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Comparative study of biodiesel properties from waste oil, refined and unrefined sunflower oils: Effect of process parameters

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Abstract. In this paper, the possibility of producing biodiesel using refined, unrefined and waste cooking oil, with the use of methanol in the transesterification reaction, will be examined. Potassium hydroxide was used as a catalyst in homogeneous catalysis. Various biodiesel properties were measured and compared with the ASTM D6751 and EN 14214 standards, in order to determine the quality. Biodiesel obtained from refined and unrefined sunflower oil meets the standards, because it has a low viscosity, acid number below 0.5 mg KOH/g and good properties at low temperatures, while biodiesel from waste oil showed increased moisture (> 0.08 %) and poor properties at low temperatures. The research showed that both refined and unrefined sunflower oil can serve as raw materials for biodiesel, while further research is needed for waste oils as raw materials for biodiesel production.

***Keywords*:** biodiesel; homogeneous catalyst; refined oil; transesterification; waste cooking oil.

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