Thermodynamic Studies of Complexes of Amlodipine Besylate with Ni^{2+}, Mg^{2+}, Co^{2+} and Ca^{2+} cations in pure and in mixed binary solvent systems at 303.15, 313.15 and 323.15 K by Conductometric Method

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Abstract : The present work relates to the complexation reaction between Amlodipine Besylate[AML] with Ni^{2+}, Mg^{2+}, Co^{2+} and Ca^{2+} cation in dimethylsulfoxide (DMSO), pure methanol (MeOH) and their binary mixtures(DMSO-MeOH and DMSO-Water) by conductometric method. The conductance data show that the stoichiometry of the complexes formed between AML with Ni^{2+}, Mg^{2+}, Co^{2+} and Ca^{2+} cation in pure DMSO, pure MeOHas well as in the binary solvent mixtures was 1:1. The stability of AML complexes with Ni^{2+}, Mg^{2+}, Co^{2+} and Ca^{2+} metal ion was observed to be sensitive to the nature of the solvent system. In case of DMSO-Water binary solvent systems there was a linear change in $LogK_f$ values but in case of DMSO-MeOH binary solvent systems non linear change in $LogK_f$ values observed.The negative values of ΔG^0 show that the reaction is spontaneous and ability of the AML ligand to form stable complexes. However, the result shows positive value of ΔH^0 which indicates that enthalpy is not driving force for the formation of the complexes. Furthermore, the positive value of ΔS^0 indicates that entropy is a driving force for the complexation. The values of ΔH^0 and ΔS^0 for formation of the complexes were obtained from temperature dependence of the stability constants.

Keywords : Complexes, Conductance, Formation constants, Thermodynamics, Amlodipine Besylate.

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