

July 23-24, 2018
Rome, Italy

Nurhayati Binti Yusof et al., J Food Nutr Popul Health 2018, Volume 2
DOI: 10.21767/2577-0586-C2-005

TRANS ESTERIFICATION REACTION OF MALTODEXTRIN LAURIC ACID ESTERS USING IMMOBILIZED LIPASE FROM *CANDIDA ANTARCTICA* (NOVOZYME 435)

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This work describes the synthesis of different size maltodextrin (DE 16.5-19.5, DE 13-17, DE 4-7) with vinyl laurate to obtain bio emulsifiers. Immobilized lipase from *C. antarctica* (Novozyme 435) was found a useful biocatalyst for maltodextrin trans-esterification in mixtures of DMSO/ButOH (10/90 v/v) at 60°C for 24 hours. The degree of substitution determined for the optimum conditions and was found in the range of 0.189-0.322. The DS was greater for maltodextrin with the highest molecular weight (DE 4-7) in a vinyl laurate to maltodextrin ratio of 2:1. For large size of maltodextrin (DE 4-7), the lowest amount of vinyl laurate (2:1) were required reflecting the steric hindrance effect of the substrate over lipase. The physicochemical properties of these maltodextrin lauric acid esters were investigated. The produced maltodextrin lauric acid esters were further characterized by Fourier transform infrared spectroscopy (FTIR) and the presence of the lauryl ester group was observed. X-ray diffraction pattern of maltodextrin lauric

acid esters indicated the crystallization of lauric acid side chain. ESI-MS analysis proved the presence of a mixture of esterified products of mono and di-substitutions with lauric acid. All esters did not completely dissolve in water and had a higher viscosity compare to native maltodextrin. However at higher concentration (40% w/w), the esterified maltodextrin exhibited non-Newtonian in contrast to native maltodextrin that exhibited Newtonian behavior.

Biography

N Yusof received her MSc degree in Food Science from University Sultan Zainal Abidin, Malaysia in 2014. The Master's thesis was focused on the development of new prebiotics using cellulase enzyme. Currently, she is a PhD student at the Department of Food and Nutritional Sciences in Reading University. Her PhD project is related to the biotechnological production of novel bio-emulsifiers.

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