

SURFACTANT BEHAVIOUR OF NOVEL CARBOHYDRATE LIQUID CRYSTALS

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Abstract

The study of liquid crystalline behavior of new amphiphilic carbohydrate derived liquid crystals has gained world-wide interest since these glycolipids have technical and biological applications in a wide area such as thermotropic and lyotropic liquid crystals, surfactants, lubricants, solubilization and crystallization of membrane enzymes etc. Glycolipids are natural surfactants based on a hydrophilic sugar (carbohydrate) part and a hydrophobic hydrocarbon domain. In this paper, surfactant behavior of five novel glycolipids is presented based on their Critical Micelle Concentration (CMC). The nonionic surfactants treated with iodine form donor-acceptor complexes in aqueous medium. Thus the CMC is determined by the spectral absorption and the shift in the absorbance maximum (λ_{max}) of I₂ upon complex formation with surfactant. For a better comparison of results, turbidity measurements are exploited to determine CMC. In accordance with the results of both methods, the CMC of all the acetylated compounds, lie within the typical range for nonionic surfactants; 10^{-5} to 10^{-4} mol dm⁻³. Further, other fundamental parameters of surfactants, such as the HLB values and the cloud points of each compound were also studied.

Keywords: glycolipids, surfactants, critical micelle concentration, hydrophilic lipophilic balance, cloud point

