

The Brown's Gas Application and limitation :A Review

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Abstract:-In now a days there are so many types of fuel which are being used in various automobile and industries uses. Brown gas can be use as a supplement of all the fuels due to its advantages over the traditional fuels. Brown gas, is the new kind of combustible gas which is 100% pollution free fulfill all the criteria of fuel according to the environment laws. it is very efficient, clean and powerful gas which can use in many applications as fuel or by mixing of fuel in it. it can generated by electrolyze, which uses electricity to split water into its elements.

Keywords: Alkaline Electrolysis, HHO generator, Combustion Efficiency,Electrical Power Generation, Energy Storage.

I. INTRODUCTION

The necessity of fuel is increasing day by day. Fuel is limited and it will not last for 50 years from now. Fuel is any material that stores chemical energy in a form that can be released and used as heat energy. The study other source of energy is very critical and booming area for research. Electrical energy by wind , tidel , solar, and fuel from bio mass are the improving continusly for meeting the requirement. The heat energy released by many fuels is harnessed into mechanical energy via an engine. Fuels are also used in the cells of organisms in a process known as cellular respiration. Hydrocarbons are by far the most common source of fuel used by humans.^[1]

	Primary (natural)	Secondary (artificial)
Solid fuels	wood, coal, peat, dung, etc.	coke, charcoal
Liquid fuels	petroleum	diesel, gasoline, kerosene, LPG, coal tar, naptha, ethanol
Gaseous fuels	natural gas	hydrogen, propane, coal gas, water gas, blast furnace gas, coke oven gas, CNG

Figure.1 General type of chemical fuels^[1]

II. WHAT IS BROWN'S GAS?

Brown's Gas states that it is a mixture of its constituent's Di-atomic and mono-atomic hydrogen and oxygen. The simple way to generate this gas is use an electrolyzer .it pass high amount of current in the mixture of water and electrolyte .it is an simple electrolysis process which convert this mixture into its gas. This gas is mixture of Di-atomic and mono atomic which has sub part like H₂O and HHO. It has a cool flame about 130 degrees yet is able to melt steel, brick and many other metals.

Browns-gas refers to a process discovered by a Bulgarian born Dr. Yule Brown. He conclude that a heavy water can be split up using low voltage causing it to become 66.6 percent hydrogen to 33.3 percent oxygen and then it can be returned back to being water by giving large amount heat by chemical reaction. It can be assume that Browns gas has capability to replace petroleum fuel as a free clean energy source due to its characteristics. A discovery that is considered to be a future replacement for petroleum fuels that can also be used to weld anything to anything and transmute nuclear waste into becoming non nuclear. ^[2]

III. GENERATION OF BROWN'S GAS

HHO is created by an electrolyzer/ HHO generator, cell, or unit through the process of electrolysis which is explained below.

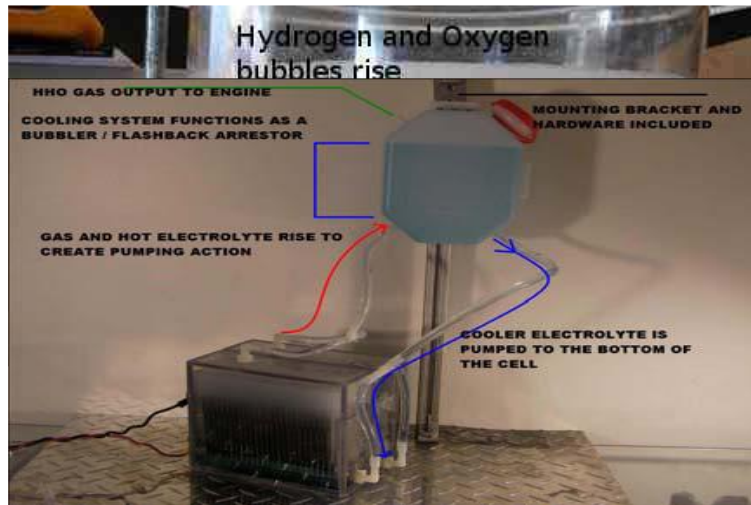


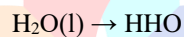
Figure2. Electrolyzes with BG Fumes^[2]

Figure3. Electrolyzes circulation^[2]

The small white cloud is actually split hydrogen and oxygen bubbles that have come to the surface. The HHO gas bubbles and then rises to where it is sucked into the engine.

IV. Electrolysis of water

One important use of electrolysis of water is to produce hydrogen.



