

عنوان مقاله:

Heterogeneous Catalyst HZSM5 in Biodiesel Production from Rapeseed Oil in Batch Process

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خلاصه مقاله:

In this paper, HZSM5 zeolite was synthesized through reflux method on support material CaO (25, 35 and 45 wt%) in two specific methods: microwave and impregnation at high temperature. The zeolite catalyst was modified with impregnation of NaOH (2, 4, 8, 12 wt%) at room temperature. The modified zeolite was used in transesterification of rapeseed oil with methanol in a batch catalytic process. In transesterification of rapeseed oil, the catalytic activities of HZSM5, NaZSM5, KZSM5 were considered. The prepared catalysts were characterized by several techniques such as X-ray diffraction (XRD), Brunauer Emmett Teller (BET) surface area and also the surface image was scanned by scanning electron microscopy (SEM). The parameters affecting on biodiesel yield at optimum reaction conditions were investigated. The maximum yield was achieved with 8 wt% of NaOH loaded on HZSM5 at reaction temperature of 65°C, reaction time of 12 hours and catalyst/oil mass ratio of 9. Also the yield of CaO loaded with impregnation at high temperature was more desired than CaO loaded with microwave. Meanwhile the catalytic activity of HZSM5, NaZSM5 and KZSM5 was nearly zero; and the catalytic activity of modified zeolite was HZSM5 > NaZSM5 > KZSM5 subsequently.

کلمات کلیدی:

,Transesterification, Biodiesel, Heterogeneous catalyst, CaO-HZSM5, Methanol/Oil ratio

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