Lipase-catalyzed synthesis of palm-based wax esters

ABSTRACT

Wax esters are long chain esters that are derived from long chain fatty acids and long chain alcohols with chain lengths of 12 carbons or more. The compounds have many potential applications. The present work focuses on the synthesis of wax esters by alcoholysis of palm oil with oleyl alcohol using Lipozyme. The effects of various reaction parameters such as reaction time, temperature, amount of enzyme, molar ratio of substrates, various organic solvents and initial water activity (aw) of the reaction system were investigated. The optimum condition to produce wax ester were respectively, incubation time, 5 h-7 h, temperature, 40°C-50°C, amount of enzyme, 1.5% (w/v) and molar ratio of oleyl alcohol to palm oil, 3:1. Hexane was the best solvent for this reaction. Analysis of the yield of the products at optimum condition showed that between 78-83% wax esters were produced.

Keyword: Palm oil; Lipozyme; Enzymatic; Alcoholysis; Wax ester; Oleyl alcohol