

Enzyme-catalyzed synthesis and characterization of octyl dihydroxystearate from palm-based dihydroxystearic acid

ABSTRACT

Octyl dihydroxystearate was synthesized enzymatically to overcome the problems associated with chemical processes such as high energy costs and degradation of ester. Immobilized enzyme, Lipozyme IM was employed as catalyst in the esterification reaction between dihydroxystearic acid (DHSA) and 1-octanol. The product obtained was characterized by chromatographic and spectroscopic methods (thin-layer chromatography, gas chromatography, fourier transform infrared, nuclear magnetic resonance spectroscopy) as well as wet chemistry. The crude product has a melting point of 59.0°C, saponification value of 140.5 mgKOH/g, hydroxyl value of 223.9 mgKOH/g and acid value of 7.9 mgKOH/g. The yield was about 95% with respect to the amount of DHSA used. The product obtained was found to contain octyl dihydroxystearate, octyl palmitate and octyl stearate. This compound was found to be nonirritating.

Keyword: Octyl dihydroxystearate; Dihydroxystearic acid; Irritancy; Characterization