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Effect of D–DEE–E Blend and Various Operating Parameters on CI Engine Performance: An Experimental Study

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Abstract

All over the, world air pollution has become a big threat for the future of the next generation and as such researchers are working relentlessly to find an alternative clean fuel in other green fuel recourses for running compression ignition engines. Diethyl ether and ethanol both are a type of oxygenated fuel and are capable of reducing exhaust emission and improving the combustion process. In this study, performance characteristics have been analyzed in a single-cylinder diesel engine with a blend of diesel (80%), diethyl ether (10%), and ethanol (10%). The experimental investigation concluded that brake thermal efficiency increases with the injection pressure and compression ratio. At compression ratio 19.5 and standard injection pressure, the blended fuel's efficiency was 4.4% greater than diesel's at peak engine load. For the blended fuel, at 210 bar injection pressure and normal compression ratio, the efficiency was 2.5% higher than those of diesel. Oxides of nitrogen decrease with higher injection pressure and increase with a higher compression ratio were observed. The lowest oxides of nitrogen were obtained with 210 bar and 17.5 compression ratio (at full load), which was low as a comparison to the diesel for the same condition.

Keywords

Diesel engine

Diethyl ether

Ethanol

Brake thermal efficiency

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