

## **Biodiesel production via transesterification of *Nannochloropsis oculata* microalga's oil using calcium methoxide as heterogeneous catalyst**

### **Abstract**

The main challenges facing the commercialization of biodiesel are: profitability, feedstock availability and low cost efficient production process. Although worldwide production of vegetable oil feedstocks is sufficient enough, big area of land needed for cultivating such feedstocks is the major drawback. Algae-biomass (including macro- and microalgae) is gaining interest from many current researchers as they have potential to provide sufficient fuel for global consumption. Algae can be produced fast with high lipid content. Moreover, it can provide food avoiding future starving and allow replacing fossil fuels through carbon-neutral biofuels for combustion machines in the transport, industrial and agricultural sectors. In this study, high grade biodiesel was produced from microalgae derived lipids (*Nannochloropsis oculata*) via transesterification reaction with methanol using calcium methoxide catalyst. The results showed excellent performances with high yield (92 %) of biodiesel at 60 °C compared to the highest yield reported at 22 % with using MgZr catalyst. Interestingly, calcium methoxide catalyst could be also successively reused for five times with the maintained biodiesel yield. Biodiesel produced from microalgae oil had high content of polyunsaturated fatty acids, which made it highly suitable as winter grade biodiesel.

**Keyword:** Microalga oil; Heterogeneous catalyst; Biodiesel