

Experimental Analysis of Hydroxyl Gas(Hho) in Petrol Engine-A Review

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Abstract— Now a day our world is severely affected by energy crisis and Global warming. So we came up with an idea of decreasing the vehicle’s emission and increasing the fuel economy of a vehicle. Our bike is fitted with a HHO kit to give more power with increases in fuel economy. We have manufactured our mini bike with two seated capacity. Our main motto of the team is to design a HHO kit and it gives good fuel economy. It is made to attain 80km/hr and gives fuel efficiency of 62km in two stroke engine. By using electrolysis process, the hydroxyl gas is produced from ordinary water. The HHO or BROWN gas produced is given to the engine combined with air –fuel (petrol) the power as well as mileage of the vehicle is increased. The CO₂ emissions are greatly reduced in our bike.

Key words: Water, Nichrome wire, Electrolysis process, Battery, Switch, Emission characteristics, Performance characteristics

I. INTRODUCTION

A. “Hydroxyl Gas (Hho) Based Bike”

The precious and quick depleting non-renewable energy resource “petrol” can be save by substituting “hydroxyl gas” in petrol engine. The project work executes a hydroxyl gas producing unit that can be used with petrol engines to decrease petrol consumption. This substitutes the petrol up to 20% and increases the engine thermal efficiency and reduces the fuel consumption.



Fig. 1:

It is simply producible and eco-friendly hydroxyl gas from water, along with petroleum to run the two stroke petrol engine and attain considerable improvement in mileage than conventional fuel. The unit devise, break the water by the method called ‘electrolysis’ with very less electric current to form hydroxyl gas. This hydroxyl gas is used in a good ratio in combustion chamber to burn with petroleum.

The special portable kit to produce hydroxyl gas and it’s mixing during burning in proper ratio to burn with petroleum, has been devised.

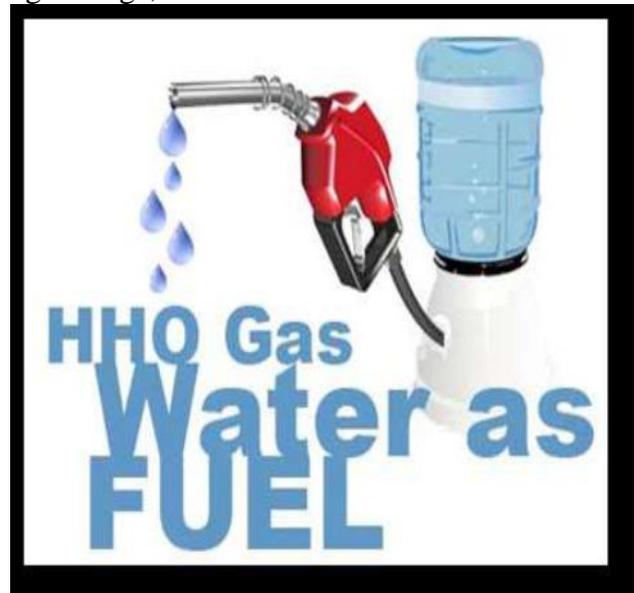


Fig. 2:

The hydrogen explosion is so rapid that it fills the combustion cylinder at least 3 times faster than the gasoline detonation and succeeding ignites the fuel from all directions (it is like putting flue on a fire), instead of the spark in one end of the combustion cylinder, and we would like to do that since the fuel only has a short time in the combustion cylinder and if it’s not fully burnt in that short amount of time then it just goes out the exhaust and is lost. It is also preferable to ignite all of the fuel when it is under highest compression in combustion cylinder to get the maximum amount of power out of it (this is a small time window), whence the piston starts going down the energy transfer from the detonation to the engine becomes less efficient.

Some basics the burn speed of hydrogen is 0.098 to 0.197 ft/min (3 to 6 cm/min) compared fuel’s 0.00656 to 0.0295 ft/min (0.2 to 0.9 cm/min).

The engine performance is found to be improved by 17% compared to conventional fuel. This may be a significant contribution to the automobile industry.

B. Hydroxyl Gas (Hho) Design



Fig. 3:

II. WORKING

The project work developed a hydroxyl gas produce unit that can be used with petrol engines to reduce petrol consumption. These substitute the petrol up to 20% and increase the engine thermal efficiency and also reduce the fuel consumption. It is simply producible and eco-friendly hydroxyl gas from water, along with petroleum to run the two stroke petrol engine and achieve considerable improvement in mileage than conventional fuel. The unit devised breaks the water by the technique called “electrolysis” with very less electric current to form hydroxyl gas. This hydroxyl gas is used in a good ratio in combustion chamber to burn with petroleum in a proper ratio. Here,

Electrolyte – water

Electrode - nichrome wire.

