

central area since that time. This is the period which has witnessed spectacular contributions to our knowledge of protein structure and conformation, to the nature and function of active sites of transferase, dehydrogenase, and transaminase enzymes, to theoretical and practical aspects of multisubstrate enzyme kinetics, to the mechanism of action of a large number of different types of enzymes, and to the coenzymatic functions of biotin and vitamin B<sub>12</sub>—and this by no means exhausts the list. All these developments would have some bearing on the central topic of this book. No doubt, analogous developments would have occurred no matter when the publication of the volume; there is always a hiatus between the time when of necessity revision must cease and the actual date of publication, as this reviewer knows only too well. But again, perhaps by being less comprehensive, this lag might have been shortened for the most crucial portion.

In summary then this volume will constitute a valuable reference work for anyone interested in inhibitor action, no matter at what level, and no matter what his field; it accounts well for and interprets sometimes brilliantly developments up to 1960, and it will remain a lasting monument to one man's devotion to one important area in molecular biology, with most of contemporary biochemistry as the backdrop.

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**Handbuch der Analytischen Chemie.** By W. FRESENIUS and G. JANDER. **Zweiter Teil, Qualitative Nachweisverfahren, Band IV a $\alpha$ , Elemente der Vierten Hauptgruppe I.** By H. GRASSMANN. Springer-Verlag, VI, Heidelberg Platz 3, Berlin-Wilmersdorf (West), Germany. 1963. 220 pp. 17  $\times$  25.5 cm. Price, steif geheftet DM 57; ganzleinen DM 61.

Quantitative analysis eclipses qualitative, but from time to time every analyst is confronted with detection problems and requires reliable sources of information on procedure. The second part of the admirable Fresenius-Jander Handbuch consists of a series of volumes on qualitative analysis. This volume, belonging to that part, deals with carbon and silicon. Dr. Grassmann meets the difficulty posed by the coverage of the compounds of carbon by limiting his treatment to "seine wichtigsten einfachen Verbindungen." He includes, besides the element itself, carbides, hydrocarbons (methane, ethane, propane, ethylene, acetylene), the oxides, phosgene, cyanogen, cyanide, thiocyanate, formic acid, acetic acid, and some others. The methods described range from simple precipitation and color reactions to those of the modern analytical armamentarium: spectrography in all its forms, mass spectrometry, gas chromatography, neutron activation, etc. The presentation is compact; literature citations are ample.

The section on silicon, approximately 50 pages, deals with the detection of the element, silicic acid, quartz and other oxides, and silicates in general and some in particular. Full use is made of physical methods, but much can still be done by classical slide and color reactions, and these are not neglected.

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**Characteristic Frequencies of Chemical Groups in the Infra-Red.**

By M. ST. C. FLETT, Research Chemists, Imperial Chemical Industries, Ltd. (Dyestuffs Division), Blackley, Manchester. American Elsevier Publishing Co., Inc., 52 Vanderbilt Ave., New York 17, N. Y. 1963. ix + 98 pp. 13  $\times$  19.5 cm. Price, \$4.50.

The author of this monograph rightly points out in his Preface that infrared spectroscopy is a completely established tool in the armamentarium of the modern organic chemist and that the wide spread availability of simple infrared spectrometers in research laboratories has confronted such workers with the need to reliably translate infrared spectra of organic compounds into useful structural information. This monograph is a contribution designed to aid those to whom infrared spectroscopy is not an end in itself but rather a means to an end, namely structural analysis.

In the opinion of this reviewer the subject monograph, in the main, achieves its author's goal and will be a welcome and much used desk reference in the organic laboratory, especially for those who want quick access to correlation charts of the characteristic frequencies of chemical functional groups or to literature references dealing with the salient spectral features of specific classes of commonly encountered organic compound types.

The advice provided by the author in his Introduction is good and should be heeded by the user. The provision of both wave number and wave length scales throughout the text was wise and allows for easy use by members of both schools of thought. One wonders why the author elected to consider only the carbonyl frequencies of anhydrides and esters as strong absorbers (use of heavy, black, vertical lines) and not such classes as the ketones, carboxylic acids, and amides in view of the fact that later in the text as on pp. 48, 34, and 22,  $A$  or  $\epsilon$  values are provided which show these to be commensurate in intensity with the anhydrides and esters. The degree of precision used in indicating the positions of the absorptions bands throughout the text is often inconsistent, excessive, and certainly unnecessary. Figures good to one part in 8000 are sometimes used in expressing the wave length when the frequency is only known to one part in 1100, e.g., items  $d$  and  $e$  on p. 45. Also inconsistent are the references to band ranges as 745–730 (13.4–13.7) in one instance and 1312–1330 (7.62–7.52) in another on the same page (e.g., 43). The characteristic frequency values quoted for the various chemical functions appear reliable and, where uncertainties exist, these are indicated. Considered as a whole, the format of this monograph is good and the text free of typographical errors (only one was found on p. 54 where hydrocarbons was misspelled). The Table of Contents and Index seem adequate and material easily found even without their use. The cost is sufficiently low to make it easily accessible to all having need of it. This monograph, while no substitute for such texts as Bellamy's "Infrared Spectra of Complex Molecules" and Jones and Sandorfy's "Chemical Applications of Spectroscopy," should nevertheless find its way to every organic chemist's shelf as a ready reference.

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**Progress in Physical Organic Chemistry. Volume 1.** By SAUL G. COHEN, Department of Chemistry, Brandeis University, Waltham, Mass., ANDREW STREITWIESER, JR., Department of Chemistry, University of California, Berkeley, Calif., and ROBERT W. TAFT, Department of Chemistry, Pennsylvania State University, University Park, Pa. John Wiley and Sons, Inc., 605 Third Ave., New York 16, N. Y. 1963. ix + 411 pp. 16  $\times$  23.5 cm. Price, \$15.00.

This is the first volume of a new series which aspires to become a forum for exchange of views and for critical and authoritative reviews. Physical organic chemistry is described as being concerned with investigations of organic chemistry by quantitative and mathematical methods.

This first volume comprises five chapters: "Ionization Potentials in Organic Chemistry," by A. Streitwieser, Jr. (30 pp.); "Nucleophilic Aromatic Substitution Reactions," by S. D. Ross (44 pp.); "Ionization and Dissociation Equilibria in Solution in Liquid Sulfur Dioxide," by N. N. Lichtin (34 pp.); "Secondary Isotope Effects," by E. A. Halevi (114 pp.); and "Quantitative Comparisons of Weak Organic Bases," by E. M. Arnett (182 pp.)

These chapters differ in character, from the first chapter's illuminating focus on the main features of a rather new field, to thoroughgoing reviews in the last two chapters. Nevertheless, each is a valuable contribution in its own way. The series is off to a good start. (This reviewer will, however, offer criticism in another context of certain judgments in one of the chapters.)

Clearly, every library with an organic chemistry collection should possess this book.

Despite the quality of this volume, success is not promised either for the volume or for the series. That it will be financially successful for the publishers seems certain. Library sales alone, at this rich price for a slim volume, will no doubt more than cover costs. Perhaps the publishers have thought of this. But that it will be successful as a medium of communication is doubtful.

Were this series the only one of its type catering to the field of physical organic chemistry, it would perhaps become the forum