

Synthesis of a Novel Glycoside to Use as a Liquid Crystalline Material and a Surfactant

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Carbohydrates act as a promising source of liquid crystals due to their amphiphilicity in the form of glycolipids which show many physical, biological and technical properties. They form supramolecular aggregates that collectively exhibit lyotropic mesophases and most of these liquid crystals are non-ionic surfactants. The present work consists of the synthesis of a novel glycoside, 2,3,4,6-tetra-O-acetyl-1-O-3-epiandrosteryl- β -D-glucopyranoside and its deacetylated compound followed by the study of its liquid crystal and surfactant behaviour.

The glycoside was synthesized using glucose as the source material, and its β -configuration was established with spectroscopic data. The thermotropic texture observed is suggested to be Sm A phase and it did not show any lyotropic mesophase behaviour with dichloromethane or chloroform. The DSC thermogram showed a peak at 77°C in the cooling scan indicating the phase transition from isotropic liquid to Sm A phase. The deacetylated product showed thermotropic mosaic like texture at 75°C in the cooling process suggesting Sm B phase. It also showed lyotropic lamellae type texture. The critical micelle concentration (CMC) value of the deacetylated compound lies within the typical CMC range for nonionic surfactants: 10^{-5} – 10^{-4} M. The hydrophilic lipophilic balance (HLB) value suggests that it can be used as a good stabiliser for oil-in-water emulsions.

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