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Effect of Injection Pressure and Fuel Injection Timing on Emission and Performance Characteristics of Karanja Biodiesel and its Blends in CI Engine

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Abstract : In the present of high energy consumption in every sphere of life, renewable energy sources are emerging as alternative to conventional fuels for energy security, mitigating green house gas emission and climate change. There has been a world wide interest in searching for alternatives to petroleum derived fuels due to their depletion as well as due to the concern for the environment. Vegetable oils have capability to solve this problem because they are renewable and lead to reduction in environmental pollution. But high smoke emission and lower thermal efficiency are the main problems associated with the use of neat vegetable oils in diesel engines. In the present work, performance, combustion and emission characteristics of CI engine fuelled with 20% by vol. methyl esters mixed with Karanja seed Oil, and Fuel injection pressures of 200 bar and 240 bar, injection timings (21°,23° and 25° BTDC) and Proportion B20 diesel respectively. Vegetable oils have capability to solve this problem because they are renewable and lead to reduction in environmental pollution. But, high smoke emission and lower thermal efficiency are the main problems associated with the use of neat vegetable oils in diesel engines. In the present work, performance, combustion and emission characteristics of CI engine fuelled with 20% by vol. methyl esters mixed with Karanja seed Oil, and Fuel injection pressures of 200 bar and 240 bar ,Injection timings (21°,23° and 25° BTDC) and Proportion B20 diesel respectively. Various performance, combustion and emission characteristics such as thermal efficiency, and brake specific fuel consumption, maximum cylinder pressure, instantaneous heat release, cumulative heat release with respect to crank angle, ignition lag, combustion duration, HC, NOx, CO, exhaust temperature and smoke intensity were measured.

Keywords : karanja oil, injection pressure, injection timing, karanja oil methyl ester
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