

## Partial Molar Properties of Aqueous Solution of Alcohols at 298.15 K

T. Kimura<sup>C, S</sup>, Shinya Inui and T. Kamiyama

*Department of Chemistry, Kinki University, Kowakae, Higashi-osaka, Japan*  
*kimura@chem.kindai.ac.jp*

In order to investigate correlations between molecular structure of solutes and physicochemical properties of solution, it is very important to know the molecular interaction in the solution to the concentration domain where a solute-solvent molecule interaction appears from the concentration near infinite dilution. Amphiphilic solvents of aliphatic alcohols and alkoxyalcohols have the hydrophilic group and the hydrophobic group in the molecule. The intermolecular interactions of the aliphatic alcohols and alkoxyalcohols in water have the hydrophilic hydration terms and the hydrophobic hydration terms. To clarify the correlation between thermodynamic properties of such mixtures and molecular structure of their size of aliphatic groups, excess partial enthalpies of water of water amphiphilic solvents(2-methoxyethanol, 2-ethoxyethanol, 2-propoxyethanol, 2-iso-propoxyethanol, 2-butoxyethanol, 2-iso-butoxyethanol, 2-tert-butoxyethanol, ethylene glycol, ethanol, propanol and butanol) were determined at 298.15 K. Also the activity coefficients of water of aqueous solution of amphiphilic solvents were also determined by means of vapor pressure osmometry. Excess partial enthalpies and excess chemical potential of water of aqueous solution of amphiphilic solutes(aliphatic alcohols and alkoxyalcohols) were very small from  $x = 0.00001$  to  $0.007$ . All partial molar enthalpies of water in aqueous solution were exothermic heat from  $0.05$  to  $1$  mJ. Those waters were stabilized in aqueous solution of amphiphilic solutes. Excess chemical potential of water of aqueous solution of amphiphilic solutes were positive for all compounds. Excess partial molar entropies of water of aqueous solution of amphiphilic solutes were determined from excess chemical potentials and excess partial molar enthalpies of water of those systems, and the interaction of hydrophobic hydration will be discussed