

## TREATMENT OF CLAY WITH IRON AND NICKEL: NEW SOLID CATALYST FOR BIODIESEL PRODUCTION

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**Abstract.** Biodiesel has been produced by transesterification of sunflower oil with ethanol in the presence of a bentonite obtained from Maghnia (western Algeria) as heterogeneous catalyst. Conversion sunflower oil to biodiesel was compared with the ethanolysis in the presence of NaOH. The bentonite(B) was associated with iron (III) and nickel (III), the mass ratio of metals/bentonite was 0.0625. These systems: nickel/bentonite (Ni/B), iron/bentonite (Fe/B) and natural/bentonite (B) were characterized and used as catalysts for the transesterification of sunflower oil with ethanol. The effect of reaction time, reaction temperature and catalyst type was studied. The results showed that NaOH has the highest catalytic activity under the optimized reaction conditions. Maximum oil conversion of 80 % was obtained with homogeneous NaOH catalyst under conditions: catalyst concentration 1.5%, reaction time 2 h and temperature 70°C. Ni/B, Fe/B and B have an activity with respective conversion rates of 53.76%, 42.36% and 36.30%. The initials reactions rates give the following order: NaOH> Ni/B > Fe/B > B.

**Keywords:** Biodiesel, sunflower oil, heterogeneous catalyst, bentonite.