

# Properties Aqueous Solutions

Thermodynamic Properties of Aqueous Solutions of Organic Substances discusses the structure of aqueous solutions of organic substances and the intermolecular reactions in them, presenting experimental data, modern concepts concerning the properties of these solutions, and the results of computer simulation. The book offers an in-depth study of the properties of maximally dilute aqueous solutions of polar and nonpolar organic molecules as well as the specific enthalpies of mixing. The Addendum contains experimental data on the thermodynamic properties of infinitely dilute solutions. Properties of Aqueous Solutions of Electrolytes is a handbook that systematizes the information on physico-chemical parameters of multicomponent aqueous electrolyte solutions. This important data collection will be invaluable for developing new methods for more efficient chemical technologies, choosing optimal solutions for more effective methods of using raw materials and energy resources, and other such activities. This edition, the first available in English, has been substantially revised and augmented. Many new tables have been added because of a significantly larger list of electrolytes and their properties (electrical conductivity, boiling and freezing points, pressure of saturated vapors, activity and diffusion coefficients). The book is divided into two sections. The first section provides tables that list the properties of binary aqueous solutions of electrolytes, while the second section deals with the methods for calculating their properties in

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multicomponent systems. All values are given in PSI units or fractional and multiple units. Metrological characteristics of the experimental methods used for the determination of physico-chemical parameters are indicated as a relative error and those of the computational methods as a relative error or a root-mean square deviation.

This Volume, the last of the series, is devoted to water in its metastable forms, especially at sub-zero temperatures. The past few years have witnessed an increasing interest in supercooled water and amorphous ice. If the properties of liquid water in the normal temperature range are already eccentric, then they become exceedingly so below the normal freezing point, in the metastable temperature range. Water can be supercooled to  $-39^{\circ}\text{C}$  without too much effort, and most of its physical properties show a remarkable temperature dependence under these conditions. Although adequate explanations are still lacking, the time has come to review available knowledge. The study of amorphous ice, that is, the solid formed when water vapor is condensed on a very cold surface, is of longer standing. It has achieved renewed interest because it may serve as a model for the liquid state. There is currently a debate whether or not a close structural relationship exists between amorphous ice and supercooled water. The nucleation and growth of ice in supercooled water and aqueous solutions is also still one of those grey areas of research, although these topics have received considerable attention from chemists and physicists over the past two decades. Even now, the

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relationships between degree of supercooling, nucleation kinetics, crystal growth kinetics, cooling rate and solute concentration are somewhat obscure. Nevertheless, at the empirical level much progress has been made, because these topics are of considerable importance to biologists, technologists, atmospheric physicists and glaciologists.

The aim of this book is to explain the unusual properties of both pure liquid water and simple aqueous solutions, in terms of the properties of single molecules and interactions among small numbers of water molecules. It is mostly the result of the author's own research spanning over 40 years in the field of aqueous solutions. An understanding of the properties of liquid water is a prelude to the understanding of the role of water in biological systems and for the evolution of life. The book is targeted at anyone who is interested in the outstanding properties of water and its role in biological systems. It is addressed to both students and researchers in chemistry, physics and biology.

This inexpensive qualitative analysis supplement offers maximum flexibility and can accompany general chemistry texts. Works well with any general chemistry text, where the instructor wants more qualitative analysis in conjunction with regular class work.

This book provides a thorough discussion of the thermodynamics of aqueous solutions and presents tools for analyzing and solving scientific and practical problems arising in this area. It also presents

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methods that can be used to deal with ionic and nonionic aqueous solutions under sub- or supercritical conditions. Illustrations and tables give examples of procedures employed to predict thermodynamic quantities of the solutions, and an appendix summarizing statistical mechanical equations used to describe the systems is also provided. High-Temperature Aqueous Solutions: Thermodynamic Properties contains essential information for physical chemists, geochemists, geophysicists, chemical technicians, and scientists involved in electric power generation.

This book forms the proceedings of the 11th International Conference of the Properties of Steam, conducted in 1989 in Czechoslovakia. The session provided an international forum for the dissemination of information on recent progress in experiment, theory and formulation of the properties of steam and aqueous systems in the power industry during the past five years. The papers reflect present knowledge of the thermophysical properties of pure ordinary and heavy water to the properties of aqueous solutions, to the power cycle chemistry, to corrosion in power plants.

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