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Experimental Investigation Performance Improvement and Emission Reduction in DI Diesel Engine Fuelled with Methyl Ester of Soybean Oil Using Antioxidant

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Abstract

Biodiesel offers cleaner combustion over conventional diesel fuel, including reduced particulate matter, carbon monoxide and unburned hydrocarbon (HC) emissions. However, several studies point to increase in NO_x emissions for biodiesel fuel compared with conventional diesel fuel. In this paper, the experimental investigation on the effect of antioxidant additive (2-ethylhexyl nitrate) on NO_x emissions in a methyl ester of soybean oil- (MESO) fuelled direct injection diesel engine has been reported. The antioxidant additive is mixed in various proportions (100–400 mg) with MECO and was tested in computerised four-stroke water-cooled single-cylinder diesel engine of 3.5kW rated power. Results show that the antioxidant additive is effective in controlling the NO_x and HC emissions of MESO-fuelled diesel engines.

Key words: 2-ethylhexyl nitrate, antioxidant, soybean oil.