

ENVIRONMENTAL EFFECT OF USING DIESEL ON WASTE PLASTIC OIL FUELED IN DI DIESEL ENGINE

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ABSTRACT

In the world, many countries are continually developing materials and methods for effective utilization of the alternative fuel resources available in their region. On the other hand waste plastic poses very serious ecological challenges because of their disposal problems in all over the world. The oil obtained by pyrolysis of waste plastics can be utilized as a fuel without any change in engine modifications, which results in an increase the emissions like carbon monoxide (CO) and oxides of nitrogen (NO_x) and unburned hydrocarbons (UBHC) compared with diesel. This paper deals with the blending of waste plastic oil (WPO) with diesel in two different constituents, namely WPO 90 % and diesel 10 % (PD10) and WPO 80 % and diesel 20 % (PD20). Diesel engine characteristics such as combustion, performance, and emission have been evaluated for different load conditions and compared with the results with that of diesel, WPO and its blends. The experimental results indicated that the brake thermal efficiency (BTE) of WPO-diesel blends at full load conditions is higher as compared to that of WPO. The BTE increased by about 1.31% with PD20 operation at full load compared to WPO. Exhaust gas temperature (EGT) decreased by 5°C in PD20. NO_x and UBHC emission was decreased with increase in the percentage of diesel in WPO blends. CO and Smoke emission decreased by 0.04 % and 2.1 % in the case of PD20 compared to WPO at full load condition respectively.

KEYWORDS: Diesel Engine, Emission, Performance, Pyrolysis Process, Waste Plastic Oil

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