

Biodiesel synthesis from waste cooking oil using hetero poly acid (HPA) Supported mesoporous MCM-48 as a Catalyst

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ABSTRACT

Biodiesel is an alternative biofuel produced by chemically reacting a vegetable oil or animal fat with a short-chain alcohol, such as methanol, ethanol, or butanol and a catalyst. It is an important tool for combating environmental degradation because of its eco friendly nature, liquid nature, and easy portability. However, a global debate has now emerged because this fuel is derived primarily from soybean oil or other cereals where, using food to produce fuel is not reasonable considering the increase in world population. In the present study, we have synthesized Phosphotungstic acid (HPA) supported Mesoporous MCM-48 catalyst and the synthesized materials were characterized by XRD, SEM and TEM. Catalytic activity of the above characterized materials was used to test their activity towards transesterification of waste cooking oil and ethanol also investigated. The effect of reaction temperature, catalyst concentration, ethanol: oil molar ratio and reaction time were investigated. The physical properties of the product were analyzed by diesel engine and the maximum product was analyzed by GC-Mass.