

INVESTIGATION OF BLENDED PALM BIODIESEL-DIESEL FUEL PROPERTIES WITH OXYGENATED ADDITIVE

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ABSTRACT

Blended biodiesel fuel is considered as an alternative to current fossil fuels in many applications, at low blending level less than 20% biodiesel. The fuel physical characteristics are among the most important parameter to determine the quality of each fuel. Though biodiesel can replace diesel satisfactorily, problems related to fuel properties persist. In this study diethyl ether (DEE) was used as additive to the palm biodiesel-diesel blended fuel B30 and B40 in the ratios of 2% and 6% by volume and tested for their properties improvement according to ASTM D7467 standard procedures. The tested fuel samples were compared with diesel fuel (D) and palm biodiesel (B100). The minimum pour point for the blended fuel was -7 °C for B30DE6 compared to 14 °C for palm biodiesel, the results shows that the best properties was for B30DE6 where the presence of diethyl ether additive helps to reduce the viscosity by 35%, density by 3.6% and acid value by 57% compared to palm biodiesel. On the other hand, a slight decrease in the energy content has been found with increasing additive and blending portion compared to pure diesel and the lower energy content value was for palm biodiesel. However, the properties of biodiesel and its blended fuel with additive still meet the requirement of ASTM D7467 standards.

Keywords: Palm oil biodiesel • Blending • Diethyl ether • Diesel • Fuel properties •