

Production of Human Milk Fat Substitutes using Immobilized *Pseudomonas cepacia* Lipase in Organic Polymer with Ionic Liquid

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Human milk fat (HMF) is mainly formed by triacylglycerols (TAG) containing palmitic acid, the major saturated fatty acid, mostly esterified at the internal position of TAG and the unsaturated fatty acids at *sn*-1,3 positions. Nowadays, the high cost of commercial non-immobilized and immobilized lipases, together with a low operational stability, have been recognized as the major constraints to their use in the food industry.

The emphasis of this work is the development of novel immobilization methods using an ionic liquid as additive to obtain a lipase (i) covalently immobilized on the organic polymer matrices (LCPC) or (ii) immobilized by entrapment in organic polymer matrices (ENPC). In immobilization techniques, the ionic liquid used was butyl-3-methylimidazolium bis(trifluoromethylsulfonyl) imide (C₁₀H₁₅F₆N₃O₄S₂). The lipase from *Pseudomonas cepacia* immobilized by both methods was tested as catalysts for the production of human milk fat substitutes by acidolysis of tripalmitin with oleic acid, in solvent-free medium. The reaction was carried out at 60°C using a molar ratio of 1:2 (tripalmitin/oleic acid), for 48 h. Oleic acid molar incorporations of 25.0% for LCPC and 11.1% for ENPC were attained.

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