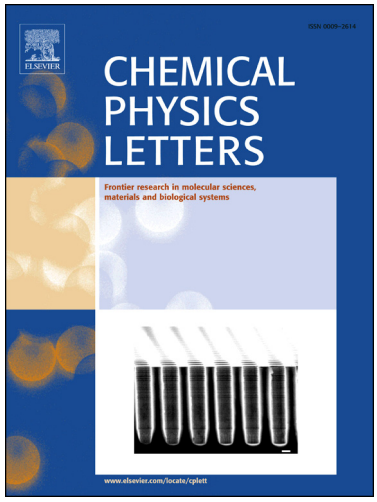

Research paper

Interaction between amphiphilic ionic liquid 1-butyl-3-methylimidazolium octyl sulfate and anionic polymer of sodium polystyrene sulfonate in aqueous medium

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Interaction between amphiphilic ionic liquid 1-butyl-3-methylimidazolium octyl sulfate and anionic polymer of sodium polystyrene sulfonate in aqueous medium

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Abstract:

The micellization of an aqueous solution of the surface active ionic liquid (SAIL), 1-butyl-3-methylimidazolium octylsufate (C_4mim) (C_8OSO_3) and its interaction with an anionic polymer sodium polystyrene sulfonate, (NaPSS) were studied using conductimetry, tensiometry and fluorimetry. Surface tension profile shows a more dramatic increase in the value of surface tension of aqueous (C_4mim) (C_8OSO_3) before the critical micelle concentration (cmc) of IL. By using conductivity measurements, we have calculated the critical micellization concentration (*cmc*), the standard Gibb's free energy ΔG_m^0, the standard enthalpy change ΔH_m^0, and standard entropy change ΔS_m^o of micellization of aqueous solution of IL Behaviour of fluorescence probe confirms the binding interactions between SAIL and the polyelectrolyte.

Keywords: 1-Butyl-3-methylimidazolium octylsulfate; Sodium polystyrene sulfonate; Surface tension; Fluorescence probe; Polyelectrolyte / IL complex.

1. Introduction:

Because of their distinct properties, Room temperature ionic liquids (RTILs) as a new solvents used in chemical processes and have been the target of many scientific investigations [1-8]. ILs have been described as having advantageous properties over the "traditional" molecular solvents like large electrochemical window ,high thermal stability, high ionic conductivity and inflammability [9-11]. These have been utilized in a variety of application such as catalysis, organic synthesis, extraction, electrochemical processes and separation technology [12-17]. ILs interact with polymers in aqueous solutions to generate systems with many industrial, pharmaceutical and technological applications like, foods [18], pharmaceutical [19] and nanotechnology [20]. Therefore, the study of the effect of ILs on aqueous systems comprising polymers is very broad. Among the of IL structure, those containing imidazolium cations have received enormous attention as co-solvants in systems containing amphiphilic molecules [21-26]. Skerjank et *al.* studied the interaction between alkyltrimethylammonium bromides (C_nTMAB) and polystyrene sulfonate sodium (NaPSS). They