



Optimization of Biodiesel Production from *Ceiba Pentandra* (Kapok Seed Oil) Using Response Surface Methodology Assisted by Ultrasonic Energy Method

K.Ponappa¹, V.Velmurugan², P.Arul Franco^{3*}, T.R Kannan³ and R.Ragurajan⁴

¹Department of Mechanical Engineering, Kongu Engineering College, Perundurai, Tamil Nadu, India.

²Government Industrial Training Institute, Bodinayakanur, Tamil Nadu, India

³Department of Mechanical Engineering, University College of Engineering, Nagercoil, Tamil Nadu, India.

⁴Department of Mechanical Engineering, St Xavier's Catholic College of Engineering, Chunkankadai, Tamil Nadu, India.

Abstract : Application of ultrasonic energy-assisted biodiesel production method from *Ceiba pentandra* (Kapok seed oil KSO) catalyzed by KOH catalyst was studied at different conditions. Response Surface Methodology (RSM) based on central composite rotatable design (CCRD) was employed to optimize the four important process parameters such as methanol/oil molar ratio (X_1), KOH catalyst concentration (X_2), reaction time (X_3) and reaction temperature (X_4) for transesterification of KSO oil using ultrasonic energy. The results of the experimental matrix were analyzed. It was found that the optimal reaction parameters were found to be methanol/oil molar ratio (10.29 mol/mol), KOH catalyst concentration (1.55wt %), reaction time (32.37 min) and reaction temperature (38.45°C) for a biodiesel yield of 99.40%. The determined properties of KSO biodiesel were within the recommended biodiesel standards limits.

Keywords: Biodiesel, Transesterification, RSM.

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