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Biocatalysts towards ever greener for production of biodiesel from non-edible oil and comparison of fuel characteristics

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The biodiesel production is the transesterification reaction which could be catalyzed either chemically or enzymatically. Enzymatic transesterification has certain advantages over the chemical catalysis of transesterification, as it is less energy intensive, allows easy recovery of glycerol and the transesterification of glycerides with high free fatty acid contents. Lipases (triacyl glycerol acylhydrolase EC 3.1.1.3) are hydrolytic enzymes that catalyze the hydrolysis and synthesis of variety of acylgcerols at interface of lipid and water. In the present study, transesterification reaction of karanjia oil was carried out by using Pseudomonas aeruginosa lipase. In this study, the effect of various parameters were optimized. Enhanced conversion 85.9 % of fatty acid to fatty acid methyl ester within 48 h at 45 °C was achieved by using lipase at a concentration of 5 % (w/v of oil), molar ratio of 1:4 (oil: methanol), methanol acyl donor, n-hexane solvent and temperature 45 °C. The biodiesel obtained was qualitatively determined by thin layer chromatography and gas chromatography. This approach might pave the way for industrial production of biodiesel equivalents from renewable resources by employing micro – organism, enabling a broader use of biodiesel – like fuel in the future.

Biography

Vinod Kumar has been a student at University of Delhi South Campus. He is pursing Ph.D. in Microbiology, under the guidance of Prof. R. K. Saxena at Department of Microbiology. His main research subject is to develop an Eco friendly system for Synthesis of bioactive molecules by enzymatic method which important in industrial sector. He has published 5 papers in reputed journals and papers presented in National/International conferences.

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Design of immobilized packed bed cell bioreactor for effective degradation of simulated cyanide containing water

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Cyanide compounds are present in abiotic and biotic components of most of the ecosystems. Cyanide is produced in plants, bacteria, yeasts and molds naturally to cope with various stresses mainly for defense purposes. However man made cyanide compounds are contributing significantly to raise the levels of cyanide in environment. Biological agents can be used as effective alternatives for cyanide degradation. In present study, an attempt has been made for complete degradation of cyanide with alginate entrapped cells of bacterial isolate CM2 in a packed bed bioreactor. Cells grown in minimal salt medium supplied with 1% glucose and 0.1% tryptone as carbon and nitrogen source respectively were harvested at 20 h and entrapped with 2% alginate beads using citrate buffer (pH 6.0). Alginate beads containing cells were packed in a column reactor maintained at 35°C. Simulated cyanide (12mM) containing water was loaded and fractions were collected after definite time intervals. Percent degradation of cyanide was then calculated for different flow rates of the simulated cyanide containing effluent. When flow rate was set to 1.5 ml per h, complete degradation of 12 mM cyanide in 10 h was observed i.e 100% removal of cyanide. The study resulted in successful design of a packed bed reactor for complete removal of cyanide from simulated waste water.

Biography

Virender kumar is B.Sc, M.Sc (Biotech), M.Phil (Biotech). He is a research scholar (UGC-JRF) at Department of Biotechnology, HP University shimla, India working on title "Development of bioresource for effective degradation and detection of cyanide". He has worked mainly on environmental bioremediation. He has published abstract in international conference.

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