SBFC
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M40: A new lipase for biodiesel synthesis

PAPER

Monday, May 01, 2017
6:00 PM - 8:00 PM
San Francisco Marriott Marquis - Yerba Buena Salons 9, B2 Lower Level

Biodiesel is a fuel produced industrially through alkaline chemical transesterification. Lipases can be used to produce biodiesel with the advantage of being more environmentally friendly. However, the enzymatic process is still expensive compared to the chemical process. In this context, new lipases discovery and the utilization of low-cost cultivation media are necessary to reach the economic viability of enzymatic biodiesel production. Hence, this study aimed to prospect new microorganism strains and to produce lipases by solid-state fermentation in wheat bran. Then, 298 microorganisms (bacteria, yeasts and filamentous fungi) were isolated from oil palm fruits. They were evaluated by qualitative tests in solid media containing triolein and olive oil as a carbon source and quantitative tests in solid-state fermentation using wheat bran. We selected the strain BDA-FI 7, an *Aspergillus* sp., to optimize lipase production. A Central Composite Rotatable Design (CCRD) was performed. The variables evaluated were: temperature (20-35 °C), moisture (45-65 %) and inoculum concentration (10^6-10^8 spores/g). Flasks were incubated, and after 168 h, lipase was extracted from the solid substrate and its *p*NPP-hydrolyzing activity was determined. The best lipase activity obtained was 55.9 U/g dry substrate. The conditions that maximize the lipase activity are 35 °C, 65 % moisture and an inoculum of 5.05 x 10^7 spores/g. At this combination, the maximum predicted yield was 58.4 U/g. Preliminary studies showed that this lipase can catalyze biodiesel synthesis (ethyl esters) in *n*-heptane as a solvent.

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