OP-10

THERMODYNAMIC INTERPRETATION OF ADSORPTION OF SOME BENZENETRICARBOXYLIC AND DIHYDROXYBENZOIC ACIDS AT THE α-ALUMINA/ELECTROLYTE INTERFACE

Jayanta M. Borah and Sekh Mahiuddin*

Materials Science Division, North-East Institute of Science and Technology, (Formerly Regional Research Laboratory), CSIR, Jorhat-785 006, Assam
E- mail: mahirrljt@yahoo.com

The feasibility of adsorption of a surface-active agent at the metal oxide/water interface can be predicted from the numerical values of thermodynamic parameters. The adsorption of benzenetricarboxylic and dihydroxybenzoic acids at the α-alumina/water interface as functions of time, temperature and acid concentration is reported. The activation energy, E, for adsorption of these acids onto α-alumina surfaces were calculated by using Arrhenius equation, $k=Ae^{-E/RT}$; k is the rate constant, T the temperature in Kelvin and R the gas constant. The Gibbs free energy for adsorption, ΔG, was estimated from the adsorption co-efficient, a parameter of the Langmuir adsorption equation, $\Gamma = \Gamma_{max} Ce/(K + Ce)$, where $K = 1/K_s$, K_s is the adsorption co-efficient, and Γ_{max} are the

adsorption density of adsorbate in μmol m^{-2} at equilibrium and after saturation of α-alumina surfaces and *Ce is* the concentrations of adsorbate at equilibrium. ΔH was calculated from the van't Hoff equation for adsorption and ΔS from the relation, $\Delta G = \Delta H - T\Delta S$. The activation energies for the trimesic acid/α-alumina, hemimellitic acid/α-alumina and 3,4-dihydroxybenzoicacid/α-alumina systems were found to be negative. For other two systems, trimellitic acid/α-alumina and 2,3- dihydroxybenzoic acid/α-alumina the activation energies are positive. For all systems ΔG is negative and ΔS is positive. The results imply that the adsorption for all these systems is spontaneous in nature. Negative activation energy indicates that the adsorption is more facile and due to available thermal energy to overcome the energy barrier.

OP-11

PARTIAL MOLAR THEMRMODYNAMIC PROPERTIES OF CYCLOHEXANE + 1-ALCOHOLS + BRANCHED ALCOHOLS AND STRUCTURE BREAKING EFFECTS

Nilesh Vaghela, Sunil R Patel, Saurabh S Soni and*

Nandhibatla V Sastry

Department of Chemistry, Sardar Patel University, Vallabh Vidyanagar 388120, Gujarat