

## **Amphiphilic solid basic catalyst for biodiesel production: Synthesis and characterization**

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### **ABSTRACT**

The research is focusing on the improvement of heterogeneous catalyst for biodiesel production application. An amphiphilic solid basic catalyst was prepared by using ZrO<sub>2</sub> as a support and modified by impregnation of KF and KOH. In order to study the effect of basic site, various loading of KF and KOH were used. The surfaces of KF/ZrO<sub>2</sub> and KOH/ZrO<sub>2</sub> particles were then tailored by alkylsilylation of n-octadecyltrichlorosilane (OTS) and chlorotrimethylsilane (CTMS). The resulting catalysts were characterized using nitrogen adsorption analysis, FTIR, TGA, XRD, SEM and TEM. Nitrogen adsorption isotherm revealed that the surface area were decrease respect to chemical modifications. FTIR and TGA confirm the attachment of alkylsilane on the surface of the particles and the alkylsilane loading were calculated as 5 wt%. XRD analysis reveals that there are no phase changes on the synthesized catalyst suggesting that ZrO<sub>2</sub> phase is stable towards modification. SEM micrograph shows an even particle distribution with an average diameter of 4.5 micron whereas TEM shows surface coverage was generated after alkylsilylation.

### **KEYWORDS:**

Biodiesel, Heterogeneous Catalyst, Amphiphilic, Zirconia.

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