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Performance and Emission Characteristics of a Diesel Engine using Preheated Cashew Nut Shell Liquid (CNSL)-Diesel Blend

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Abstract : Cashew nut shell liquid (CNSL) is biomass based fuel produced from raw waste cashew nut by pyrolysis process and it has been considered as an alternative fuel for diesel engine. In this work, the performance emission and combustion characteristics of a diesel engine with preheated 20% CNSL-diesel blend (B20) in a single cylinder four stroke direct injection diesel engine was investigated. The CNSL blend was heated to a temperature of 50°C, 70°C and 90°C separately and supplied to the fuel tank to run the diesel engine with different loads. The results showed that the preheating of CNSL lowered the viscosity and provided the smooth fuel flow into the engine. The brake thermal efficiency was increased by about 0.9 %, 2.2% and 2.8% for 50 °C, 70°C and 90°C respectively at full load. The carbon monoxide and smoke emissions were decreased drastically for the preheated CNSL-diesel blend at full load. The NO emissions were slightly increased at full load compared with unheated CNSL blend at full load.

Key words: Cashew nut shell liquid, preheating, performance, emission, pyrolysis.

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