

**Systematic Analysis of Surface-Active Agents.**

M. J. ROSEN and H. A. GOLDSMITH. Interscience, New York-London, 1960. xvii + 422 pp. \$13.50.

As the preface states, the text, *Systematic Analysis of Surface-Active Agents*, is "an attempt to fill a need which has long existed for a comprehensive treatise on the analysis of surface-active agents." The authors have attempted to classify all the existing literature on the analysis of surface-active agents into sections such as Detection, Isolation and Estimation; Qualitative Analysis; Quantitative Analysis; and Separation. This they have done quite well, and the text provides a convenient catalog of existing literature.

A reviewer must find a weak point, and in my opinion, there is a lack of sufficient emphasis on instrumental methods of analysis, especially in the area of infrared absorption. The authors state on page 4; "Among the newer tools, spectrographic methods offer special promise, but much remains to be done in the field." Actually, infrared has been in use over 10 years in this field and is the most useful single tool one can apply. Ultraviolet analysis has been in use over 15 years. Both fields are quite fully developed. In my 12 or so years in surfactant analysis, I have found that over 90% of the unknowns received were identified by infrared analysis, separation techniques being applied to mixtures and then IR used on the isolated components. The chapter on qualitative analysis, spends about six pages on physical methods (2 $\frac{1}{2}$  on infrared) and 74 pages on the "wet" tests. The main advantage of infrared is speed of analysis and conclusiveness. Not only can the surface-active agent be quickly classified, but it can also be actually specified exactly.

Ultraviolet analysis and x-ray diffraction are given but a brief mention (one or two pages each), and these also are valuable methods, though not so generally useful as infrared.

The reviewer gets the distinct impression that the authors are wet analysts or chemists, since the text leans so heavily on chemical tests.

I am sure the field will welcome this text, since it does serve to catalog the existing literature, especially the "wet" techniques. It may be possible in future editions to expand the instrumental portion of the text to best express the field in its true perspective.

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**Epoxyverbindungen und Epoxydharze.** A. M. PAQUIN. Springer-Verlag, Berlin, 1958. xx + 833 pp. DM 88.

The epoxy resins have been among the most rapidly maturing fruits of polymer science. In the mid-thirties, Pierre Castan discovered the curing of diepoxides with anhydrides or amines—condensation reactions proceeding with only small shrinkage and producing no volatile by-products. During the forties, intensive research in laboratories on both sides of the Atlantic led to outstanding new coatings, electrical potting compounds, resins for reinforced plastics, adhesives, and plasticizer-stabilizers. Commercial exploitation began in earnest during the last decade; and now, in the United States alone, half a dozen resin manufacturers vie

with a hundred formulators and a thousand end-users to brighten the pages of the trade press with sagas of technological conquest.

Dr. Paquin has prepared a scholarly compendium of the science of epoxides and epoxy resins, with references going into 1957. Beginning with ethylene oxide, he presents a comprehensive summary of the preparations and reactions of epoxides which should make the book valuable to workers in many fields. Chapters on epichlorohydrin, polyphenols such as bisphenol A, epoxy resin intermediates, hardening and hardeners, and applications make up the main portion of the book. Discussions of testing and analysis, trade literature, patent lists, and indexes complete the volume.

Castan himself has provided a thoughtful and philosophical introduction.

Paquin's work differs in approach from two books entitled *Epoxy Resins* which have been published in the United States, one by Lee and Neville (McGraw-Hill, 1957), the other by Skeist and Somerville (Reinhold, 1958). Paquin has sought to be complete; the American authors have preferred to be selective and critical, with greater emphasis on formulation and end-use technology.

This book is a most convenient reference source for the chemist bent on making or breaking an epoxide ring.

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**The Sequestration of Metals: Theoretical Considerations and Practical Applications.** R. L. SMITH. Macmillan, New York, 1959. vii + 256 pp. \$8.50.

This book will be of interest to persons engaged in developmental research in agricultural, biochemical, pharmaceutical, photographic and analytical research, since the author has compiled a great deal of data relating to the sequestration of metals in these fields. His approach is simple, straightforward, and on a level that can be comprehended by anyone with an elemental knowledge of chemistry.

While reading the book, however, the reviewer was appalled by the number of typographical errors and little inconsistencies which occurred in the text. It appeared that a competent proofreader was needed rather than a reviewer. Many of the errors are inexcusable. A few of the more pertinent errata are as follows:

The author states, "A benzene group instead of a methyl group slightly weakens the acid properties." He cites the following dissociation constants to prove his point:

$$\begin{array}{l} \text{Acetic} \quad k = 1.75 \times 10^{-5} \\ \text{Benzoic} \quad k = 6.3 \times 10^{-5} \end{array}$$

It is quite obvious that benzoic acid is actually a *stronger* acid than acetic, since its dissociation constant is larger. On the same page the author gives the value for the second ionization constant of succinic acid as  $k_2 = 2.8 \times 10^{-4}$ , whereas, the value should be  $2.8 \times 10^{-6}$ . The statement that, "The case of malonic acid is intermediate between oxalic and succinic," is true with respect to  $k_1$  but is not borne out by the data in the case of  $k_2$ .

On page 56 the author has been inconsistent through use of  $K_2$  and  $K_{11}$  for the same quantity. Furthermore,  $(M^1)(Y^2) = (M^1)(Y)$  should read  $(M^1)(Y)^2 = (M^{11})(Y)$ .