

Influence of 1-Butanol Additives on Palm Biodiesel Fuel Characteristics and Low Temperature Flow Properties

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ABSTRACT

Diesel engines are widely used in almost all professions and cannot be dispensed with in the near future. Now the fossil fuels which are mainly used in diesel engines are depleting continually accompanied by increasing consumption and prices, there is the need to find alternative fuel to fulfil the world's energy demand. Alternative fuels like biodiesel, are being used as effective alternative for diesel. The feasibility of biodiesel production from palm oil was investigated with respect to its fuel properties. Though biodiesel can replace diesel satisfactorily, problems related to fuel properties persist. In this study an oxygenated additive 1-butanol (BU) was blended with palm oil biodiesel (POME) in the ratios of 1%, 3%, 5% and 7% and tested for their properties improvement. These blends were tested for energy content and various fuel properties according to ASTM standards. Qualifying of the effect of additive on palm biodiesel fuel properties can serve the researchers who work on biodiesel fuels to indicate the fuel suitability for diesel engines according to fuel standards. Blends of BU in POME resulted in an improvement in acid value, viscosity, density and pour point with increasing content of BU in the blend. Further improvement in the pour point temperature of the palm oil methyl esters 1-butanol blends (B-BU) at 7°C can be achieved by adding 7% BU additive to POME, accompanied by 8.07% decrease in energy content of biodiesel. © (2014) Trans Tech Publications, Switzerland.

KEYWORDS: 1-butanol blends; Diesel; Energy continent; Fuel properties; Palm oil biodiesel

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