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Performance and combustion characteristics of a diesel engine fueled with waste vegetable oils

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The present study aims to investigate the impacts of biodiesel blend ratio on biodiesel's performance, combustion and emission characteristics. Experiments were conducted using JCB 444 TCA 74kW engine for neat biodiesel B100 and its blend fuels with B5, B10, B15,B20, B30 and B40 of biodiesel at different engine speeds and loads conditions without exhaust gas recirculation. The indicated engine power and torque using biodiesel were found to be lower than that of using diesel fuel for all of tested loads. The decreased of engine power and torque with biodiesel can be attributed to the lower calorific value of biodiesel. An obvious decrease in carbon monoxide (CO) and total hydrocarbon (THC) emissions was attained with the addition of biodiesel. Moreover, emissions of nitrogen oxides (NOx) were simultaneously reduced compared with using standard diesel fuel at low to middle loads. Finally, the strategy with biodiesel blends showed better combustion, emission characteristics as well as economy performance among all the fuels. For the efficient use of biodiesel blend fuels, it is suggested that the blend ratio should be carefully selected based on the engine operating conditions.

Speaker Biography

Abdullah Ali Abuhabaya has graduated from Um-Alqura University with Bachelor's degree in Mechanical Engineering in 2002, and the University of Huddersfield in UK with Master of Science in automotive system design and analysis and then PhD in Mechanical Engineering in 2012. His research interests are in Biofuels, Engine performance and exhaust gas emission analysis, also in design and analysis of machines. He participated in a number of International conferences and workshops in UK, China, Turkey and Cyprus and published a lot of work papers in alternative fuels for internal combustion engines.

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