Data Article

Data on primary hydration characteristics of aqueous electrolytes

Jyoti Sahu, Vinay A. Juvekar *

Department of Chemical Engineering, Indian Institute of Technology Bombay, Powai, Mumbai 400076, India

A R T I C L E   I N F O

A B S T R A C T

The data presented in this article support the research article entitled "Development of a rationale for decoupling osmotic coefficient of electrolytes into electrostatic and nonelectrostatic contributions" (Sahu and Juvekar, 2018) [1]. In this article, we have presented the plots of osmotic coefficients against molality for more than hundred aqueous single electrolytes at 25 °C. The linear regions in these plots are marked to show that they are present in all these electrolytes and that these regions extend over a wide range of concentrations. Slopes of the linear regions are used to estimate the primary molar hydration volume as well as the primary hydration number of these electrolytes. These values are also listed and the method of estimation is presented with sample calculation. These data, not only reinforce the observations made in the main article but also provide useful measures for estimation of the nonelectrostatic contribution to the osmotic coefficient.

* Corresponding author.
  E-mail addresses: jsahu1986@gmail.com (J. Sahu), vaj@iitb.ac.in (V.A. Juvekar).

Specifications Table

Subject area	*Electrochemistry.*
More specific subject area	*Thermodynamics of electrolytes.*
Type of data	*Plots and Tables*
How data was acquired	*From the analysis of data obtained from published literature*
Data format	*Analyzed*
Experimental factors	*Not Applicable*
Experimental features	*Not Applicable*
Data source location	*Not Applicable*
Data accessibility	*Data are available in this article*
Related research article	*J. Sahu, V.A. Juvekar, Development of a rationale for decoupling osmotic coefficient of electrolytes into electrostatic and nonelectrostatic contributions. Fluid Phase Equilibria 2018, 460: 57-68.*

Value of the data

- The linear regions in the osmotic coefficient-molality plots of several aqueous solutions of single electrolytes have been marked. The existence of these linear regions provides supportive evidence to the analysis presented in the main paper [1].
- The primary molar hydration volumes and primary hydration numbers obtained in this article would be useful for estimation of nonelectrostatic contribution to the osmotic coefficient of aqueous solutions of single and mixed electrolytes using the procedure described in Ref. [1].
- These data would also allow estimation of electrostatic contribution to the osmotic coefficient of aqueous solutions of electrolytes using the procedure described in Ref. [1].

1. Data

The data are provided in two parts. Part-1 contains plots of osmotic coefficient versus molarity of solutions of single electrolytes. The linear regions are marked on the plots. Slopes of these linear regions are listed below the plots. Part-2 lists the data of the primary molar hydration volume and primary hydration numbers.

Part-1: Plots of Osmotic coefficient-molality data for single aqueous electrolytes.

a. 1-1 electrolytes (data of osmotic coefficient from Ref. [2]).