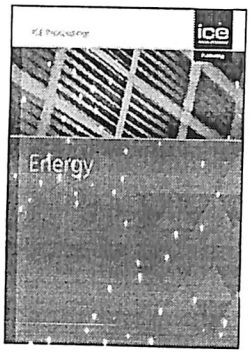

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Experimental investigation on biodiesel production incorporating deep eutectic solvents

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Abstract

In recent years, biodiesel has been proving to be a remarkable alternative for petro-diesel. In this research study, an effort has been made to improve the yield of biodiesel by using a synthesised novel deep eutectic solvent (DES). The synthesised DES of different composition was checked for its superiority for biodiesel production using sesame oil. Experiments were conducted with different parameters such as molar ratio of alcohol to oil and agitation speed at fixed temperature and contact time. The molar ratio of methanol to oil is 8:1, at a temperature of 60°C and a reaction time of 60 min proved to be the optimum condition for DESs. All tested DESs have been able to improve the yield of biodiesel compared to non-DES. The highest yield of biodiesel (97·8%) has been achieved by using ethylene glycol as the hydrogen donor in the ratio 1:2 and at a molar ratio of 8:1 with agitation speed of 1200 r/min. All the properties of prepared biodiesel met the American Society for Testing and Materials standards such as viscosity, flash point and specific gravity. The synthesised choline chloride-DES proved to be effective in improving the yield of biodiesel and thus can be used as an alternative to ionic liquids.

Full Text

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