ENZYMATIC SYNTHESIS OF BIODIESEL ESTERS

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Biodiesel is composed of esters of short chain alcohols with long chain fatty acids. It represents a fuel produced from renewable resources and is gaining importance, not only due to the increasing scarcity of petroleum and the high price of fuels derived from it, but also due to an increasing preoccupation with the environment. In Brazil, biodiesel is industrially produced through chemical transesterification under alkaline conditions, using ethanol and various triglycerides. Enzymatic synthesis of biodiesel is still expensive relative to the chemical process, but has the advantage of being more environmentally-friendly. This work aimed to study the synthesis of biodiesel esters using the lipase of *Burkholderia cepacia* LTEB1, a newly isolated strain. Three systems were used for ethyl oleate synthesis in *n*-heptane by esterification: addition lyophilized enzyme, addition of enzyme immobilized on a polypropylene support and addition of enzyme encapsulated in reverse micelles. The highest conversion rate was obtained with the immobilized lipase. After optimization of this system, it was possible to obtain a 100% ester yield in 3h. Good results were also obtained for transesterification reactions. The immobilized lipase was able to be re-utilized for biodiesel ester synthesis in several times, a fact that may help to viabilize the enzymatic route for biodiesel production.

Palavras-chave: *esters, synthesis, biodiesel, lipase, Burkholderia cepacia.*

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