Combustion Characteristics of Biodiesel Blended With Al_2O_3 and SiO_2 Nanoparticles

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ABSTRACT

This experiment study the effect of nanoparticles blended in biodiesel on combustion characteristic of single-cylinder four-stroke diesel engine. Biodiesel used in this experiment was Palm Oil Methyl Ester (POME) and nanoparticles used was Aluminum oxide (Al_2O_3) and Silicon dioxide (SiO_2). Both nanoparticles was dispersed in POME by using an ultrasonicator with the dosage of 50 ppm. The fuel was labelled as PS50 for POME + SiO_2 blend and PA50 for POME + Al_2O_3 blend. These fuel was tested with a YANMAR TF120M model diesel engine with load variation from no load until 28 N.m load with constant engine speed at 1500 rpm. Results shows that peak pressure of PS50 fuel was higher than PA50 fuel during all loads engine operations and the biggest difference was with no load applied, where the difference was 2.89%. Other than that, exhaust gas temperature of PS50 blends recorded also shows that it was lower than PA50 blends.

Keywords: Diesel engine; combustion, nanoparticles