Critical Evaluation of Rate Data for Homogeneous, Gas-Phase Reactions of Interest in High-Temperature Systems. D. L. BAULCH, D. D. DRYSDALE, AND A. C. LLOYD. School of Chemistry, The University, Leeds LS2 9JT, United Kingdom. Available from senior author.

These are three reports in a continuing series of critical evaluations on gas phase reaction rate data. The data sheet format is used. Rate data are tabulated for each reaction, together with an indication of the method used and the evaluators' comments that pertain to the values listed. References are provided for each reaction.

The first report, dated May 1968, has rate coefficient data for the following reactions:

$$CO + OH = CO_2 + H$$
$$CO + OD \rightarrow CO_2 + D$$
$$CO + O = CO_2 + h\nu$$
$$CO + O = CO_2$$
$$CO + O + M = CO_2 + M$$
$$CO_2 + O \rightarrow CO + O_2$$

The second report, dated December 1968, treats the following eight reactions of hydrogen and oxygen:

$$H_2 + O \rightarrow OH + H$$
$$OH + H \rightarrow H_2 + O$$
$$H_2 + OH \rightarrow H_2O + H$$
$$H + H_2O \rightarrow H_2 + OH$$
$$H_2O + O \rightarrow OH + OH$$
$$OH + OH \rightarrow H_2O + O$$
$$H_2O + M \rightarrow H + OH + M$$
$$H + OH + M \rightarrow H_2O + M$$

The third report, dated May 1969, treats the following reactions:

$$O_2 + H = O + OH$$
$$O + OH = O_2 + H$$
$$O_2 + H + M = HO_2 + M$$
$$HO_2 + M = O_2 + H + M$$
$$H_2O_2 + H = H_2 + HO_2$$
$$H_2 + HO_2 = H_2O_2 + H$$
$$H_2O_2 + H = H_2O + OH$$
$$H_2O + OH = H_2O_2 + H$$
$$H_2O_2 + OH = H_2O + HO_2$$
$$H_2O + HO_2 = H_2O_2 + OH$$
$$H_2O_2 + M = OH + OH + M$$
$$OH + OH + M = H_2O_2 + M$$

Properties of Water and Steam in SI-Units, kj, bar 0-800° C; 1-1000 bar (Including a Mollier h,s-Diagram and a T,s-Diagram). E. SCHMIDT, ED. Title No. **1495**, 205 pages, Springer-Verlag, New York, 1969, $12.00.

These tables of the properties of water and steam were calculated in their entirety by using a set of equations accepted by the members of the Sixth International Conference on the Properties of Steam under the title, "The 1967 IFC Formulation for Industrial Use." Deviations from the figures computed became necessary for smoothing only in small areas of isobaric specific heat capacity. For the most part, the tables on transport properties were also based on internationally accepted sets of equations. The quantity symbols and unit symbols used are those found in international standards. These tables are mainly intended for use in industry. They are edited in concurrence with the major engineering institutions in a large number of countries and represent a valuable contribution towards international cooperation. These tables take the place of a new edition of the former version B (published in 1963) of the "VDI-Wasserdampftafeln."

Semiconducting II-VI, IV-VI, and V-VI Compounds. ABRIKOSOV, N. KH. *et al.* Plenum Press, New York, 1969. 260 pp. in English, translated from Russian by A. Tylbulewicz; original, 1967.

This monograph deals with semiconducting compounds formed from elements of groups II, IV, or V and sulfur, selenium, or tellurium. The monograph describes the crystal structure of these compounds, and presents the published data on their polymorphic transitions, including transitions observed at high pressures, published *P-T-X* diagrams for the compounds discussed, and a method for plotting the diagrams. The more important physiochemical properties of the compounds are also given: the forbidden band width, carrier mobility, effective masses of carriers, electrical conductivity, and thermoelectric power. The monograph consists of three chapters. The first deals with chalcogenides of elements in group II: zinc, cadium, and mercury. The second discusses semiconducting compounds of elements in group IV: germanium, tin, and lead. The third describes investigations of compounds of elements of group V: arsenic, antimony, and bismuth. The monograph does not cover chalcogenides of elements in group III. Also excluded are data on semiconducting glasses. The monograph includes the published data up to the second half of 1966 on the crystal structure, physicochemical properties, and phase diagrams of important semiconducting compounds which are used in various branches of engineering.

NBS Monograph 25-7. Standard X-Ray Diffraction Powder Patterns. Section 7. Data for 81 Substances. SWANSON, H. E., *et al.* 188 pp. Superintendent of Documents, U.S. Government Printing Office, Washington, D. C. 20402.

Standard x-ray diffraction powder patterns are presented for 81 substances. Forty-five of these patterns represent experimental data and 36 are calculated. The experimental x-ray powder diffraction patterns were obtained with a Geiger or proportional counter x-ray diffractometer, using samples of high purity. All d-values were assigned Miller indices determined by comparison with computed interplanar spacings and from considerations of space group extinctions. The densities and lattice constants were calculated, and the refractive indices were measured whenever possible. The calculated x-ray powder diffraction patterns were computed from published crystal structure data. Both peak height and integrated intensities are reported for the calculated patterns.

Physical Properties of Molecular Crystals, Liquids, and Glasses. A. A. BONDI. 502 pages, Wiley, New York, 1968, $18.50.

This book develops a methodology enabling chemists and chemical engineers to relate certain physical properties of condensed phases to molecular structure. The states of matter treated are molecular crystals, liquids, and glasses. The physical properties covered are *P-V-T* and related thermal properties, and certain transport properties. Energy of vaporization, van der Waals dimensions, molar refractivity, dipole moment data, and dielectric loss are used, but not discussed thoroughly. Tables 14.1 to 14.16 contain the requisite molecular structure increments. Background material presented is a guide to the literature.

These documents have been reviewed by the Editorial Board of the National Bureau of Standards.