and will gain an appreciation of how much we have learned in a relatively short period about living creatures from the study of their proteins. Emil Smith can proudly stack the volume next to the six enormous editions of *The Principles of Biochemistry* that he helped issue over the years.

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Aqueous Solutions

Ionic Liquids. Papers from a conference, Oxford, England, July 1978. DOUGLAS INMAN and DAVID G. LOVERING, Eds. Plenum, New York, 1981. x, 450 pp., illus. $49.50.

This book of papers on highly concentrated aqueous solutions and molten salts covers experimental data on spectroscopic, transport, and thermodynamic properties; computer simulations; alternative macroscopic properties; applications to industrial electrochemistry; acid-base phenomena; and purification of materials.

In the last 60 years, following the development of the Debye-Hückel theory, the study of electrolytes has primarily been devoted to dilute aqueous solutions. Only in the last 20 years has there been a resurgence of interest in concentrated solutions. The subject is of interest to the geosciences community because of its increasing applications to the understanding of oil and ore formation and of hydrothermal and diagenetic processes.

Industrial applications mostly involve solutions or molten salt systems that are outside the region of validity of most microscopic theories. Consequently, much of the description of such systems is macroscopic or semi-empirical. Clearly much more experimental work needs to be done to aid future theoretical development. Many of the papers in the book describe the connections and analogies between concentrated aqueous solutions and molten salts. These connections and analogies will be the path of theoretical development over the next few years, and numerous new and old ideas are suggested for consideration by the various authors.

One that is of interest is the use of computer simulations (molecular dynamics) to explore the impact of various potentials and to isolate the most significant theoretical factors (Adams and Hills). However, it will be some time before real systems will be accurately modeled. Another example is the comparison of a given macroscopic transport property for concentrated solutions, molten salts, and even ionic solids (Richter) to exploit or verify the prediction abilities of the various models such as free volume, lattice, and configurational entropy. Such comparisons are best made by using general macroscopic formulations like the Onsager l_{ij} or R_{ij} of irreversible thermodynamics or velocity correlation coefficients (Richter; Spiro and King). A third example is the empirical correlation between optical basicity parameters from absorption spectra and acid strength (Duffy and Ingram), although complex ion formation (for example, in $ZnCl_2$) does not seem to have been considered. A last example is the interesting linear correlations over quite substantial concentration ranges of charge-transfer-to-solvent spectral shifts with activity coefficients and with lattice-model Madelung constants (Griffiths and Wijayanayake).

Although the papers vary in quality and generality, overall the book is a rather nice survey of a field of growing importance and contains enough interesting and controversial ideas to be worth perusing.

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