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Book Review

Handbook of Heats of Mixing, Supplementary Volume, by James J. Christensen, Richard L. Rowley and Reed M. Izatt, John Wiley and Sons, Ltd., New York, 1988, XIII + 1145 pp. price $130.00.

The first reaction on receiving this massive volume is if this is the supplementary volume what must be original have looked like. Well to set minds at ease on this point let's state at once that the initial Handbook of Heats of Mixing was published in 1982 by John Wiley and Sons and summarized the published literature values through 1980 for the mixing of liquids. This supplementary volume details enthalpy changes for mixing (ΔH) of pure liquids and gases at constant temperature and pressure and updates the data from 1981–1986. The book is divided into two parts, section one dealing with the use and prediction of heats of mixing. Section two lists heat-of-mixing data; before progressing further with this review, a little physical chemistry is necessary. The change in enthalpy when two pure liquids are mixed is called the heat of mixing in the compilation of data, but heat of mixing and excess enthalpy (h^E) are terms used in the sections dealing with the use and prediction sections. Section one, after a brief introduction, goes on to discuss the uses of heats of mixing, dealing with the basic concepts in using heats of mixing, the calculation of other excess properties (excess heat capacity and excess free energy), phase behavior determinations, the calculation of partial molal enthalpies, the consistency test for activity coefficients and the temperature dependence of activity coefficients. Grouped under the general heading of the prediction of excess enthalpy is a discussion of basic concepts for the development of predictive methods which are then discussed in some detail under the headings Group Contribution Methods, Equation of State Methods, Volumetric Methods and the Prediction of Ternary Heats of Mixing. With a list of references and a section on computer programs this takes up 112 pages. Section two listing the heat of mixing data goes on for just on another 1000 pages. It comprises a discussion on how to use the tables and indexes followed by the compiled data and finishes up with several indexes designed to allow the reader to find the information he wants. The empirical formula index contains the empirical formula of each material indicating the location of the data in this section of the book. The reference index includes a year-by-year alphabetical listing of all the cited references. The synonym index is really an alphabetical listing of the various names of the materials which occur in the tabulations. A third index lists the materials in the table according to the form, magnitude and sign of ΔH. The final index is labelled ternary and quaternary

systems. This is a monumental work and the information contained is well documented.

One more point needs to be made. A computer diskette is included with the manual for use with IBM compatible machines, and a commentary on the contents of the diskette occurs in pages 108–112.

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