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PERFORMANCE OF COMPRESSION IGNITION ENGINE WITH INDIGENOUS CASTOR OIL BIO DIESEL IN PAKISTAN

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Abstract:

Castor oil available indigenously in Pakistan was converted successfully to bio diesel and blended to 10% quantity (by volume) with high speed mineral diesel (HSD) fuel. This fuel was tested in a compression-ignition engine in order to assess its environmental emissions as well as engine performance parameters. The blended fuel was found to give lower environmental emissions in most accounts except for higher CO₂ and higher NO_x. In addition, three engine performance parameters were assessed, which were engine brake power, engine torque and exhaust temperature. In the first two cases, blended bio diesel fuel gave lower figures than pure mineral diesel due to lower calorific value. However, its higher flash point resulted in higher engine exhaust temperatures than pure mineral diesel. Overall, in terms of engine performance, castor oil bio diesel (from nonedible oil of castor bean – growing on marginal lands of Pakistan) fared better in comparison to canola oil bio diesel (from expensive edible oil) and can be recommended for further tests at higher blend ratios.

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