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COMBUSTION ANALYSIS OF MAHUA, HONNE AND CASTOR BASED BIODIESEL AS FUEL IN CI ENGINE

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Abstract

Non-edible filtered Mahua (Madhuca longifolia), Honne (Calophyllum inophyllum) and castor (Ricinus communis) oil based mono esters (biodiesel) and their blends with diesel were tested for their use as substitute fuels of diesel engines. The objective of this study was to analyze and compare the suitability of each of these fuels for engine application from the point of view of normal combustion systems. Diesel, neat biodiesel from Mahua, Honne and Castor oil, and their blends (20 and 60 by v%) were used for conducting combustion tests at varying loads (0, 20, 40, 60, 80 and 100%). The engine combustion parameters such as peak pressure, time of occurrence of peak pressure, heat release rate and ignition delay were computed. Combustion analysis revealed that neat Mahua biodiesel that results in maximum peak cylinder pressure was the optimum fuel blend. The ignition delays were consistently shorter for neat Honne biodiesel, varying between 4.82 and 9.66 crank angles lower than diesel with the difference increasing with the load. Similarly, ignition delays were shorter for neat Mahua and Castor oil biodiesel when compared with diesel. The present analysis reveals that biodiesel from Mahua, Honne and Castor oil is quite suitable as an alternative fuel to diesel engine.

Keywords: Combustion parameters, Non edible oils, Biofuels,