

World Biodiesel Congress & Expo

December 5-7, 2016 San Antonio, Texas, USA

A new type of high efficiency, low temperature type lipase used for biodiesel production and new biodiesel production process

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Biodiesel, was an alternative liquid fuel made from biological sources such as vegetable oils, animal fats or waste cooking oils by transesterification. Compared with chemical preparation method, enzymatic catalyzed method, owing to mild reaction conditions, low alcohol used level, easy glycerol recovery, no waste material production and so on, had been paid more attention. However, the expensive lipase obstruct the industrialization of enzymatically catalyzing technique on a large scale. Therefore, this paper used a new lipase catalyst to obtained the optimum process conditions for biodiesel. We screened out a higher esterification activity lipase. Bilesu Lp100, a lipase which tolerated temperature, pH and methanol better. For in the field of biodiesel the enzymatic properties were studied, the optimum reaction temperature was 45°C, and in less than 60°C for 12 h the activity keeping more than 80%, the optimum pH was 7.0, and the enzyme activity can be maintained over 88% between pH 4.0-8.0 solution for 12 h, better tolerated methanol. Jatropha oil as raw material, lipase Bilesu Lp100 as a catalyst, the optimum process conditions: alcohol to oil molar ratio 1.72:1, lipase concentration 112.5 U each gram of oil, and reaction time for 24 h. The average yield of biodiesel reached 96.85%. Waste oil as raw material, lipase Bilesu Lp100 as a catalyst, the lipase amount of catalyst was 58.38 U/g (oil), the reaction time was 14 h, the average yield of biodiesel reached 95.2%. An acid value of 194 mg/g fatty acids as raw material, using the two-step enzymatic and acid catalytic binding method, dropped the product of biodiesel acid value less than 1.5 mg/g.

Biography

Zunxi Huang has completed his PhD from Jiang-Nan University in China. Currently, he is the Director of Engineering Research Center of Sustainable Development and Utilization of Biomass Energy, Ministry of Education of China, Vice President of the Life Science of Yunnan Normal University. His main academic interest is engaged in the enzyme preparation for biological energy development and application. He has successfully developed a variety of high conversion rate lipase for biodiesel production and new kinds of amylase for fuel alcohol. He has published over 100 papers, and more than 40 patents.

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