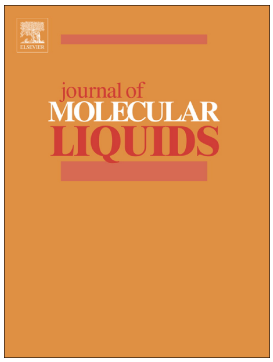

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Supramolecular assemblies involving calix[4]resorcinol and surfactant with pH-induced morphology transition for drug encapsulation

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The present investigations concern the mixed aggregation of anionic surfactant sodium dodecyl sulfate (SDS) and aminomethylated calix[4]resorcinol (ACR) with ethylsulfonate groups on the lower rim. The interaction between these compounds was investigated by DOSY NMR, tensiometry, conductometry, dynamic and electrophoretic light scattering, atomic force microscopy and drug solubilization. The mixed supramolecular systems based on ACR and SDS can be derived due to pH-switchable properties. Supramolecular assembly took place in acidic medium which caused protonation of the amine groups of ACR and thereby the interaction of charged species in solution. Remarkably, the globular SDS micelles were observed to transform into rod-like micelles in the presence of ACR at lower pH, which can be used to encapsulate the hydrophobic guest molecules.

Keywords: Supramolecular chemistry; Self-assembly; Surfactants; Calixarenes; Drugs; Solubilization.

1. Introduction

Quite a number of studies have been dedicated to understanding the interactions of various macrocycles with surfactants, and how these interactions influence on their specific functions [1-6]. These physicochemical studies have aided in the supramolecular design of potential nanocontainers for different drugs of low water-solubility [5,6]. Surfactants are known for their ability to form self-assembled aggregates that used for solubilization of these drugs in aqueous solution [7]. The calixarene structure has a spectrum of binding sites with different

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