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### **Synthesis of a glycolipid to study the potential ability to stabilize microemulsion systems**

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Microemulsion systems are widely used in the cosmetics and pharmaceutical industries as competitive candidates for drug delivery and controlled *in vitro* releasing of bioactive compounds incorporated in the system. Unstable microemulsion systems can be stabilized using a large variety of additives such as glycolipids, alcohols, surfactants and ionic solids which can perform as co-surfactants, stabilizers etc. In this study, a glycolipid, hexadecyl- $\beta$ -D-glucopyranoside, was synthesized by linking D-glucose to cetyl alcohol *via* acetylated glucoside. The ability of the newly synthesized glycolipid to act as a co-surfactant was tested by introducing it into an emulsion system. The compound, hexadecyl- $\beta$ -D-glucopyranoside, was characterized using nuclear magnetic resonance spectroscopy (NMR) and fourier transform infrared spectroscopy (FTIR). The thermotropic and lyotropic liquid crystal behavior of the glycolipid was studied using an optical polarizing microscope. Both acetylated and deacetylated compounds were found to exhibit thermotropic and lyotropic liquid crystal behaviour.

Emulsions were formulated using olive oil, Span 80 and water at room temperature and 70 °C. The macro emulsion compositions were selected from the ternary phase diagrams constructed at room temperature and 70 °C for the above system. For selected compositions, the conversion of macro emulsions to micro emulsions was observed by optimizing the dosage of the glycolipid, hexadecyl- $\beta$ -D-glucopyranoside. It was observed that at 0.05% (W/W) of glycolipid concentration, the macro emulsion was successfully converted in to a micro emulsion. All the experiments were conducted at 70 °C, repeated three times and the reproducibility of the results was confirmed.

Keywords: Glycolipids, microemulsion, thermotropic, lyotropic, Span 80, olive Oil

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