

Increasing Efficiency and Pollution Reduction in Gasoline Engine By Using H-Ho Gas Mixture

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Abstract

Reducing the emission pollution related to oil combustion is gaining associate in nursing is increase interest worldwide. Recently, Brown's gas (HHO gas) has been introduced as an alternate clean supply of energy. A system to get HHO gas has been engineered and integrated with four stroke engines. The results show that a combination of HHO, air, associate in nursing gasoline cause a discount within the concentration of emission waste constituents and an improvement in engine potency. The emission tests are through with varied the engine speed. The results show that chemical element oxide (NO) and chemical element oxides (NOX) are reduced to regarding five hundredth once a combination of HHO, air, and fuel was used. Moreover, the carbon monoxide gas concentration has been reduced to regarding 2 hundredth. Also, a discount in fuel consumption has been detected and it ranges between 2 hundredth and half-hour.

Keywords : Fuel, Engine, HHO

1. Introduction

A electric cell may be a device that uses H (or hydrogen-rich fuel) associated gas to form electricity by an chemistry method. One electric cell consists of associate solution sandwiched between two skinny electrodes. Hydrogen, or a hydrogen-rich fuel, is fed to the anode wherever a catalyst separates hydrogen's charged electrons from charged ions (protons). At the cathode, gas combines with electrons and, in some cases, with species like protons or water, leading to water or hydroxide ions, severally. The electrons from the anode aspect of the cell cannot submit to the membrane to the charged cathode; they have to travel around it via an electric circuit to achieve the opposite aspect of the cell. Still, one electric cell produces enough electricity for under the littlest applications. Therefore, individual electric cells square measure usually combined serial into a fuel cell stack. A typical electric cell stack might carries with it many fuel cells. Fuel cells square measure classified primarily by the sort of solution they use. This determines the sort of chemical reactions that manifest itself within the cell, the sort of catalysts needed, the temperature place that the cell operates, the fuel needed, and alternative factors. There square measure many styles of fuel cells presently underneath development, every with its own benefits, limitations, and potential applications.

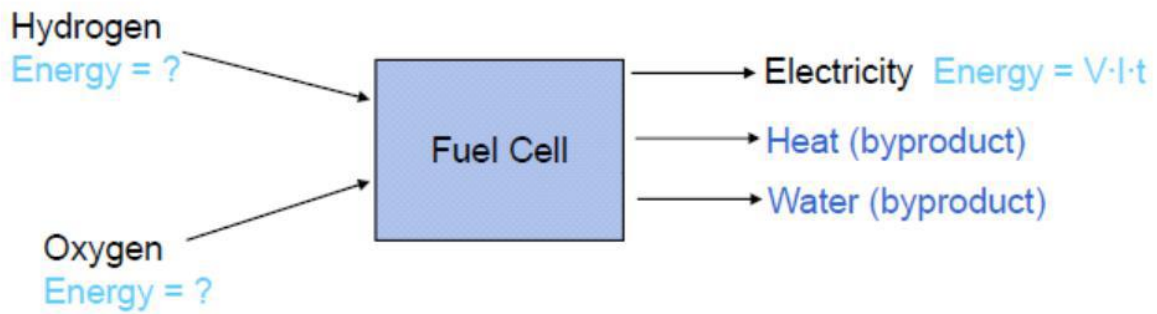


Figure 1.1 Layout of Fuel Cell

Vehicles have become one of the most important parts in our day-to-day life. The forms of vehicles used are based on their life style, status, work, etc., by using these vehicles we are facing air pollution in our day-to-day life. Because of the pollutant contents emitted from the exhaust gas. These gases will pollute the environment.

The pollutants such as

- Carbon monoxide
- Sulphur di oxide
- Oxides of nitrogen
- Nitrogen oxide

2. Experimental Details

2.1 Engine

In most gasoline engines, the fuel and air area unit sometimes mixed when compression (although some trendy gasoline engines currently use cylinder-direct gasoline injection). The pre-mixing was at one time worn out a mechanical device, however currently it's done by electronically controlled fuel injection system, except in little engines wherever the cost/complication of natural philosophy doesn't justify the side engine potency. The methodology differs from a diesel motor within the method of blending the fuel and air, and in victimisation spark plugs to initiate the combustion method. During a diesel motor, solely air is compressed (and so heated)

Table 2.1 Hero Honda Four Stroke Petrol Engine Specification

Type	Four stroke engine
Cooling System	Air Cooled
Bore/Stroke	50 x 50 mm
Piston Displacement	98.2 cc
Compression Ratio	6.6: 1
Maximum Torque	7.95 Nm at 5000RPM



Figure 2.1 Engine Setup

2.2 Frame:

A structure is called a **frame** if at least one of its individual members is a multi-force member. A multi-force member is defined as one with three or more forces acting on it, or one with two or more forces and one or more couples acting on it.

2.3 Fuel Tank

A fuel tank (or gasolinetank) may be sage instrumentation for inflammable fluids. Though any tank for fuel is also thus referred to as, the term is usually applied to a part of AN engine system during which the fuel is hold on ANd propelled (fuel pump) or discharged (pressurized gas) into an engine.

2.4 Electrolysis Setup

An **electrolyte** is a substance that produces an electrically conducting solution when dissolved in a polar solvent, such as water. The dissolved electrolyte separates into cations and anions, which disperse uniformly through the solvent. The movement of anions and cations in opposite directions within the solution amounts to a current.



