

## Preparation of Biodiesel by Three Step Method Followed Purification by Various Silica Sources

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**Abstract :** Biodiesel was prepared from Karanja oil by three step methods: saponification, acidification and esterification. In first step, saponification was done in presence of methanol and KOH or NaOH with Karanja oil. During second step acidification, various acids such as H<sub>3</sub>PO<sub>4</sub>, HCl, H<sub>2</sub>SO<sub>4</sub> were used as acid catalyst. In third step, esterification followed by purification was done with various silica sources as Ludox (colloidal silicate) and fumed silica gel. It was found that there was no significant change in density, kinematic viscosity, iodine number, acid value, saponification number, flash point, cloud point, pour point and cetane number after purification by these adsorbents. The objective of this research is the comparison among different adsorbents which were used for the purification of biodiesel. Ludox (colloidal silicate) and fumed silica gel were used as adsorbents for the removal of glycerin from biodiesel and evaluate the effectiveness of biodiesel purity. Furthermore, this study compared the results of distilled water washing also. It was observed that Ludox, fumed silica gel and distilled water produced yield about 93%, 91% and 83% respectively. Highest yield was obtained with Ludox at 100 oC temperature using H<sub>3</sub>PO<sub>4</sub> as acid catalyst and NaOH as base catalyst with methanol, (3:1) alcohol to oil molar ratio in 90 min.

**Keywords :** biodiesel, three step method, purification, silica sources

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