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Experimental Investigation of Cotton Seed Bio Diesel for Various Compression Ratios on Single Cylinder Diesel Engine

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ABSTRACT: Diesel is the major source for transportation and power generation but burning of diesel causes production of dangerous emissions which results to causes of air pollution and also diesel becoming abundant. So there is greater demand for an alternative to diesel. The vegetable oils are rich in hydro carbons. So the researches are found several bio diesels. But straight bio diesels are not used for investigation due to high viscosity low volatility. In the present work neat cotton seed oil is converted into their respective methyl ester of cotton seed by transesterfication process. Experimental investigation was carried out to compare performance and emission analysis for several blends such as (CBD20, CBD40, CBD60, CBD80 and CBD100) with diesel on single cylinder four stroke variable compression ratios diesel engine. Study is conducted at different compression ratios (CR15, CR16.5, and CR18) and loads (for 25% load interval). The performance and emission results are compared with baseline test results. For standard compression ratio at full load of the engine cotton biodiesel with 20% blend (CBD20) shows optimum results. The emissions of CO2, CO were reduced gradually.

KEYWORDS: Biodiesel, Methyl Ester of Cotton Seed Oil, Performance, Emission, Combustion.

I. INTRODUCTION

Diesel fuel has an essential function in the industrial economy of a developing country and used for transport of industrial and agricultural goods and operation of diesel tractors and pump sets in agricultural sector. Because of the reduction of petroleum of reserves and air pollution emerged from exhaust emissions like CO_2,CO,NO_x and Total Hydro Carbon, there have been great efforts to use alternative fuels in diesel engines for substitution diesel fuel. As far as India is concerned because of its vast agro forestry base, fuels of bio origin can be considered to be ideal alternative renewable fuels to run the internal combustion engines. Vegetable oils like soybean oil, castor oil, rapeseed oil and Jatropha curcas oil from plants like both edible, non-edible and methyl esters (Biodiesel) are used as an alternate source for diesel fuel. Biodiesel was found to be the best alternate fuel, technically, environmentally acceptable, economically competitive and easily available.Biodiesel is the latest alternate fuel which is used in countries like India, for the purpose of pollution free and renewable, nontoxic, biodegradable and environment friendly fuel which can be obtained from vegetable oils and animal fats. It can be used in all types of compression ignition engines directly or in the blended form. The engine run by biodiesel exhibits the reduced amount of pollutant gasses such as soot, THC, CO2,