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Nano-structured super catalytical clays for production of biodiesel from peach waste oil

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Biodiesel was determined as a good friendly and alternative source of petroleum diesels which are non-renewable. Mostly homogeneous catalysts were used to convert biodiesel from fatty acids of different feed stocks but for higher yield of biodiesel heterogeneous catalysts are more attention because of their good characters like reusability and not production of waste water. However, nowadays nano catalysts have good quality and characters with different support composite. Present research experiments were investigated production of biodiesel having good quality parameters which has the similar characters like biodiesel international standards. Seeds of two types of fruits *Prunus persica* was collected from local market, fruit and juice shops. There were following steps: feedstock drying, raw material grindings, extraction of oil from dried seeds, filtration of oil, oil refined by charcoal, dehydration of oil with sodium sulfate and vacuumed filtration. Nano catalysts of zeolite with different clays composites were used to produce biodiesel. The calcinized composite of Bentonite clay with zeolite is the best catalyst to produced biodiesel because it has suitable pore distribution, higher surface area and larger surface area. When catalyst is combined into support, and structural qualities of catalysts are effected. Three parameters of transesterification were varied the biodiesel yield i.e., concentration of catalyst, reaction time and reaction temperature at same methanol ration and same stirring intensity. It was detected that peach oil gave maximum yield of 99.1% respectively with 0.3% catalyst of Bentonite-Zeolite calcinized composite at 600C and at optimized reaction time was 4 hours for maximum biodiesel yield. Different physical quality parameters were observed i.e., pH ,specific gravity, density, iodine value, saponification value, cetane number, cloud point and pour point and acid value by varies reactions. GC-MS analysis was used to characterize the composition of biodiesel samples. FTIR and SEM/EDX analysis were used to check the composition of nano-catalysts with support composites.

Keywords: *Prunus persica*, Nanocatalyst, Zeolite, Saponification value, SEM/EDX, Biodiesel

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