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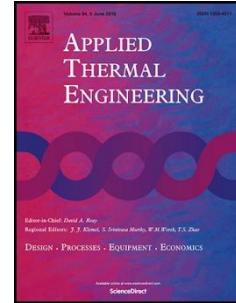
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IMPACT OF ALCOHOL ADDITION TO DIESEL ON THE PERFORMANCE COMBUSTION AND EMISSIONS OF A COMPRESSION IGNITION ENGINE

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Highlights

- Investigates the effect of alcohols addition to diesel on CI engine performances.
- Thermal efficiency increases marginally with ethanol and methanol addition to diesel.
- Ignition delay for blended fuels is increased resulting higher heat release.
- Peak pressure rise is lower for alcohol blended fuels.
- NO_x, specific PM and smoke emissions decrease significantly.

Abstract

An attempt has been made to simulate a compression ignition engine using diesel-ethanol and diesel-methanol blends as fuels. The engine considered for the simulation is a single cylinder, naturally aspirated, water cooled, direct injection, four stroke diesel engine. During the simulation the speed and the static injection timing are kept constant at 1500 rpm and 23°bTDC respectively. The commercial software named Diesel-RK used for this work is capable of predicting performance and combustion characteristics of the engine as well as the formation and emission of different harmful pollutants from it. The analysis of the predicted results shows that the efficiencies increase slightly and BSFC increases with methanol as well as ethanol addition to diesel. Most of the harmful pollutants in the exhaust are reduced significantly except CO₂ with the use of alcohol blended fuels. Reduction in NO_x emission is more with diesel-ethanol blend compared to diesel-methanol blend. The reverse trend was observed in the case of particulate matter and smoke emission.

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