The Thermal Conductivity of Aqueous Solutions of $Yb(NO_3)_3 \cdot 5H_2O$ in the Wide Range of the Parameter of State

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The thermal conductivity λ of aqueous solutions of $Yb(NO_3)_3 \cdot 5H_2O$ at various compositions was measured by the absolute technique of coaxial cylinders in the range of temperature 20-200°C at pressure 0.1-100 MPa. In the calculation equation we introduced corrections conditioned by the placement of the differential thermocouple and the correction taking into account nonsealment of the inner cylinder surface temperature field. The error of individual measurements did not exceed ±1.3%.

The measurements of the solutions were carried out on isotherms with the step in pressure of 20 MPa. The analysis of various cross-sections of λ-T-P-C of the investigated electrolyte solutions shows that with the increase of salt concentration of the solution, λ is decreasing. The experimental data are being discussed from the point of view of structure and peculiarities of intermolecular interaction in aqueous solutions. Dependence of the thermal conductivity on pressure is represented in the form of Tate's equation.