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**Preparation of calcium containing mixed oxides as solid base catalysts
for the application in biodiesel synthesis**

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Biodiesel (fatty acid methyl esters - FAME) has been found suitable for using as an alternative fuel in diesel engine. The conventional method for biodiesel production is transesterification of vegetable oils or animal fats with short-chain alcohols in the presence of catalysts. From an economic point of view, calcium oxide (CaO) is the most widely used and exhibits good catalytic properties for transesterification of triglycerides to biodiesel.

In order to study the effect of solid base catalysts for biodiesel production, transesterification of edible sunflower oil with methanol was carried out in the presence of series of CaO-based oxides, obtained by mechanochemical treatment of CaO or CaCO₃ with other metal oxides, followed by calcination.

Mechanochemical treatment of starting powders mixtures was performed in a planetary ball mill using two different milling media, hardened steel or zirconia vials and balls. The prepared catalysts were characterized by X-ray diffraction (XRD), base strength using Hammett indicator method and the particle size using laser diffraction distribution (PSLD). All the experiments were carried out at different reaction conditions in 300 cm³ batch autoclave equipped with a heater and mixer. The calcium containing mechanochemically prepared catalysts were found to have enhanced activity compared to conventionally prepared catalysts.