

Conference Abstract

Production of biodiesel from locally available Pumpkin seeds: A comparison with coconut oil

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*yshiva@univ.jfn.ac.lk**Abstract**

Petroleum based economy is suffering from a series of problems like enhanced greenhouse effect and global warming. Burning of fossil fuel causes accumulation of the greenhouse gases in the environment that leads to enhanced greenhouse effect. Besides this effect, the cost of crude oil continues to rise due to its diminishing supply; therefore, production of fuel from alternative sources is needed. In this regard, biodiesel is at the forefront due to its nontoxic nature.

This study aimed to produce biodiesel from locally available pumpkin seeds. Oil was extracted from pumpkin seeds in n-hexane solvent. The yield of pumpkin oil was found to be 60.05%, whereas a yield of 71.25% was attained for coconut oil extracted using dried coconut flesh, which was used herein for comparison purpose. Free fatty acid content of each crude oil sample was deduced by the pre-esterification process in the presence of HCl (5% w/w) and methanol (methanol to oil ratio 6:1). Then, the crude oil samples were converted into methyl ester of fatty acids by the process of base catalysed transesterification. The yield percentage of the methyl esters of pumpkin oil and coconut oil were found to be 32.00% and 72.27%, respectively. Important physiochemical properties, such as pH, density, specific gravity, acid value, saponification value, iodine value, cetane number, molecular weight, and higher heating value were determined for both oil samples and methyl esters of fatty acids using ASTM and EN standard test methods, and these values were comparable with biodiesel standards. In summary, this study opens up an avenue to produce the biodiesel using the locally available pumpkin seeds, which can be obtained through out the seasons.

Keywords: Pumpkin seed oil, Coconut oil, Pre-esterification, Transesterification, Biodiesel