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Research Paper

Optimization of conversion of *Pongamia pinnata* oil with high FFA to biodiesel using novel deep eutectic solventSantosh Ashok Kadapure ^a✉, Kiran A ^a, Anant J ^a, Dayanand N ^a, Rahul P ^a, Poonam K ^b✉

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Outline



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Abstract

Despite the fragile bio-fuel market of the present day, numerous research works are being carried out all over the globe to discover a viable alternate source to fossil fuels. The present work envisages developing deep eutectic solvent (DES) for maximization of biodiesel yield from *Pongamia pinnata* (Feed) oil containing high free fatty acid (FFA). In the present work, transesterification reactions for feed oil were carried out with sodium hydroxide (NaOH) as catalyst and with prepared various DES (choline chloride and acetic acid, oxalic acid and urea) in the Salt/Hydrogen bond donor ratio of 1:2. The best yields were found to be around 94.6% for the reactions with methanol in the molar ratio of 6:1 and 1% of NaOH for DES 2 (10%) mixture at residence time of 150 min. The same reaction with DES 1 and DES 3 also yielded satisfactory results (yields 11.6% greater than DES 0 mixture). The quality of biodiesel produced was judged by comparing physico-chemical properties of FAME (viscosity, density, flash point and calorific values) with ASTM standards which was within acceptable limits. The results give clear evidence showing use of DES improves yield of FAME. The findings obtained in this work may provide a scientific basis for the potential application of DES synthesized from choline chloride and acetic acid, oxalic acid and urea as a co-solvent in p

FEEDBACK