

Development, characterization and commercial application of palm based dihydroxystearic acid and its derivatives: an overview

ABSTRACT

Hydroxyl fatty acids and their derivatives are of high value due to their wide range of industrial application, including cosmetic, food, personal care and pharmaceutical products. Realizing the importance of hydroxyl fatty acids, and yet due to the absence of the conventional starting raw materials, Malaysia has developed 9,10-dihydroxystearic acid (9,10-DHSA) and its derivatives from locally abundant palm based oils. The aim of this article is to provide a general description of the works that have thus far being done on palm based 9,10-DHSA: starting from its conception and production from commercial grade palm based crude oleic acid via epoxidation and hydrolysis, purification through solvent crystallization and characterization through wet and analytical chemistry, moving on to developmental works done on producing its derivatives through blending, esterification, amidation and polymerization, and completing with applications of 9,10-DHSA and its derivatives, e.g. DHSA-stearates and DHSA-estolides, in commercial products such as soaps, deodorant sticks and shampoos. This article incorporates some of the patent filed technological knowhow on 9,10-DHSA and its derivatives, and will also point out some of the shortcomings in previously published documents and provide some recommendations for future research works in mitigating these shortcomings.

Keyword: Amidation; Characterization; Commercial application; Crystallization; Dihydroxystearic acid; Epoxidation; Esterification; Polymerization; Ternary blending