petroleum and related industries. The book should be read by all chemical engineers, industrial chemists, and research directors who desire to be informed of the latest developments in a variety of pertinent areas. Graduate students in chemical engineering, chemistry and related fields also would find the contents valuable.

The "reports" are written clearly in reasonable depth and include extensive literature references valuable in case the reader desires greater detail.

Although practical applications and technology are stressed, sufficient theoretical information is presented to serve all readers.

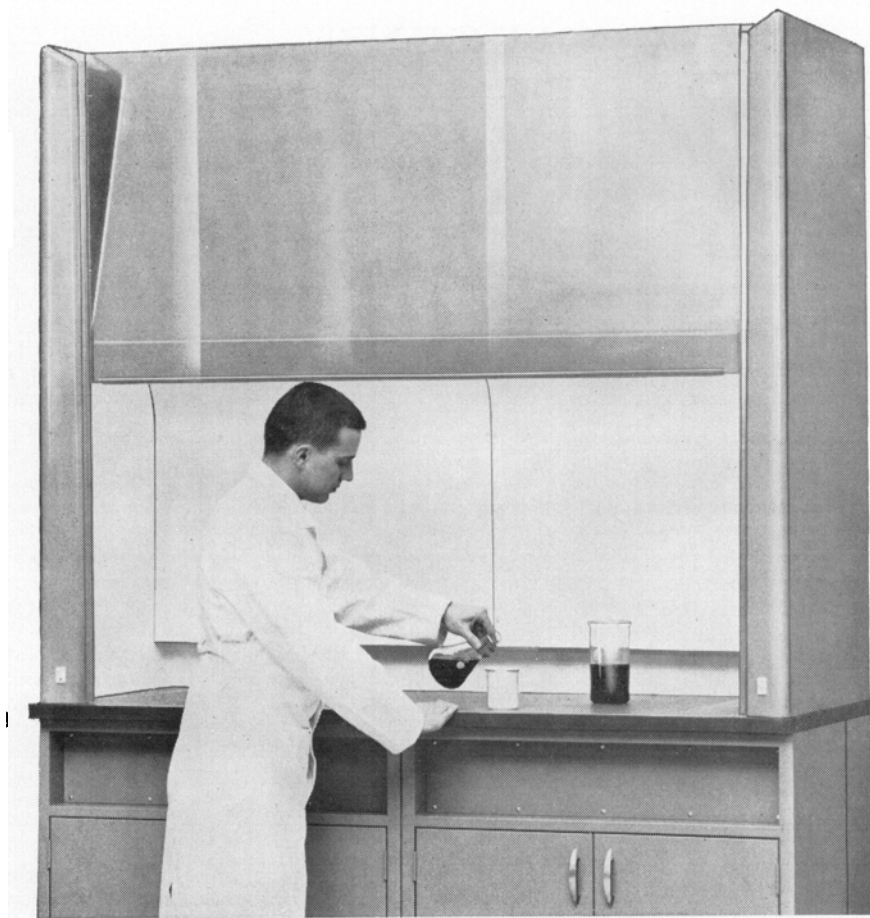
The extent and variety of the subjects covered in the book is best seen from the following outline:

- I. Economics and Future Trends.
 1. Lubricating Oil Additives
- II. Unit Operations and Design
 1. Foam and Emulsion Fractionation
 2. Fuel-Handling Problems in the Jet Age
- III. Refining Processes.
 1. Hydrogenation of Catalytic Cracking Charge Stacks
 2. Polymerization of Olefins as a Refinery Process
- IV. Petrochemical Processes.
 1. Synthetic Pesticides from Petroleum
 2. Polyvinyl Chloride
 3. Preparation of Petrochemicals through Ionizing Radiation.
- V. Mechanical Equipment.
 1. Free-Piston Engines

The reports were written largely by authorities working in their areas of specialization. In all, twenty different authors or co-authors were involved in the nine different chapters.

The book is relatively free of typographical errors; only a few misspelled words were noted.

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