

Studies on the Effect of Anionic Surfactant on the Microemulsion System Containing [60]fullerene

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Abstract

Fullerenes have potential applications in the form of microemulsion systems. Microemulsion studies with various alcohols as co-surfactants reveals that as the co-surfactant was changed from propanol to octanol, the water quantity in the microemulsion was less when [60]fullerene was present in the oil. The microemulsion region increases when [60]fullerene is present along with co-surfactants like propanol, butanol and pentanol and decreases when hexanol and octanol were present. The thermodynamic properties (ΔG° , ΔH° and ΔS°) of reverse micellisation of SDS in toluene-[60]fullerene solution at 30°C and 40°C were calculated and the results show that though there is no significant change in the overall ΔG° , there was significant decrease in the enthalpic interactions with a corresponding increase in the entropy for reverse micellization in toluene. The values of ΔG° , ΔH° and ΔS° are negative indicating the spontaneous and exothermic formation of a reverse micelle.

Keywords: Anionic Surfactant, Critical Reverse Micelle Concentration, [60]fullerene, Pseudo Ternary Phase Diagram