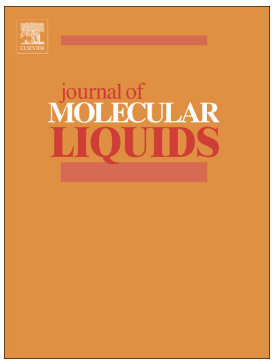

Interaction of cationic surfactant cetyltrimethylammonium bromide (CTAB) with hydrophilic ionic liquid 1'butyl'3'methylimidazolium chloride [C4mim][Cl] at different temperatures – Conductometric and FT-IR spectroscopic study

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Interaction of cationic surfactant cetyltrimethylammonium bromide (CTAB) with hydrophilic ionic liquid 1-butyl-3-methylimidazolium chloride [C_4mim][Cl] at different temperatures – Conductometric and FT-IR spectroscopic study

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ABSTRACT

This paper delineates the effect of hydrophilic ionic liquid 1-butyl-3-methylimidazolium chloride on micellar behavior of cationic surfactant cetyltrimethylammonium bromide (CTAB). Significant physicochemicalproperties like conductance, critical micelle concentration are detected to change as [C_4mim][Cl] is added to aqueous CTAB. The conductivitydata of surfactant CTAB in aqueoussolutions of ionic liquid were experimentally determined in the temperature range from 298.15 to 308.15 K with the interval of 5 K. Obtained experimental data of conductivity have been utilized to deduce the critical micelle concentration (CMC). Using temperature dependence of CMC secured from conductivity measurements numerous thermodynamic parameters of micellization namely standard enthalpy of micellization (ΔH_m^0), standard free energy of micellization (ΔG_m^0), and standard entropy of micellization (ΔS_m^0) have been evaluated. FT-IR Spectra recorded for individual IL and some selected concentration to analyze the structural changes prevailed in the system. Results have been discussed in terms of effect of hydrophilic ionic liquid 1-butyl-3-methylimidazolium Chloride [C_4mim][Cl] on the micellization process of the surfactant cetyltrimethylammonium bromide (CTAB).

Keywords: Ionic liquid, Cetyltrimethylammonium bromide (CTAB), FT-IR, Thermodynamic property, Micellization, CMC.

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