Biodiesel Production by Transesterification Using Environmentally Benign Reusable Heterogeneous Catalyst

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Because traditional fossil energy resources are limited, there is a strong demand to find out an alternative energy resource which is benign to environment. Biodiesel has the potential to be a primary fuel in future. It could change the face of our planet for the better because it is a non-toxic, renewable, bio-degradable and smarter source of energy. It is a mixture of Fatty Acid Methyl Esters (FAME) which is derived from TriGlycerides (TG) (natural resources, such as vegetable oil, animal fat) through a chemical process called Transesterification. Generally, a homogeneous base (NaOH or KOH) catalyst is used for this reaction. There is a lot of limitation of this process as it requires acid treatment for neutralization to remove the catalyst also it is not a continuous process. To minimize these problems, this project is focused on improving the biodiesel production using heterogeneous catalyst. A series of Ion Exchange Resin with different basicity/ acidity were investigated as heterogeneous catalyst for the transesterification of used peanut oil with methanol. Heterogeneous catalyst can provide a new route for the environmentally benign production of biodiesel. Particulate heterogeneous catalyst can be readily separated from products following reaction allowing the catalyst to be reused, generating less waste, and consuming less energy. A trace amount of organic base, functioning as homogeneous catalyst were incorporated with Resin (heterogeneous) to find out synergistic effect and reusability of the catalyst.

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