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PARAMETRIC OPTIMIZATION OF BIODIESEL SYNTHESIS FROM RUBBER SEED OIL USING IRON DOPED CARBON CATALYST BY RESPONSE SURFACE METHODOLOGY

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ABSTRACT

The best way to meet the demand for traditional feedstock as an alternative sustainable energy source is by improvising biodiesel production by employing heterogeneous catalyst and its parametric optimization. The present work used RSM (response surface methodology) in conjunction with the CCD (central composite design) for optimizing the activity of catalysts for the biodiesel production. The optimized parameters are time, temperature and catalyst percentage and considered response factors are catalytic conversion and activity. Indigenously prepared iron doped catalyst (Fe/C) is used for the synthesis of biodiesel from rubber seed oil (RSO). The optimized condition obtained by maximizing the catalytic conversion to 51-97 and activity to 53.2-67.9 are time 45 minutes, temperature 85ºCand catalytic percentage 2.5%. The study reveals that both the amount of catalyst loaded on the support, temperature and the time had significant positive effects on the biodiesel yield. Hence, the investigation reached to a conclusion that the rubber seed oil could be an effective feedstock for the production of biodiesel using novel iron doped catalyst at optimized condition to synthesis energy efficient and cost effective Rubber seed oil methyl ester(RSME) towards the production of sustainable energy.

KEYWORDS: RSM (Response Surface Methodology), Rubber Seed Oil (RSO) & Sustainable Energy