

Foreword

This book is the continuation of a number of the author's works dealing with study, representation, and methods of calculation of the physicochemical properties of binary and multicomponent electrolyte solutions [1–5].

Compared to [3], this book contains substantially revised and enlarged data on thermal conductivity, new experimental data on the surface tension of electrolyte solutions, and coefficients for calculation of the thermal conductivity and vapor pressure over a solution for many electrolytes. The coefficients are obtained as a result of mathematical processing of available experimental data by the methods of regression analysis. Experimental data for the most widely used electrolytes are given for high temperatures and pressure ranges.

Section I gives the methods for calculation of thermal conductivity and various coefficients for a wide range of electrolytes, which allow one to calculate multicomponent solutions with high accuracy. New regression equations for calculation of the thermal conductivity of water in the range 0–350°C, which are necessary for determination of the thermal conductivity of solutions, are proposed. An equation for calculation of the surface tension of binary and multicomponent systems, based on data on the water activity, is also presented. Approximation expressions for calculation of the vapor pressure over pure water and a solution, which are used to find the water activity, are also given.

The list of electrolytes in Section II is significantly longer than in [3] (see table index for Section II), and the data for the same electrolytes were revised. The logic sequence of reference data is identical to that in [3], and the maximum temperature range and mass content in a solution are given for each electrolyte. Considerable attention is given to high-temperature studies. Experimental data for many electrolytes were additionally obtained by the author, using original experimental techniques, which should make this book popular.

The following system of references is used in [1–3] and the next books [4, 5]. The complete references are given for each property and each electrolyte, and the absence of references means that original data are presented. Many data were refined by the author's experimental studies, and not all data from the references were mathematically processed.

The author will gratefully accept all comments and wishes of the reader.