

## **Transesterification of non-edible *Jatropha curcas* oil to biodiesel using binary Ca-Mg mixed oxide catalyst: Effect of stoichiometric composition.**

### **Abstract**

Heterogeneous base catalysts were studied to develop an effective biodiesel manufacturing process with high activity and durability. Investigations were conducted on solid base CaO–MgO mixed metal oxides with different Ca/Mg atomic ratios. These catalysts were characterized by X-ray diffraction (XRD), nitrogen sorption with Brunauer–Emmer–Teller method (BET surface area), scanning electron microscopy (SEM) with energy dispersive X-ray (EDS) spectroscopy and temperature-programmed desorption of CO<sub>2</sub> (TPD-CO<sub>2</sub>). The catalytic activity was evaluated by transesterification of non-edible oil (*Jatropha curcas* oil) to its corresponding fatty acid methyl ester. Under optimum condition: 3 h reaction time, 25:1 methanol/oil molar ratio, 3 wt.% catalyst loading and 120 °C reaction temperature, a series of calcium-based mixed oxide catalysts with different Ca/Mg atomic ratio produced a FAME yield in the range of 75–90%.

**Keyword:** Biodiese; FAME; Methanolysis; Heterogeneous catalysts; Base catalysts.