Fig. 2.2 ElectrolyteELECTRODE:

An electrode in an electrochemical cell is referred to as either an *anode* or a *cathode*. The anode is now defined as the electrode at which electrons leave the cell and oxidation occurs (indicated by a minus symbol, “-“), and the cathode as the electrode at which electrons enter the cell and reduction occurs Fig. 2.2 Electrode

2.5 CATALYST - KOH



Figure 2.3 Catalyst - KOH

In general, the reactions occur faster with a catalyst because they require less activation energy. In catalyzed mechanisms, the catalyst usually reacts to form a temporary intermediate which then regenerates the original catalyst in a cyclic process

3. Result and Discussion

The hydrogen gas is produced by mixing the KOH and water with the help of cathode and anode terminals. The 12-volt battery supply is given to these electrodes, so that the hydrogen is comes out from the negative terminal tank. This output gas is dipped to the water tank so that hydrogen is produced. This is explained in the above chapter. Here's some information on a simple home-grown method for producing pure hydrogen gas. The beauty of this system is that it uses a common inexpensive chemical which is not consumed in the reaction, so it can be used again and again almost indefinitely (if you use pure water in the reaction). The chemical is Potassium

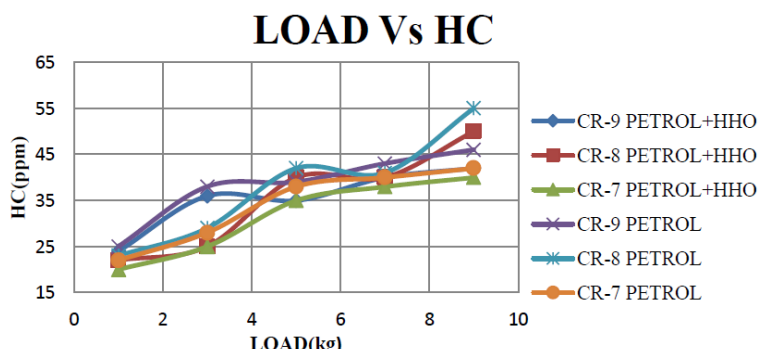


Figure 3.1 Load Vs HC

hydroxide, commonly called caustic potash. Its chemical formula is KOH, and its used to manufacture soaps, dyes, alkaline batteries, adhesives, fertilizers, drain pipe cleaners, asphalt emulsions, and purifying industrial gases.

Table 2 Petrol Vs Blended Hydrogen Gas

POLLUTANTS	PETROL LOAD 1	BLENDED HYDROGEN GAS LOAD 1	PETROL LOAD 2	BLENDED HYDROGEN GAS LOAD 2
O ₂	10.9	15.4	6.7	17.2
CO	5.746	0.807	8.649	1.047
NO	35	12	35	7
NO _x	32	10	32	6

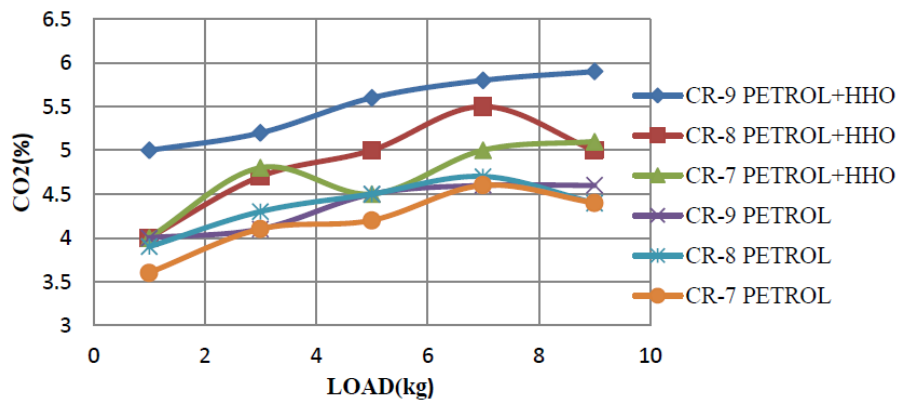


Figure 3.2 Graph for load vs CO2

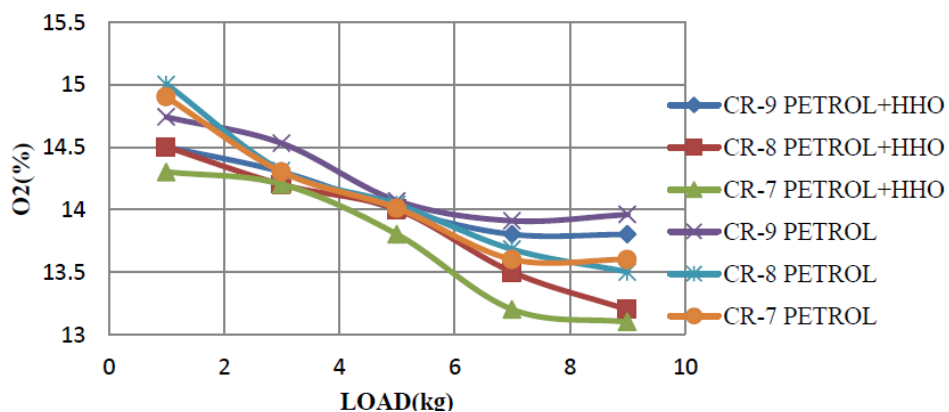


Figure 3.3 Graph for load vs O2

4. Conclusion

The increasing potency and pollution reduction in internal-combustion engine using H-HO gas mixture is functioning with satisfactory conditions and able to perceive the difficulties in maintaining the tolerances and conjointly quality. The remarks of our project work, have developed a “increasing potency and pollution reduction in internal-combustion engine victimisation H-HO gas mixture” that helps to grasp a way to attain low fuel value to run the vehicle.

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