sections on the applications of x-rays to polymer chemistry, that it arouses admiration not so much for its usefulness as for its display of skill in packing so much into so little space. But the authors deserve praise for covering so wide a range with such dependable accuracy.

The emphasis of the book is on physical chemistry rather than on technology, and on a broad treatment of the subject rather than on a few topics of interest to specialists. It has apparently been the particular concern of the authors to relate the chemistry of high polymers to the classical physical chemistry of small molecules (as is explicit in the preface). If they succeed in doing that, they will remove for many the uncomfortable feeling that the arcana of high polymers constitute a science all their own.

The four years that have elapsed between the writing of the book and its publication have, in so rapidly developing a field, resulted in some gaps in the account. Even today, however, there is no other volume that answers the important purpose for which this one was written. As for the gaps, they can be taken care of by the use of recent review articles which, without the prior preparation given by this book, adopt too advanced a tone for most chemistry graduates.

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Preparation of Organic Intermediates. David Allen Shirley. New York: Wiley; London: Chapman & Hall, 1951. 328 pp. $6.00.

This book is a compilation of procedures for the preparation of a variety of organic compounds. These procedures have been taken from readily available published literature. Confronted with these facts, it is of more than passing interest to examine the author's reasons for believing this compilation to be of value and in what fashion he has tried to avoid the shortcomings of similar compilations such as Vanino's *Handbuch*. These reasons are set out in a one-page preface. In view of its importance, it is unfortunate that the author did not devote more space and effort than this in an analysis of the problem.

The compounds included were selected on the basis of the following criteria:

(1) The compound either is not available commercially or if available is relatively expensive; (2) directions for preparation of the compound had not been included in *Organic Syntheses* through Volume 28; and (3) the compound is one whose structure is simple and contains reactive functional groups which make it useful as an intermediate, or its preparation involves a generally useful type of organic reaction and the directions may be applied to the preparation of related compounds.

In addition, the starting materials meet the following criteria:

(1) The material is available commercially at relatively low cost; (2) the preparation of the material has been given in *Organic Syntheses*; or (3) the preparation is given in another place in this book.

The following comments on these criteria occur to this reviewer. Although it is not so stated, a great many of these preparations involve safety hazards that would probably make them unacceptable for *Organic Syntheses*. In the text the author italicizes safety precautions in over 25 instances. Also, many of the preparations are so like those already given in *Organic Syntheses* for closely related compounds that they would probably never be included. Examples are the preparations of *p*-fluorobenzyl bromide, 6-methylquinoline, *n*-octadecyl iodide, *n*-valeronitrile, *p*-bromobenzoyl peroxide, and α-furil. There are many others.

In many instances, the reactions described are either lacking in novelty or strikingly similar to other preparations also included in the volume. Examples of the first type are the straightforward esterifications (pp. 148, 157, 162), the formation of acid chlorides using phosphorus trichloride (p. 156), the malonic ester synthesis (p. 154), and the preparation of an alkyl cyanide from an alkyl bromide (p. 298). Examples of the latter are the preparations of acrylyl (p. 3) and crotonyl chlorides (p. 89) from the corresponding acids by interchange with benzoyl chloride. Many other examples will be obvious to the reader.

This reviewer believes that the author has undertaken a task for which the expenditure of any conceivably rational effort is grossly disproportionate to the value of the results. In the face of this situation, the author has presented as commendable an account of his efforts as can be expected.

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Scientific Book Register

The Theory of Atomic Spectra. Reissue. E. U. Condon and G. H. Shortley. New York: Cambridge Univ. Press, 1951. 441 pp. $11.00.

Statistical Design and Analysis of Experiments for Development Research. Donald Statler Villars. Dubuque, Iowa: Brown, 1951. 455 pp. $6.50.

Materials Technology for Electron Tubes. Walter H. Kohl. New York: Reinhold, 1951. 493 pp. $10.00.

The Black Carib of British Honduras. Viking Fund Publications in Anthropology, No. 17. Douglas MacRae Taylor. New York: Wenner-Gren Fdn., 1951. 176 pp.; 7 plates. $2.50.

Agricultural Chemistry: Practical Applications of Agricultural Chemistry, Vol. II. Donald E. H. Frear, Ed. New York: Van Nostrand, 1951. 588 pp. $9.50.

Vertebrate Sexual Cycles. W. S. Bullough. London: Methuen; New York: Wiley, 1951. 117 pp. $1.50.

The Temporomandibular Joint. Bernard G. Sarnat, Ed. Springfield, Ill.: Thomas, 1951. 148 pp. $4.75.

Les Conditions Ecologiques et le Peuplement des Vases d'Eau Douce. Encyclopedie Biogeographique et Ecologique, Vol. VI. Franklin Pierre. Paris: Paul Lechevalier, 1951. 104 pp.; 8 plates. 1800 fr.

Theory of Perfectly Plastic Solids. William Prager and Philip G. Hodge, Jr. New York: Wiley; London: Chapman & Hall, 1951. 264 pp. $5.50.

Handbook of Basic Microtechnique. Peter Gray. Philadelphia: Blakiston, 1952. 141 pp. $3.00.