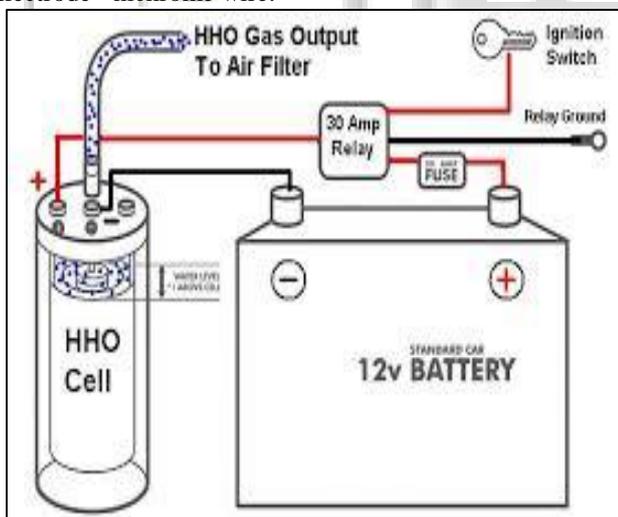


Fig. 4:

III. OBJECTIVES

- The main objectives of this method are reduced fuel consumption and CO₂ emissions are greatly reduced in our bike.
- Other objectives include optimum fuel, air mixing and intake of manifold hydroxyl gas ratios.

- Objectives include optimum performance of the combustion chamber Characteristics and best emission test characteristics.

IV. LITERATURE SURVEY

Mohammed et al. [1] the objective of this work was to construct a simple innovative HHO invention system and evaluate the effect of hydroxyl gas HHO adding, as an engine performance improver, into petrol fuel on engine performance and emissions. The concentration of NO_x, CO and HC gases has been reduced to almost 15%, 18% and 14% respectively on standard when HHO is introduced into the system.

Mithun Dabur et al. [2] had discussed the fuel consumption rate but also enhance the performance of vehicle. Fuel consumption rate decreases. CO drops a extremely high percentage with respect to oxygen. Lower noise and reduce vibrations in the engine. Performance of engine and control of emission. The concentration of emission such as NO_x, CO and HC gases has been reduced.

Ammar et al. [3] had discussed in this paper. Brown’s gas (HHO) has been recently introduced to the auto industry as a new source of energy. The present work propose the design of a new device attached to the engine to add an HHO production system with the gasoline engine. Eventually, the goals of the integration of 20–30% reduction in fuel consumption, lower exhaust temperature, and consequently a reduction in pollution.

Mustafa et al. [4] had discussed to compare performance and emission characteristics of a pilot injection diesel engine with the accompaniments of option fuel like pure hydrogen, HHO and biodiesel. Exhaust emission values (NO_x, CO₂, CO) were investigated in engine speed. Effects of H₂ and HHO to performance and emissions of a Petrol engine are examined. Engine performance values were increased.

Karthi et al. [5] the manufacturers claims that their system showed various percentage of mileage improvement. This paper for green transportation focuses in developing the standardized system with proper control over fuel consumption and emission. A more green-conscious society can be achieved through the request of green technology to public transportation.

Durairaja et al. [6] the increasing industrialization of the world has led the need of fuel. Fossile fuels are obtained from limited reserves. These finite treasuries are highly concerted in certain region of the world. The use of water powered biodiesel in conservative engines result in substantial decrease in emission of unburned hydrocarbons, carbon monoxide and particulate. Also these pre heats of the air improve the thermal efficiency and reduce the vibration of the engine.

Ali Can Yilmaz et al. [7] its effects on exhaust emissions and engine presentation characteristics were investigated. Experiments showed that steady HHO flow rate at low engine speeds. It was observed that if the molalities of NaOH in solution exceed 1% by mass, electrical current supplied from the battery. HHO system addition to the engine without any modification resulted in rising engine torque output by an standard of 19.1%, reducing CO emissions by an average of 13.5%, HC

emissions by a standard of 5% and SFC by an average of 14%.

Keyur D. Patel et al. [8] there is option to run 4-STOKE petrol engine on biogas but the burning is poor as compared to petrol fuel. One of the reasons of unfortunate combustion is the presence of carbon dioxide in the biogas. Hydrogen is added in small amounts by HHO GENERATOR (HYDROXY) KIT to decrease focus of CO₂ in biogas on the energy base and tested in a spark ignition engine at different range of brake power, with little change in injection of the engine. Emission test show that in petrol the proportion of HC and CO emission is upper and CO₂ emission is lower compare to biogas engine at same brake power.

V. CONCLUSION

The process of designing a vehicle and HHO (GAS) is not a easy task; as a matter of fact it takes a lot of effort from all members of the team to attain a successful design.

The multidisciplinary gain of this project is what make it successful and certainly an experience to remember for the rest of your life.

After the enumeration of performance and emission analysis we come to the following conclusion.

- Fuel consumption rate decreases.
- Increases the power and performance in your bike. The more fuel you burn, the more the engine get rattled up and wrecked.
- Reduce the CO₂ emissions. Eliminate pollution and other harmful residues that our petrol engines produce.
- Increase mileage by 20% up to 30%, without engine modification.
- Sudden pickup in our bike.

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