
 BOOK REVIEWS

Advances in Analytical Chemistry and Instrumentation. Volume I. Edited by CHARLES N. REILLEY, Department of Chemistry, University of North Carolina, Chapel Hill, North Carolina. Interscience Publishers, Inc., 250 Fifth Avenue, New York 1, N.Y. 1960. vii + 445 15.5 × 23.5 cm. Price, \$12.00.

This is the first volume of a planned continuing series, whose volumes will appear annually. Each volume will comprise a collection of review articles dealing with a variety of analytical topics. The intention is that these articles will avoid "a dry and terse cataloguing of the literature without description or evaluation," and that they will fill a purported need "for critical, comprehensive articles surveying various topics on a high level, satisfying the specialist and non-specialist alike." By and large the seven articles in this initial volume fulfill these aims.

The first article on *Tetraphenylboron as an Analytical Reagent* by H. Flaschka and A. J. Barnard, Jr., occupies 118 pages and is probably the most comprehensive discussion of this reagent which has yet appeared. Wittig, Rafi and their co-workers about 1949 first suggested tetraphenylboron as a precipitation reagent for potassium, and most of the subsequent studies have been concerned with this particular application. However, the tetraphenylboron salts of rubidium, cesium, ammonium, silver, +1 thallium, tetraalkylammonium, various alkaloids and other amine bases are also only slightly soluble and procedures for their determination have been proposed. This chapter describes all of these applications, with emphasis, of course, on the determination of potassium. Much of the text pertains to the remarkable variety of titrimetric methods based on precipitation of potassium tetraphenylboron that have been proposed to circumvent one or another difficulty of the gravimetric technique, or, if would seem in some cases, merely for the sake of novelty. Analytical procedures are presented in detail, and in most cases typical performance data are given.

The next article on *Recent Advances in Gas Chromatography Detectors* by R. B. Seligman and F. L. Gager, Jr., is true to its title in that it concentrates on the various physical means of evaluating the composition of the vapor effluent from a gas chromatographic column. Few analytical techniques have enjoyed such immediate acceptance, and have developed so rapidly, as gas chromatography. Scarcely eight years have passed since James and Martin published the paper which launched this subject. The writer recalls very vividly hearing a lecture on gas chromatography at a Gordon Research Conference in August, 1954, at which recent date the technique was still unknown to most of the professional analytical chemists in attendance. Today it would be hard to find an industrial analytical laboratory which does not utilize this powerful tool. Consequently this article should have many readers.

The 48 page article on *Trends in the Determination of Fluorine* by C. A. Horton provides a concise review of methods in use prior to 1953, and then a detailed discussion of methods developed since then. The treatment is limited to the determination of fluoride in inorganic compounds. In the author's words "An attempt is made to point out the difficulties and shortcomings of both the prior and recent methods for the determination of fluoride, and to challenge analytical chemists toward development of more satisfactory methods and techniques." Certainly he has succeeded in this aim, particularly in the last section on *Challenges for Future Investigation*.

A 40-page essay on *New Ideas in Organic Microanalysis* by W. Schöniger is an authoritative review of newer developments in the cloistered field of organic elemental analysis. Since Dr. Schöniger is well known as the inventor of the closed flask combustion technique, one might have expected that much space would have been devoted to it. On the contrary, it is mentioned, all too briefly, in only two paragraphs. Although one can admire the author's humility in not emphasizing his own work, nonetheless this technique is so truly novel and valuable that it is disappointing that it was not described and discussed more adequately.

The fifth chapter on *Theory of Electrode Processes* by W. H. Reinmuth is much too short to do justice to its broad title. The author quite obviously is intimately conversant with his subject, but in the short span of 51 pages he has been able to do little more than mention the many recent developments in this complex field and provide a comprehensive bibliography. It would have been better if the scope of this chapter had been restricted so that fewer topics could have been discussed in greater depth.

The 50-page essay on *The Analytical Chemistry of Thioacetamide* by E. H. Swift and F. C. Anson critically reviews the use of this reagent for the precipitation of metal sulfides. Thioacetamide is the most promising of the several substances that have been proposed as substitutes for hydrogen sulfide, but, as Professor Swift and his co-workers have demonstrated, the reactions by which it causes precipitation of metal sulfides are far from simple. Anyone who thinks that thioacetamide can be used indiscriminately as a general substitute for hydrogen sulfide should study this article. He will learn that the physical properties of metal sulfides precipitated by thioacetamide are, indeed, usually much better than by precipitation with hydrogen sulfide. However, he will also learn that the optimum conditions for the quantitative separation of metal ions are, in general, not the same with thioacetamide as with hydrogen sulfide. He will come to the realization that a great deal more fundamental study will be needed to prepare thioacetamide for the ambitious role in which it has been cast by the overly-optimistic advertising literature of chemical manufacturers.

In the last chapter (77 pages) on *Near-Infrared Spectrophotometry*, Robert F. Goddu describes the unique analytical utility of the neglected 1 to 3 micron spectral range for organic functional group analysis. Unfamiliarity with this special field renders me incompetent to judge this treatment with a critical eye. However I can testify that Dr. Goddu writes with the kind of clarity that reflects intimate experience with the subject.

The volume has been skillfully edited and very well manufactured. The only important editorial fault—and I admit that "fault" is a matter of opinion—is that references to the literature have been arranged in a manner most convenient to the printer, who does not have to use them, and most inconvenient to the reader who is expected to use them; namely, as neat alphabetical lists at the end of each article.

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Biophysical Science. A Study Program. Planned and Edited by J. L. ONCLEY, Editor-in-Chief, F. O. SCHMITT, R. C. WILLIAMS, M. D. ROSENBERG and R. H. BOLT. John Wiley and Sons, Inc., 440 Fourth Avenue, New York 16, N. Y. 1959. viii + 609 pp. 21 × 27.5 cm. Price, \$6.50.

It has long been the hope of molecular biologists that many if not all kinds of biological phenomena can ultimately be analyzed in terms of basic physical and chemical laws. This possibility, considered unthinkable a century ago, is still disparaged in many quarters. On one end of the scale, there are those who believe that physics and chemistry have no place in biology. On the other end of the scale, there are some who hold that the existing laws are inadequate to account for the behavior of the extraordinarily complicated materials found in biological systems; that different physical-chemical laws are needed to describe biological processes in the same manner that new laws have been formulated to describe the behavior of aggregates of ions in the solid state. If this latter point ultimately proves to be correct, the role that biological research will play in establishing these new laws of macromolecular behavior will probably be dominant.

The intimate relation that already exists between our understanding of biological phenomena and the behavior of macromolecules, and indeed the progress in this latter area that has already come from biological research is amply illus-