

THE IONIC ACTIVITY COEFFICIENTS OF ELECTROLYTES IN AQUEOUS SOLUTIONS USING SELECTIVE ELECTRODES AND CRYOSCOPIC DATA

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Potentiometry has been an essential tool for experimental studies of electrolytes since the earliest quantitative work in the field [1]. As direct measures of salt chemical potential, potentiometric data have provided an ideal complement to other methods, but also on the validity of the thermodynamic relations used to calculate salt activity from water activity.

Differential cryometric method utilized for obtaining experimental data has permitted the measurement of cryometric effect with a precision of $\pm 2 \times 10^{-4}$ degrees [2].

This paper presents the results obtained for ion activity coefficients for K^+ ion in binary system: $KCl - H_2O$, $KNO_3 - H_2O$, $K_2SO_4 - H_2O$ ascertain through potential measurements with K^+ selective ion electrode and also using the cryometric data. Authors achieve a detailed debate concerning the theoretical reckoning of potential in the electrical cell used and the method to make standard curves are experimentally obtained.

This work presents to the results obtained for the activity coefficients of the potassium in the same aqueous solutions of electrolytes as well as the coefficients of the mixed activity electrolytes in connection with the ternary system, determined by a differential cryoscopy method.

In the case of binary solutions, the values of average ionic activity coefficients have been recalculated from the freezing points at standard temperature so they can be compared to the literature data, existing only at standard temperature.

It shows the results' accuracy which are comparable with data calculated by Pitzer's model [3] and with experimental data obtained for K^+ ion from cryoscopic measurements.

Keywords: ionic thermodynamic activity coefficients, cryometric data, freezing points, electrolytes solutions, potentiometric data, selective ion electrode.

References

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