

There is no index, but the arrangement is so systematic (alphabetic when necessary) that it is an easy matter to find any particular one of the thousand or more systems mentioned. The only guide to the book is a brief table of contents which, moreover, is unfortunately confused and incorrect in eight or nine entries, an inexcusable lapse in a book of such pretensions and cost. The table of contents calls for a section on "Alloys of Thorium," for pp. 1089-1141. There is no such section in the book, and those pages are taken up by part of a rather irrelevant article, of about 50 pp., on coins (denominations, compositions, etc.) entitled "Alliages Monétaires." This is a more or less historical account, in particular of French coins; it has no true scientific interest whatever, although it may be of value to mints, museums, and coin collectors.

Despite this inexplicable lapse, the presentation throughout the volume in general is orderly, systematic, and clear, accomplishing a valuable coverage not only of the possible systems but also of a significant variety of aspects of the important systems. The treatment is thorough and even to some extent critical. The style is of course essentially that of the preceding volumes. The quality of the whole effort is certainly to be praised.

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Colloidal Surfactants. Some Physicochemical Properties. By KOZO SHINODA, Department of Chemistry, Yokohama National University, Minamiku, Yokohama, Japan, TOSHIO NAKAGAWA, Research Laboratories, Shionogi Pharmaceutical Company, Imafuku, Amagasaki-shi, Japan, BUN-ICHI TAMAMUSHI, Tokyo Women's Christian College, Suginamiku, Tokyo, Japan, and TOSHIZO ISEMURA, Department of Biology, Osaka University, Kitaku, Osaka, Japan. Academic Press Inc., 111 Fifth Ave., New York 3, N. Y. 1963. 310 pp. 15.5 × 23.5 cm. Price, \$11.50.

Despite a number of shortcomings, this book is a necessary part of the library of anyone studying or using surfactant solutions. The four sections, written by different authors, but presumably under the general direction of Dr. Shinoda, differ very greatly and will be described separately in this review.

The first section, "Formation of Micelles," is the shortest and may well prove to be the most controversial and at the same time the most useful. It is useful because it contains an enormous amount of data in tabular form, together with references to the original sources so that the user can judge for himself with respect to the important characteristics of purity of materials and accuracy of measurement. Dr. Shinoda gives here a complete exposition of the point of view that micelles are to be regarded as a separate phase in the thermodynamic sense. This point of view has been shown by K. J. Mysels and others to be not strictly correct, and it is difficult to predict whether a "little" mistake in thermodynamic treatment will or will not be important.

The section is also extremely useful because it makes available a great deal of work published in Japanese, and thus not readily usable by most investigators outside Japanese-speaking areas. It is surprising that so little recognition has been accorded to the fact that the dye method of determining the CMC is known to give erroneous results and that tables showing the variation of the CMC with various structural properties are assembled with values using the dye method and other methods mixed indiscriminately.

The second section on nonionic surface active agents presents a very competent review of what is known of their physicochemical properties and interpretation. One cannot help but be impressed by the fact that there is still a very great deal of work necessary to understand their behavior, particularly with reference to phase-rule diagrams. It is useful to have the necessity for working with chemically pure materials so strongly emphasized, but it is rather doubtful that some of the data quoted represent work on adequately pure substances.

The last two sections on adsorption and monomolecular layers, respectively, contain necessarily a certain amount of duplication. That by Dr. Tamamushi is particularly clearly written, but again, shows up the need for further work. It is useful to find

clear emphasis on the fact that surfactant solutions with maxima in adsorption isotherms as functions of "concentration" must be systems containing three or more components, analogous to the case of surface tension minima. That by Dr. Isemura does not discuss sufficiently the problem, which exists when polymeric materials are adsorbed at surfaces, as to the extent to which loops project rather deeply into the bulk of the solution and as to whether or not this represents an equilibrium condition. A considerable amount of the work which has been done at the Weizmann Institute seems not to have been taken into consideration.

One of the most valuable aspects of the book as a whole is the enormous number of references to original papers from all parts of the world, even though it is far from complete. The commercial importance of surfactants has resulted in the publication of so large a volume of data that a book such as this would be of value just for its help in telling an investigator where to look for what. The reviews of the status of theoretical concepts in the various sections are not in any way intended by the reviewer to be overshadowed by this emphasis on the value of the extensive bibliography. Dr. Shinoda and his colleagues are to be congratulated on doing a good job on a very difficult subject to summarize.

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Isotopenaustausch und Substitution des Wasserstoffs in organischen Verbindungen. By A. I. SCHATENSTEIN. Veb Deutscher Verlag der Wissenschaften, Berlin W. 8, Niederwallstrasse 39, Germany. 1963. 365 pp. 17 × 24 cm. Price, \$67.60.

The present volume, number 8 in the series "Physikalisch-chemische Trenn- und Messmethoden," is a German translation of Schatenstein's book which was published by the Academy of Sciences in Moscow in 1960. Some new material from the years 1959 and 1960 has been incorporated by the original author.

To the reviewer's knowledge there exists no monograph in any language similar to the present one, which treats hydrogen substitution and, in particular, hydrogen isotope exchange from the point of view of acid-base theory. The work is a compilation rather than a critical survey. Since the author and several other Russian chemists have made important contributions to the field and the original language makes their papers somewhat difficult to read for most scientists in other countries, the value of the translated edition of the book is evident. Thus, for instance, Section 4.5 gives access to the theories concerning the dissociation of acids and bases as formulated by the school of Ismailov.

The translation seems to be good, and relatively few errors have been introduced by this procedure. Most errors of that type are also too obvious to be harmful; for instance, the translation of equilibrium constant by rate constant on p. 225 or the errors introduced in reproducing the mathematical equations (3a and 5) on p. 70. Somewhat worse are the translation "1,2,3-Trimethoxy-4,6-ditritiumbenzol" for a compound containing tracer amounts of tritium in the positions referred to (the Russian name is not misleading in this way) and the decimal errors introduced in the reproduction of Table 63. In some respects, the German edition has a more clear typographic arrangement than the original. Its table of contents has a more far-going breakdown, and the different sections have been equipped with a helpful decimal system. As most Russian books, the original lacks a subject as well as an author index. The German edition lacks the latter and has a rather scanty subject index.

In spite of its merits, the German edition of Schatenstein's book is not likely to find an appreciable market within the United States because there is already a translation into English. In addition to the language, the latter has the advantage of a much more moderate dollar price.

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