J Fundam Renewable Energy Appl 2018, Volume 8
DOI: 10.4172/2090-4541-C4-060

11th World Bioenergy Congress and Expo

July 02-04, 2018 | Berlin, Germany

Industrial biodiesel production from low-cost feedstock using immobilized and soluble-free enzyme

J. Vladimir Oliveira
Federal University of Santa Catarina, Brazil

Large-scale production of biodiesel has been mostly based on homogeneous, alkali catalysis. However, biotechnological production of biodiesel with lipases has received growing attention in recent years and is undergoing a rapid development. Compared to conventional alkali-catalyzed production, the enzymatic process is considered a "green route" because it is less energy intensive and produces higher-purity products with less downstream operations. In addition, the enzymatic process is very tolerant to high acid and water contents present in waste oils and increases the biodiesel yield by avoiding the typical soap formation due to alkaline transesterification route. Edible oils with less than 1 wt% free fatty acids (FFA) have been used as feedstock for industrial biodiesel production but it is well-known that the cost of such feedstock can comprise more than 75% of the overall biodiesel production costs. Byproducts, such as soapstock, acid oils, deodorized distillates and grease strap have been suggested as alternative cheaper feedstock for biodiesel. Thus, the use of unrefined, less expensive, high FFA, lower-grade oils and fats would result in a dramatic reduction of the global costs of enzyme-catalyzed biodiesel production. The use of liquid lipases for FAME production can make the whole process cost-efficient, more competitive and sustainable. In fact, soluble free-lipase Eversa Transform 2.0® from Novozymes has been successfully employed to produce biodiesel using low-cost feedstock such as yellow grease and tallow in the enzymatic hydrolysis followed by esterification reactions for fatty acid methyl esters (FAME) production, in pilot plant units and in industrial scale (100 ton/batch).

jose.vladimir@ufsc.br