

DEGRADATION OF HDPE WASTE PLASTIC FRACTIONS AS DI DIESEL ENGINE FUEL

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ABSTRACT

Degradation of HDPE waste plastic by using fly ash as the catalyst with cat/pol ratio of 0.1 gives 60.4 % of the plastic oil. The plastic oil obtained has been separated into four fractions with boiling range less than 100 °C, 100 – 150 °C, 150 – 200 °C and above 200 °C. The yields of various fractions based on the weight of waste plastics are 6.9%, 25.6%, 23.6% and 2.5%. The properties of various fractions boiling above 100 are comparable to those of diesel and the fractions are tested in a diesel engine. The brake thermal efficiency is higher for all the fractions. The smoke density is low for all the fractions. Though NO_x and HC emissions are higher for all the fractions when compared to diesel they are within permissible limits. Hence, these can be used successfully as the substitute for diesel.

KEYWORDS: HDPE, Diesel Engine, Emission, Degradation, Plastic Oil Properties