NEW BIODIESEL BY USING A LOW COST LIPASE DERIVED FROM *THERMOMYCES LANUGINOSUS* AND A RESPONSE SURFACE METHODOLOGY

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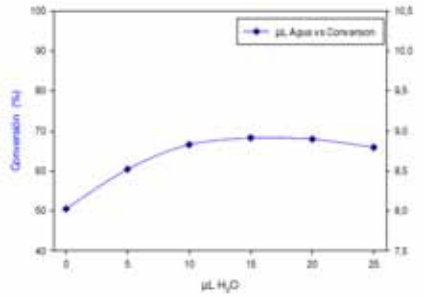
Biodiesel production has received considerable attention in the recent years as a biodegradable and non polluting fuel [1-4]. Utilizing soluble lipase biocatalyst presented an alternative approach to lipase-mediated biodiesel production. This new biodiesel integrates the glycerine as a monoglyceride, avoiding in this way its elimination. The multi factorial design of the response surface methodology (RSM) was employed to evaluate the effects on the conversion of oil into FAEE (Fatty Acid Ethyl Esters) and MG (Monoglycerides) of several conditions as temperature, molar ratio of ethanol to oil and pH. Water amount and concentration of lipase were also investigated. Soluble lipase Lipopan 50 BG, produced by submerged fermentation of genetically modified Termomyces lanuginosis/Aspergillus oryzae microorganism, was proposed here as a low cost biocatalysts for a new biodiesel production with sunflower oil. The results indicated that pH, molar ratio of ethanol to oil and water content were significant factors on the conversion.

In Figure 1 it is shown the great influence of pH, and to lesser extent of the ratio oil / ethanol (proportion) in the conversion, while temperature did not affect significantly. In another graph it is shown the influence of the water content, which presents a maximum at 15 µL of added water.



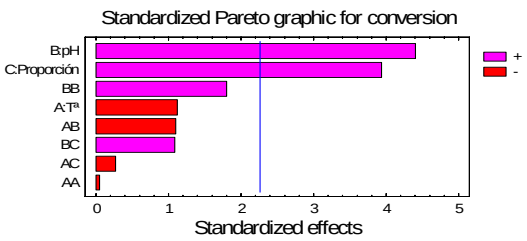


Figure 1. Water content influence and Pareto graphic.

Lipopan 50 BG can be used as biocatalyst in the production of a new kind of biodiesel that integrates glycerin as monoglycerides. It is possible to optimize conditions to prepare a new kind of biofuel with composition and properties suitable to use in diesel engines. This method has the advantages of avoiding the generation of glycerol as byproduct in the process and its short reaction time. This process minimizes waste generation and maximizing efficiency of the process.

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