

Introduction

The edition is a continuation of a series of works of this author that are devoted to many-years' theoretical studies of the structure of, and interparticle interactions in, aqueous solutions of electrolytes, programmed and factographic representation of experimental data, and recommendations related to the methods of calculating physicochemical parameters of binary and multicomponent systems [1–24].

In this edition, information on the vapor pressures over solutions, activities of water, and osmotic coefficients over electrolyte solutions is substantially remade in comparison with [19, 21], and new experimental data are given. Coefficients for calculating vapor pressures over solutions of a large number of electrolytes that were obtained by mathematical treatment (using methods of regression analysis) of experimental data available in the literature are presented. Experimental data for most widely applied electrolytes are given for a high-temperature range.

In Part I, methods for calculating vapor pressures over solutions, activities of water, osmotic coefficients, and boiling and freezing temperatures of multicomponent solutions of electrolytes are given; related equations for calculating water vapor pressures over pure water are considered.

In Part II, the list of electrolytes for which vapor pressures, activities of water, and osmotic coefficients over solutions were calculated is extended in comparison with [21] (see List of tables to Part II); the existing tables were remade. In this issue, as in [21], a logical mode of representing reference data was retained; for each electrolyte, the maximum temperature range and the maximum range of concentrations are given. A large attention is paid to high-temperature researches. For many electrolytes, additional original experimental investigations were carried out. The author hopes that all these changes will favor the readability and applicability of the material presented.

In this edition, the following system of references is used. For each property and each electrolyte, the full bibliography is given (although many data were refined by our own experimental studies, and it is by no means always that information from the references mentioned has been mathematically processed); in those cases where no references are given, this means that original data of this author were used.

The author will be very grateful to readers for any remarks and wishes.