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Micellization of Cetylpyridinium Chloride in Aqueous Lithium Chloride, Sodium Chloride and Potassium Chloride Media

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Abstract — Surface tension and electrical conductance of cetylpyridinium chloride (CPC) in water were measured in the presence of lithium chloride, sodium chloride and potassium chloride at 295, 298 and 303 K. From these experimental data, critical micelle concentration, surface density, counter-ion binding constant and standard free energy of micellization of CPC were determined and no effect of co-ion on these parameters is found. Critical micelle concentration has a minimum around 298 K. Surface density of CPC at the air – water interface increased by the addition of electrolyte. The surface area per molecule of CPC at the air – water interface is about 63 % more compared to that of sodium dodecyl sulfate molecule and hence the pyridine ring of the adsorbed CPC molecule appears to reside at the interface. Aggregation numbers of CPC were estimated from the electrical conductance data by applying the mixed electrolyte model. In the presence of more than 5.2×10^{-4} mol kg⁻¹ NaCl, aggregation number of CPC is found to be higher than that in the presence of LiCl and KCl thereby indicating the possibility of co-ion effect on the aggregation number.