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WASTE COOKING OIL BIODIESEL BLENDS; ENGINE PERFORMANCE AND EMISSION CHARACTERISTICS

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Abstract

Sustainable production of cost-effective, renewable, and clean energy sources has become a globally discussed topic, as the current energy sources especially, petroleum fuel, is facing a crisis and becoming a serious environmental threat. This situation affects seriously the transportation sector, where currently no clear solution instead of fossil fuels. Among many solutions, biodiesel seems like a potential source and hence proper analysis should be done prior to application into automobiles, and this became the main scope of the work reported herein. Experimental tests have been carried out to evaluate the effect of biodiesel originating from waste cooking oil on the performance and emission of a diesel engine. 5%, 10%, 20%, and 30% biodiesel blends of petroleum diesel were applied to the model diesel engine under a constant fuel compression ratio (16) and engine speed (1500 rpm). Further. an exhaust gas analyzer was employed to measure CO emissions in the line. More importantly, there is no performance reduction even up to a 20% blend and the performance observed was similar to that of pure petroleum diesel. Further, considering the engine economy, a biodiesel blend was observed as a fuel with low specific fuel consumption, and hence, it is more economical than that petroleum diesel. Furthermore, emission studies also showed significant results, and a significant reduction in carbon monoxide emission was observed under all operating conditions. Therefore, the study reveals the potential of the biodiesel-petroleum diesel blend for existing diesel engines for successful and smooth operation.

Keywords: *biodiesel, emission, engine performance*