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Morphological transitions in aqueous surface active ionic liquid influenced by additives investigated through SANS

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Designing microscopic interactions judiciously in the amphiphilic systems with added additives is advantageous in order to design various morphologies. Apart from the biological relevance, ease of formation, and long-term stability, catanionic systems could form various morphologies including vesicles, which are the best alternatives to liposomes and niosomes and are potentially the best ever cavity to carry the drug molecules within its cage/bilayer. In a quest for the best catanionic system to sequester functional molecules, herein we have investigated the concentration/composition induced morphological transitions in the catanionic systems comprising of surface-active ionic liquids (SAILs) and various inorganic and organic electrolytes. The variables studied for the phase transition and the shape and size of the aggregates includes; alkyl chain length and head group structures of the SAILs and the concentration and structure of the additives. We used various spectroscopic, microscopic and scattering techniques to determine the size and shape of the aggregates including SANS. The micelle to vesicle transition through added additive is investigated by SANS. The size of micelle, vesicle and bilayer thickness of vesicle is also determined through SANS. For the first time, we used fluorescence resonance energy transfer (FRET) to determine the size of the aggregates and prove the significance of this technique by correlating data with SANS data. This work could be of interest in the field of drug delivery as the possible new age nanocarriers.

Speakers Gender

Female

Level of Expertise

Do you wish to take part in the poster slam

Yes

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