

Experimental Investigation of High Alcohol-Low Viscous Renewable Fuel in DI Diesel Engine

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Abstract

An experimental investigation of orange oil methyl ester with ethanol (E) and diethyl ether (DEE) is presented in this work. The biodiesel preparation was carried out with the clear knowledge on performance and emission characteristics of stationary single cylinder agriculture purpose direct injection diesel engine subjected to the hybrid combination of orange oil methyl ester (OME) and oxygenated additives. Prepared orange oil methyl ester was analysed using GC-MS. On engine analysis, it was observed that there was an increment in BTE with a decrement in BSEC with oxygenated fuel blends than neat diesel. Also, increase in CO emission was observed for all oxygenated fuels with a decrease in HC and NO_x emissions at all loads except for DEE blended fuels. Reduction in smoke emission observed for all oxygenated fuels. It was found that addition of oxygenated additives to biodiesel improved performance and reduced emission.

Keywords: Orange oil methyl ester, oxygenated additives, performance and emission