

The authors have accomplished what they define as their goal. The one omission in literature coverage which would add to the value of the chapter on the liquid state concerns the experimental data available from X-ray studies of the liquid state. Some fine studies starting as early as 1938 and carrying through current literature would enhance, had they been cited and incorporated in the discussion, the consideration given to the liquid state.

The reader of the monograph is certainly to be rewarded; it is highly recommended to the novice as well as to those well versed in the field or related fields. One of the rewards in perusing the book will certainly be insight into new research ideas. The monograph can have many uses beyond those of scientists in their personal libraries. It could serve as a text for a seminar in the subject, or as supplementary reading in courses in physical chemistry, thermodynamics, and phase equilibrium.

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**Kinetics and Mechanism.** Second Edition. By A. A. FROST and R. G. PEARSON. John Wiley and Sons, Inc., 440 Park Avenue South, New York, N. Y., 1961. 387 pp. 15.2 × 22.8 cm. Price, \$11.00.

This book is a partial revision of the earlier edition (1953) with the same title. The main changes are additions of sections on polar reactions and pressure effects to the chapter on simple gas reactions (Chapter 6), and the inclusion of a new chapter (Chapter 11) on rapid reactions, to which has been transferred some of the material on flow reactions from the earlier book. The new chapter also includes a treatment of encounter-controlled reactions, and very brief descriptions of the techniques for studying very fast reactions. Otherwise the book remains essentially unaltered except for the use of a slightly more readable print.

In the opinion of this reviewer, this text continues to be the most satisfactory one on the market for use in a general introductory course in chemical kinetics. The emphasis is on mechanism determination, as the title implies, and this is the approach to kinetics which is unequivocally of value to all breeds of chemist. There are no errors of logic in the treatment, and only a few mechanical ones (such as the mistaken reference to eq. 46 on p. 47). One would hope that in the Third Edition, if such is contemplated, a more carefully thought out and systematically arranged treatment of reactions in solution (Chapter 7) could be developed. However, this is undoubtedly the least satisfactory aspect of modern reaction kinetics, and the textual inadequacy perhaps reflects only the experimental and theoretical shortcomings in this area. All in all, this is a good book, and can serve as a very suitable classroom text, if not as a comprehensive reference work.

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**Hydrogen Compounds of the Group IV Elements.** By F. G. A. STONE, Department of Chemistry, Harvard University, Cambridge, Massachusetts. Prentice-Hall, Inc., Englewood Cliffs, N. J., 1962. 112 pp. 16 × 24 cm. Price, Text Edition \$3.95; Trade Edition \$5.25.

In this monograph Dr. Stone has produced an interesting and easily read volume. This brief presentation of some recent research into the chemistry of the group IV hydrides should serve to stimulate interest and promote further work in this field. As an avowed critical survey of the field, however, it falls short of its mark. Mainly, it fails in this aim because it surveys the

field in a rather cursory fashion and because there is a general lack of critical evaluation throughout.

As a result of these shortcomings the reader who intends to become well informed as to current research progress in this field could be misled. Thus, in the chapter entitled "General Considerations" a lengthy footnote is devoted to a description of the possible bonding in a compound reported by Fritz and Grobe as arising from the pyrolysis of tetramethylsilane and erroneously identified by these workers as 2,4,4-trimethyl-2,4-disila-2-pentene, which would possess a silicon-carbon double bond. A more complete and careful survey of the literature would have presented an earlier paper by Knoth and Lindsay describing the preparation of a compound with identical analysis and properties and properly identified as 1,1,3,3-tetramethyl-1,3-disilacyclobutane. Also exemplary of the casual nature of this survey is an instance where the characterization of potassium silyl is noted and reference made to recent work of Ring and Ritter, who isolated this most interesting compound. In this case there was failure to note the original preparation by Johnson and Isenberg, cited by Ring and Ritter in their paper. Similarly, in the discussion of methods of preparation of silanes, the reaction of silicon tetrachloride with lithium aluminum hydride to produce silane is noted and a statement made to the effect that the method can be extended to the preparation of  $\text{Si}_2\text{H}_6$  and  $\text{Si}_3\text{H}_8$  from  $\text{Si}_2\text{Cl}_6$  and  $\text{Si}_3\text{Cl}_8$ , respectively. The preparation of  $\text{Si}_2\text{H}_6$  by this reaction is described by Schlesinger and co-workers in one of the references cited by Dr. Stone, but this reviewer has been unable to find any reference in the literature to the preparation of  $\text{Si}_3\text{H}_8$  by the reaction described. In fact, as far as we are able to determine, silane appears to be the sole volatile silicon hydride obtained when  $\text{Si}_3\text{Cl}_8$  is treated with lithium aluminum hydride.

Where a satisfyingly complete survey is presented, such as the discussion of the various kinds of structural evidence for multiple bond character in silane derivatives, there is no evaluation of divergent points of view. While the reader is impressed with the author's neutrality some critical guidance would be appreciated and useful in a volume of this kind.

In summary, Dr. Stone, more reporter than critic, performs a useful function in gathering many references together in a highly readable form, while failing to produce a comprehensive or critical survey which would give confidence and guidance to a reader less well informed than Dr. Stone. The book is well worth the reading and the paucity of research effort, as indicated by the rapidly diminishing chapter size from "Germanes" to "Stannanes" to "Lead Hydrides," should act as a stimulant for the inorganic chemist desiring to do research in an uncluttered but highly interesting and significant field.

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## BOOKS RECEIVED

December 1, 1962–February 1, 1963

- G. M. BARROW, "Introduction to Molecular Spectroscopy." McGraw-Hill Book Co., Inc., 330 West 42nd Street, New York 36, N. Y. 1962. 313 pp. \$11.75.
- K. BIEMANN. "Mass Spectrometry." McGraw-Hill Series in Advanced Chemistry. McGraw-Hill Book Co., Inc., 330 West 42nd Street, New York 36, N. Y. 1962. 360 pp. \$13.75.
- P. B. D. DE LA MARE AND W. KLYNE. "Progress in Stereochemistry." Volume 3. Butterworth Inc., 7235 Wisconsin Avenue, Washington 14, D. C. 1962. 376 pp. \$13.50.
- R. T. SANDERSON. "Teaching Chemistry with Models." D. Van Nostrand Co., Inc., 120 Alexander St., Princeton, N. J. 1962. 168 pp. \$5.75.