

It is very logical to discuss first all of the theoretical development, second irreversible properties such as conductance and diffusion, third the heat and volume functions and finally the free energies and activities, and this method makes a fine reference book, but it makes reading or study very difficult.

The errors in the treatment of the thermodynamics of the galvanic cell and in the first derivation of the Debye-Hückel potential which were noted in my review of the First Edition¹ still persist. The Brønsted theory of specific ion interaction includes the relation which most of us, but not Harned and Owen, call the Harned rule. Since this latter rule is discussed at great length one would expect a clear presentation of the Brønsted theory, but there was no part of the former editions which needed more drastic revision. Unfortunately the changes are trivial and no improvement at all.

The collection and correlation of experimental results is the most valuable contribution. The focus is quite properly on the work at Yale and similar work elsewhere, but there is remarkable freedom from pushing pet theories of the authors. Emphasis is placed upon precision work with simple electrolytes. Except for very brief excursions into hydration and into micelle formation with the aliphatic carboxylate ions, the only chemical reaction discussed is the association of weak electrolytes.

I repeat with even more conviction the summarizing sentence of my former review, "Every worker in the field will be grateful to the authors for the labor they have spent collecting and coordinating this material, and will need to have a copy easily accessible."

(1) THIS JOURNAL, 66, 1043 (1944).

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Surface Active Agents and Detergents. Volume II. ANTHONY M. SCHWARTZ, Harris Research Laboratories, Washington, D. C., JAMES W. PERRY, Center for Documentation and Communication Research, Western Reserve University, Cleveland, Ohio, and JULIAN BERCH, Harris Research Laboratories, Washington, D. C. Interscience Publishers, Inc., 250 Fifth Avenue, New York 1, N. Y. 1958. xv + 839 pp. 16 × 23.5 cm. Price, \$17.50.

The tremendous growth of the literature on surface active agents led the authors to restrict Volume II to developments during the 1947-56 period. Their original intention was to revise Volume I which was compiled by the first two of the present three authors. The vast number of carefully documented references attest to the activity in the field and the attempts at completeness. As a source book, therefore, this book deserves a place on the chemists' bookshelf.

Numerous advances recorded in the literature since 1956 make it apparent that Volume II already lacks freshness. This reaction is heightened by the curious arrangement which parallels Volume I. After an introduction covering economics and general technological considerations, processes for manufacturing surfactants are given in Part I. There follows in Part II a miscellaneous group of subjects including surfactants for special functions such as germicides, fungicides and anticorrosive action, both inorganic and organic builders, both qualitative and quantitative analysis and then biological effects. Part III attempts to survey recent advances in the physical and colloidal chemistry of surfactants and ends with a non-critical survey of the complex field of detergency. Finally, Part IV comes back again to practical applications such as cleaning in its various aspects, medical and cosmetic uses, uses in the mineral, building, agricultural, leather, paper, foil, plastics, paints, petroleum and chemical industries. The arrangement seems involved and space-consuming to this reviewer.

The presentation of theoretical developments in Part III is largely disjointed and incomplete, possesses a number of

minor errors and, all in all, is not very useful. While this book is meant to be mostly technological, a more coherent theoretical treatment would be helpful to all readers. Such a presentation is not easy to achieve in a brief space because of rapid developments.

Furthermore, it is difficult if not impossible for the authors to be critical and authoritative in so many areas. For example, in the discussion of hemolysis (p. 372), the relation between penetration of cholesterol model membranes on water by surfactants and their hemolytic activity (Pethica and Schulman) was not brought out. Again, in the discussion of detergency and cleansing, solubilization is brought up in several places; it is not pointed out, however, that most washing (except the hands) is done below the critical micelle concentration where solubilization is scarcely a factor. The coating chemist can hardly be helped by the vague accounting of the Applications in Paints and Coatings (pp. 689). Separation into groupings on uses as dispersing agents, as wetting agents, as medicinal agents, etc., may have helped to avoid such a burden. It should be emphasized, however, that the survey of types and processes for manufacture in Part I will be quite valuable to many readers.

Typography is excellent and few typographical errors such as those evident in the first letters of the lines in the middle of p. 448 mar the context.

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Naturally Occurring Quinones. R. H. THOMSON, D.Sc., Ph.D., F.R.I.C., Lecturer in Organic Chemistry, University of Aberdeen. Academic Press, Inc., 111 Fifth Avenue, New York 3, N. Y. 1957. vii + 302 pp. 14.5 × 22.5 cm. Price, \$9.00.

Among the oldest of known organic compounds, quinones have been of interest to many organic chemists since the beginning of the science. Their chemistry is complex and the multitude of reactions which they undergo forms a fascinating chapter of organic chemistry. They occur widespread in nature and come from the most varied sources; many have had important uses which antedate the elaboration of any systematic chemistry. Some are dyes, others are fungicides and disinfectants. Some have been used as medicines, others are toxic. Some are antibiotics, some have been isolated from bacilli, some are vitamins.

Professor Thomson's book is a valuable addition to chemical literature, for in it he has gathered together all of the naturally occurring quinones. For each quinone the sources are given, the isolation is described, the physical properties are listed, and finally the proof of structure is given in quite some detail. The book is not—and is not intended to be—a complete discussion of the chemistry of quinones. It is rather a detailed catalog of quinones, with enough of the chemistry, and a complete outline of the proof of structure, so that there is presented a comprehensive picture of the quinones occurring naturally. The discussions are adequate, well written, and extremely well documented. There are three indexes: zoological, botanical and general and these indexes contribute greatly to the usefulness of the book as a reference.

There is a brief introduction, and this is followed by five chapters: benzoquinones (30 compounds, 159 references); naphthaquinones (40 compounds, 309 references); anthraquinones (70 compounds, 331 references); phenanthraquinones and miscellaneous quinones (8 compounds, 35 references); extended quinones (aphins, hypericin, pseudohypericin, fagopyrin, 51 references).

The paper and printing are excellent and the book-making is good. Altogether a first-rate contribution to the literature.

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