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INFLUENCE OF DISTILLATION ON PERFORMANCE, EMISSION, AND COMBUSTION OF A DI DIESEL ENGINE, USING TYRE PYROLYSIS OIL DIESEL BLENDS

ABSTRACT

Conversion of waste to energy is one of the recent trends in minimising not only the waste disposal but also could be used as an alternate fuel for internal combustion engines. Fuels like wood pyrolysis oil, rubber pyrolysis oil are also derived through waste to energy conversion method. Early investigations report that tyre pyrolysis oil derived from vacuum pyrolysis method seemed to possess properties similar to diesel fuel. In the present work, the crude tyre pyrolysis oil was desulphurised and distilled to improve the properties and studied the use of it. Experimental studies were conducted on a single cylinder four-stroke air cooled engine fuelled with two different blends, 30% tyre pyrolysis oil and 70% diesel fuel (TPO 30) and 30% distilled tyre pyrolysis oil and 70% diesel fuel (DTPO 30). The results of the performance, emission and combustion characteristics of the engine indicated that NO_x is reduced by about 8% compared to tyre pyrolysis oil and by about 10% compared to diesel fuel. Hydrocarbon emission is reduced by about 2% compared to TPO 30 operation. Smoke increased for DTPO 30 compared to TPO 30 and diesel fuel.

KEYWORDS

diesel fuel, tyre pyrolysis oil, hydrocarbon, hydrocarbon, carbon monoxide

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