

Production of Biodiesel from Avocado Waste in Hossana City, Ethiopia

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Abstract : The production of biodiesel from waste materials is becoming an increasingly important research area in the field of renewable energy. One potential waste material source is avocado, a fruit with a large seed and peel that are typically discarded after consumption. This research aims to investigate the feasibility of using avocado waste as a feedstock for the production of biodiesel. The study focuses on extracting oil from the waste material using the transesterification technique and then characterizing the properties of oil to determine its suitability for conversion to biodiesel. The study was conducted experimentally, and a maximum oil yield of 11.583% (150g of oil produced from 1.295kg of avocado waste powder) was obtained from avocado waste powder at an extraction time of 4hr. An 87% fatty acid methyl ester (biodiesel) conversion was also obtained using a methanol/oil ratio of 6:1, 1.3g NaOH, reaction time 60min, and 65°C reaction temperature. Furthermore, from 145 ml of avocado waste oil, 126.15 ml of biodiesel was produced, indicating a high percentage of conversion (87%). Conclusively, the produced biodiesel showed comparable physical and chemical characteristics to that of standard biodiesel samples considered for the study. The results of this research could help to identify a new source of biofuel production while also addressing the issue of waste disposal in the food industry.

Keywords : biodiesel, avocado, transesterification, soxhlet extraction

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