

A Review On Investigation of Performance Characteristics and Emission of a Single Cylinder Variable Compression Four Stroke S.I.Engine Fueled with Blend of Petrol,Ethanol and Butanol

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ABSTRACT

Increasing global concern due to air pollution and to the limited oil reserves has generated much interest in the environmental friendly fuels alternative to petroleum based fuels, in particular for the transport sector in which the energy consumption depends almost exclusively on fossil fuels. Thus this experiment will performed on blending of Butanol with gasoline for saving of fuel consumption. This work compares the performance and emission from a production of 4-stroke single cylinder variable compression S.I engine. The performance parameters will investigate were torque,brake mean effective pressure, brake power, specific fuel consumption and thermal efficiency determine and exhaust emission such as carbon monoxide(CO),carbon dioxide(CO₂),hydrocarbon(HC) and oxides of nitrogen (NO_x) are also measured.

Keywords: *Blending fuel, Ethanol, Butanol, Alcohol*

1. INTRODUCTION

Internal combustion engine are the major environmental pollution contributor due to the exhaust emission it include carbon monoxide, carbon dioxide, nitrogen oxide and hydrocarbon and smoke in exhaust. Also fuel resources are not going to be around forever and their extinction is nearly unavoidable with ever increasing consumption. Fossil Fuel are not renewable in nature, Currently the consumption of fossil fuel is very much time faster than natural production around the world.The energy crisis and environmental pollution created an incentive to study and evaluate alcohols as a fuel in spark ignition engines with the increasing concern of environmental degradation and energy shortage, bio-fuels have obtained steady growth during the last decade due to their renewability and the potential of pollutant reduction. Thus many people have started considering the option of an alternative fuel over petroleum or diesel. Also the Cost of fuels increasing day by day thus for reducing it and reducing the depletion of fossil fuels and environmental pollution alternative fuel is the best option.

2. LITERATURE REVIEW

Aman Hira et.al.[1] carried out the performance & emission characteristics on the CI engine using blends of ethanol and biodiesel with diesel. The experimental study is carried out with used of ethanol as blend in CI engine.The results of study concludes that the used of ethanol blend in CI engine consumes minimum amount of fuel.

Mr.Hirenkumar M Patel et.al.[2] investigated the research on performance testing of single cylinder with Pyrolysis oil diesel blends with ethanol. The test is carried out with different percentages of blend fuel. The results of study conclude that the used of ethanol minimize the fuel consumption.

Yanju Wei et.al.[3]carried out the work for finding out effects of Methanol/Gasoline Blends on a SI Engine performance and emissions. The experimental results of study show that the engine power,torque ratio under the wide open throttle condition mainly depends on the amount of heat delivered to the engine. The addition of methanol considerably improves the brake thermal efficiency, while the methanol/gasoline ratio has a slight effect on it. Engine out CO and NO_x emissions decrease with the boost of the methanol/gasoline ratio.

Xyradakis et.al.[4] carried out the works on the emission characteristics of SI engine operating on pure and high alcohol blended gasoline fuels.The results of this study shows that levels hydrocarbon and carbon oxide is minimum with alcohol blend.

Lalit Kumar Daheriya et.al. [5] presented the review on the effect of performance and emission on DI engine with ethanol blending. In this study the different review were presented for studying the performance of diesel engine.

Farha Tabassum Ansari et.al.[6]carried out investigation on the ethanol blend gasoline in SI engine.The different blend ratios are used for determine the performance of SI engine with ethanol blends.The results concluded that the emission of HC and CO minimized with used ethanol as blend.

K.Manikandan [7] studied the performance and effect on compression ratios on exhaust emission with ethanol gasoline blends.The different concentration of blends is analyzed with two compression ratios of 6:1 and 8:1.The results concluded that the increase of ethanol blending allows the engine to operate at higher compression ratio without knock occurrence.

B.V. Lande [8] investigated on the experimental analysis on two stroke SI engine with ethanol and gasoline blend. The used ethanol as blend improves the quality of fuel and also emission is of HC and CO is minimum.

Simona Silvia Merola et.el. [9] Experimental investigations of butanol-gasoline blends effects on the combustion process in a SI engine. The effect on the spark ignition combustion process of 20% and 40% of n-butanol blended in volume with pure gasoline was investigated through cycle-resolved visualization.

Mahdi Shahbakhti et.el. [10] Combustion characteristics of Butanol/n-Heptane blend fuels in an HCCI engine. Application of alternative fuels in high-efficiency combustion modes offers the potential to reduce demand for petroleum resources.

Mridul Gautam and Daniel W. Martin II. [11] Combustion Characteristics Of Higher Alcohol/Gasoline Blends. Lower alcohols such as methanol and ethanol have been used in the past as fuel extenders by mixing them with gasoline, but relatively little work has been reported on higher alcohols such as propanol, butanol, and pentanol.

Mr. Hitesh B. Bisen, Mr. Y. R. Suple [12] Experimental Investigations of Exhaust Emissions of four Stroke SI Engine by using direct injection of LPG and its analysis. Gaseous fuels such as liquefied petroleum gas (LPG) and liquefied natural gas (LNG) have been widely used in commercial vehicles.

3. CONCLUSION

This research discussed about the different literature based on the blending of gasoline along with ethanol and butanol. The different researches are widely investigated about the different types blends agent in base fuel. A number of studies have been agreed in order to study the effect of various parameters on SI engine with used ethanol and butanol blends. The performance parameters will investigate were torque,brake mean effective pressure, brake power, specific fuel consumption and thermal efficiency determine and exhaust emission such as carbon monoxide(CO),carbon dioxide(CO₂),hydrocarbon(HC) and oxides of nitrogen (NO_x) are also measured.

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