

# Thermodynamic Studies of Complex Formation Between 18-Crown-6 (18C6) With $\text{La}^{3+}$ , $\text{Ce}^{3+}$ , $\text{Pr}^{3+}$ and $\text{Nd}^{3+}$ Cations In Some Pure and Binary Mixed Solvent Systems

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## ABSTRACT:

In the present work we have studied the complexation reactions of 18-crown-6 (18C6) with  $\text{La}^{3+}$ ,  $\text{Ce}^{3+}$ ,  $\text{Pr}^{3+}$  and  $\text{Nd}^{3+}$  cations in pure acetonitrile (AN), pure water ( $\text{H}_2\text{O}$ ) and acetonitrile - water (AN- $\text{H}_2\text{O}$ ) binary solvent mixtures at different temperatures by the conductometric method. The stability constants of the resulting 1:1 complexes were determined from computer fitting of the conductance versus mole ratio data. The values of stability constants of complexes, which were obtained from conductometric data, show that the stability of complexes is affected by the nature and composition of the binary mixed solvents. The corresponding thermodynamic parameters ( $\Delta H^0$ ,  $\Delta S^0$  and  $\Delta G^0$ ) were obtained from the temperature dependence of the stability constants using van't Hoff plots. The results show that the values and also the sign of these parameters are influenced by the nature and composition of the mixed solvents.