ABSTRACT

This study is aimed to investigate the effect of blending different types of nanoparticles with biodiesel B20 produced from waste cooking oil on engine performance. Specifically, we compared the engine performance of biodiesel B20 blended with two different nanoparticles, including Titanium dioxide, Aluminum oxide. The test engine bed is equipped with an eddy current dynamometer and a load regulator with a torque controller. The performance parameters such as brake power, brake thermal efficiency, specific fuel consumption, mechanical efficiency and BMEP are measured using computerized engine test express software 8.5. The AVL smoke meter is used to measure the emission characteristics such as smoke, carbon monoxide, hydrocarbon and oxides of Nitrogen emission. The results showed that blending of nanoparticles with neem and jatropha oil biodiesel blended with B20 improved engine performance in various ways, including increased brake power and torque, reduced specific fuel consumption, and reduced emissions of smoke, carbon monoxide, and hydrocarbons. In our project, we selected Titanium dioxide and Aluminum oxide blended waste neem and jatropha oil biodiesel blended with B20. The performance and emission characteristics of above nanoparticles are tested in VCR engine to improve the engine performance and emission. The study was conducted using a single-cylinder, water-cooled, direct injection diesel engine with a rated power output of 4.4 kW at 1500 rpm. The engine was run on biodiesel B20 blended with different types of nanoparticles at a concentration of 50 parts per million (ppm) by weight. The nanoparticles used in the study were chosen based on their potential to improve the combustion characteristics of the biodiesel, reduce emissions, and