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Synthesis and Physico-Chemical Analysis of Jatropha curcas Seed Oil for ISO VG32 and VG46 Applications

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Abstract : Transesterification of jatropha methyl ester (JME) with the common polyol, trimethylolpropane (TMP) produced the TMP based ester which exhibits improved temperature properties. This paper discusses the physic-chemical properties of jatropha bio-lubricant base oil applicable for ISO VG32 and VG46 requirement. The catalyst employed for the JME was CaO synthesized in National Research Institute for Chemical Technology (NARICT) that gives 100% conversion. The molar ratio of JME to TMP was 3.5:1 and the catalyst (NaOCH3) loading were found to be 0.8% of the weight of the total reactants. The final fractionated jatropha bio-lubricant base was found to contain 11.95% monoesters, 43.89% diesters and 44.16% triesters (desired product). In addition, it was found that the bio-lubricant base oil produced is comparable to the ISO VG46 commercial standards for light and industrial gears applications and other plant based bio-lubricant.

Keywords : biodegradability, methyl ester, pour point, transesterification, viscosity index
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