

عنوان مقاله:

Optimization and Biodiesel Production from Prosopis Julifera Oil with High Free Fatty Acids

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نویسندگان:

M Rajeshwaran - *Department of Mechanical Engineering, Mohamed Sathak Engineering College, Ramanathapuram – ۶۲۳ ۸۰۶, Tamil Nadu, India*

P Ganeshan - *Department of Mechanical Engineering, VSB Engineering College, Karur - ۶۳۹ ۱۱۱, Tamil Nadu, India*

K Raja - *Department of Mechanical Engineering, Anna University, University college of Engineering, Dindigul - ۶۲۴۰۰۵, Tamil Nadu, India*

خلاصه مقاله:

Prosopis julifera is a non-edible feedstock found in the arid and semi-arid regions was used for the production of biodiesel. Solvent extraction technique was used for oil extraction from Prosopis julifera. The present work mainly concentrates on the three step process of biodiesel production from Prosopis julifera oil. The acid value of Prosopis julifera oil was reduced below 1% using acid catalyst 1% v/v H₂SO₄ followed by esterification process using alkaline catalyst (KOH). Transesterification reaction is found to be affected by the reaction variables namely methanol to oil molar ratio, amount of catalyst used, reaction time and reaction temperature. Gas chromatography was used to analyse the Fatty acid methyl esters. The methyl ester obtained from the previous step was refined to produce biodiesel. The fuel properties of Prosopis julifera methyl ester (PJME) such as viscosity, cetane number, flash point, acid value, etc were determined and compared according to the ASTM standards. The optimum reaction conditions of Methanol/oil molar ratio of 9:1v/v, reaction temperature of 550C, reaction time of 2 hrs and 0.75% w/v of KOH usage were determined. Response surface Methodology (RSM) technique was used to optimize the maximum yield of Prosopis julifera methyl ester.

کلمات کلیدی:

Prosopis julifera; Acid Esterification; Transesterification; Process optimization

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