INVESTIGATIONS ON THE PERFORMANCE AND EXHAUST EMISSIONS OF A DIESEL ENGINE USING PREHEATED MADHUCA INDICA OIL AS FUEL

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ABSTRACT

The concerns about clean environment and high oil prices are the driving forces for the research on alternative fuels. The research efforts directed towards improving the performance of Compression Ignition engines using edible oil or nonedible oil as fuel. This paper deals with the performance of a four stroke, single cylinder C.I. engine fueled by the preheated (30^0C to $135^{0)}$ edible Madhuca Indica oil. The performance of the engine and emission evaluation was studied for a high speed, with the engine operated at 75% of full load and at full load conditions. The performance parameters were considered for comparing are variationof Crank Angle (CA), specific fuel consumption, brake thermal efficiency, brake power, NOx emissions of the engine. It is observed that the engine offers higher thermal efficiency when it is powered by preheated Madhuca Indica oil at higher speed rather than powered by unpreheated oil and the obtained thermal efficiency is little closer to the thermal effficiency obtained with diesel alone. The emission of NOx was due to peak flame temperature of the combustion. The fuel developed the peak flame temperature less than diesel and producing low NOx. Since the advanced injection timing must have effect on increase in peak flame temperature at high loads with the engine is also at hot working temperature.