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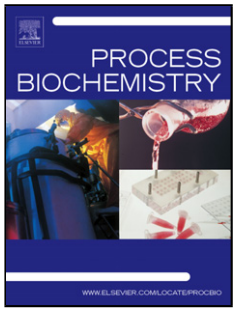

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ACCEPTED MANUSCRIPT

The Performance of Microbial Lipase Immobilized onto Polyolefin Supports for Hydrolysis of High Oleate Sunflower Oil

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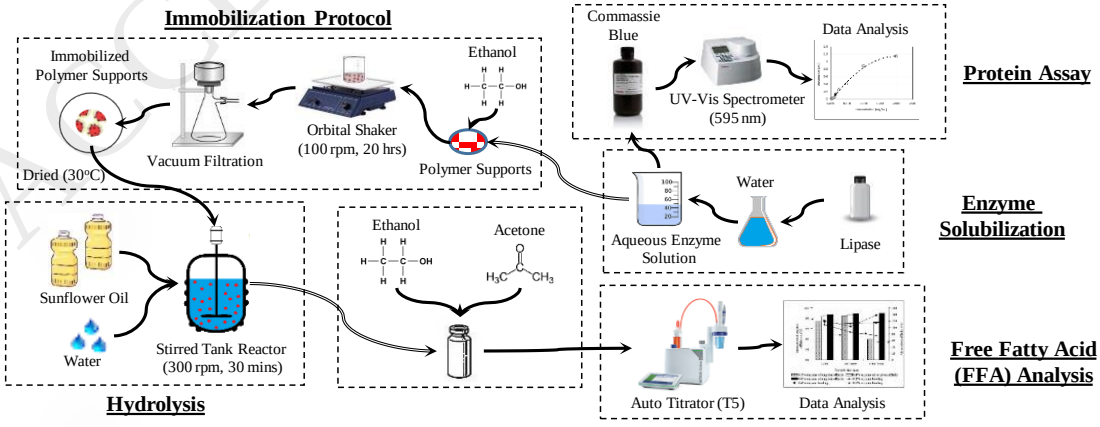
Abstract

The application of an immobilized microbial lipase for the catalytic hydrolysis of tri-glyceride esters into free fatty acids and glycerol is described. High oleate sunflower oil was used as the primary substrate for the hydrolysis conducted in the presence of microbial lipase extracted from the fungal yeast *Candida Rugosa* OF360. The lipase was immobilized on to three different polyolefin supports, high density polypropylene namely (Accurel EG100 and EP100), and low density polyethylene (Accurel EP400) In the case of Accurel EP400 there was a strong positive relationship between enzyme concentration prior to immobilization and retained enzyme activity. Accurel EG100 exhibited poor immobilization efficiencies. For the EP100 the presence of the crosslinking agent glutaraldehyde resulted in enhanced immobilization and activity retention. In the case of Accurel EP400 a decrease in retained enzyme activity was observed. Maximum immobilized efficiency was observed for the Accurel EP100 and EP400 at particle sizes in the 200 µm range. Overall, half-lives of immobilized enzyme were observed to be up to sevenfold than that of enzyme in free solutions. Optimum pH values in the range 7-9 were confirmed. Optimum temperatures for lipase on the Accurel EP100 and EP400 were determined at 30ºC and 45ºC respectively.

Graphical Abstract



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