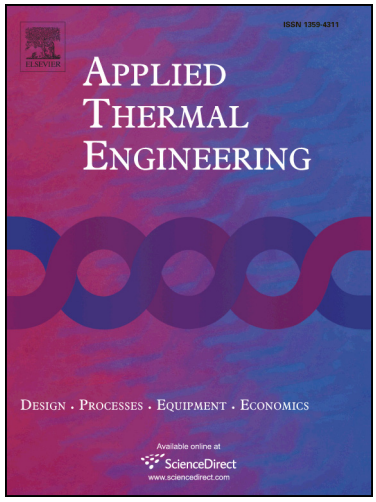

Performance and combustion characteristics of a diesel engine fuelled by butanol-biodiesel-diesel blends

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Performance and combustion characteristics of a diesel engine fuelled by butanol-biodiesel-diesel blends

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Abstract

Using renewable alternative fuels in the diesel engines has been grown recently. The aim of the study was to experimentally investigate and compare the performance, combustion characteristics, NO emissions, and stability of a diesel engine fuelled by five different fuels, which included diesel, biodiesel, and different blends of diesel-biodiesel-butanol mixtures. All the tests were conducted using a single-cylinder direct-injection diesel engine at a speed of 1500 rpm and different engine load conditions. It was found that the optimum alternative fuel among all the tested fuels was the B50 fuel blend as its use increased the maximum engine thermal efficiency by 6.5% and decreased the lowest engine brake specific fuel consumption by 5% compared to the diesel fuel. NO emission increased significantly with increasing the engine load and increased slightly with using oxygenated fuels. The change of fuel type had no significant effect on the combustion start timing while the combustion duration increased with increasing the engine load. All the tested fuels did no negatively affect the engine stability.

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