

SECTION 1 CONTEMPORARY ISSUES OF THEORETICAL AND EXPERIMENTAL CHEMISTRY

THERMODYNAMIC FUNCTIONS OF THE FORMATION OF Nd (III) COMPLEXES WITH 2-HYDROXYBENZOYL-HYDRAZIDE IN AQUEOUS-ETHANOL MEDIUM

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The modern development of coordination chemistry is characterized by the intensive use of complex metal compounds with organic reagents to separate, concentrate and quantify various elements. The results of a study of the complexation of 2-hydroxybenzoylhydrazide with neodymium (III) ions in an aqueous-ethanol medium at different temperatures (298-318 K) are presented in this paper. A pH-metric study of the 2-hydroxybenzoylhydrazide-neodymium (III) ions system in an aqueous-organic medium: water-ethanol (ratio 10:90, 30:70, 50:50, 70:30, 90:10) has been carried out. From the data on the change in Gibbs energy, enthalpy, entropy, it follows that for the 90:10, 10:90 ratios, complexation with an organic ligand is difficult due to the high solvating ability of water with respect to metal ions, as well as the solvation of the ligand by ethanol molecules. However, at aqueous-ethanol ratios of 50:50 and 70:30, the bonding of metal ions to the ligand is strengthened. It was found that the decrease in the complexing ability is observed in the series of aqueous-ethanol ratios of 10:90, 30:70, 50:50, 70:30, 90:10. The ligand forms donor-acceptor complexes with neodymium (III) ions, and water molecules form complexes with ionic bonds [1]. Thus, as a result of the studies, the thermodynamic characteristics of the formation of nitrogen-containing ligand complexes with Nd (III) ions were calculated. It is shown that the replacement of water by an organic solvent is accompanied by an increase in the covalence ratio of the metal-oxygen bond, which is reflected in the complexing capacity of the ligand.

References:

1. IGNATYEVA, K.A. and DEVYATOE, F.V. 2007. Solvation and complexation in the dysprosium (III) system L-histidine-water-acetonitrile (0-72 vol.%). *Bulletin of the Kazan Technological University*, **2**, pp.22 - 25.