

CHARACTERIZATION OF KARANJ BIODIESEL FOR GAS TURBINE APPLICATIONS

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Abstract

Bio-diesel, derived from renewable resources is fatty acid alkyl esters. It is an alternative diesel fuel and can be derived from vegetable oils (triglyceride) through trans-esterification process. In this process triglycerides reacts with alcohol in the presence of base catalyst and form alkyl esters and glycerol. In this work different parameters are summarized which are affecting on trans-esterification process. The physical and chemical properties of karanj bio-diesel are determined. The fatty acid compositions are determined by using High Performance Liquid Chromatography (HPLC). There is a definite relation in between the composition and the properties of the biodiesel. So the effect of these fatty acid compositions on the properties of bio-diesel have also been explained such as viscosity, heat of combustion, cetane No, cold flow properties, lubricity and oxidative stability etc. By analyzing the properties and the composition of karanj oil biodiesel, it is found suited for stationary gas turbine applications. To reduce the production cost and ensure its quality with less expensive quality test, testing of bio-diesel by HPLC is a good option.

Keywords: Karanj oil bio-diesel, triglycerides, gas turbine, alternative fuels, emission, trans-esterification, HPLC.