Electrolysis of water can be done by passing direct current from a battery or other DC power supply in heavy water (in practice a salt water solution increases the reaction intensity making it easier to observe). Metal electrodes could be used, hydrogen gas will be seen to bubble up at the cathode, and oxygen will bubble at the anode. If metals are used as the anode, there is a chance that the oxygen will react with the anode instead of being released as a gas, or that the anode will dissolve. When producing large quantities of hydrogen, the use of reactive metal electrodes can significantly contaminate the electrolytic cell For that carbon made electrode are the best option or stainless steel also can be used. ^[2]

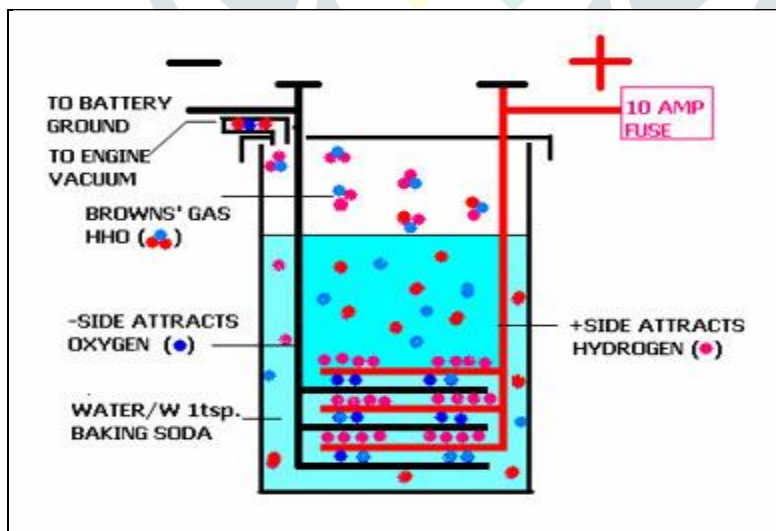


Figure 4. Electrolysis^[2]

The brown gas generator itself is usually quite simple, with two “electrodes” (Metal rods extending into water) with plates, washers, or parallel metal sheets are used, that conduct electricity through the water and cause the hydrogen and oxygen to expand its molecular structure and rise to the surface.

V. USE OF ELECTRLYTE:

Potassium hydroxide or sodium hydroxide (NaOH) baking soda can be used to make reaction and process easier. This will make 66% hydrogen gas, 30% carbon monoxide and 4% carbon dioxide. The carbon in the baking soda react with the oxygen to form the carbon monoxide and carbon dioxide. The carbon also poisons the catalytic capabilities of stainless steel. Salt is also most unsuitable as is battery acid. Stick with KOH as it is easily the best with NaOH coming a close second. Nacl is also can be added.

VI. ADVANTAGE

6.1 Advantages of the HHO Technology for Automobile

- It can Save up to 30% in your actual fuel spending it it combined with fossiel fuel in engine.
- Increases the power and performance of your vehicle due to the high charactristics of buring.
- Reduces the CO₂ emissions because the main elements are hydrogen and oxygen.
- It helps to Removes the carbon in motor and prevent future carbon build up due to complete combustion.
- Better performance and Lower noise in the engine.
- Increases the life span of engine.

6.2 Advantages of the HHO Technology for Welding and Gas cutting

- All fuel types, including gasoline, LPG, hydrocarbon, diesel fuel and natural gas have constant combustion point or burn temperatures where as Brown's Gas flame, upon application to an element or compound of elements, changes its temperature due to an interactive property. This is the unique characteristic of Brown's Gas.
- The salient features of this combustion process are that nascent hydrogen is readily converted into pure water.
- The efficiency of conversion of energy is very high. DC power conversion efficiency to thermal energy is 95%. AC to DC conversion is 98%; so the maximum efficiency of the gas production from AC supply is 91.3%. A best factor of this system is its ability to produce gas immediately and cheaply on demand as required. The neutral flame of the gas is important for welding and also as a clean heat source of energy capable of replacing fossil fuels.
- Brown's Gas flame is much more resistant to rust and corrosion.
- BG Flame cones are long, allowing the torch to be held farther away from the work. This results in virtually no torch cleaning maintenance or tip damage.
- BG Flame cuts iron much faster than any other gasoline method.
- BG Flame cuts from 10% to 25% faster with outstanding quality
- Faster, higher quality cuts allow jobs to be finished quicker, No slag or dross.
- No a significant reduction or elimination of oxygen costs.
- BG Flame cuts are straight line cutting
- BG Flame can melt nearly any material on earth included tunguston.
- BG Flame heats material much less than other fuel-gasses during cutting
- less heat hardening compared to other flames . Brown's Gas weighs about 1/2 atmosphere, so is a 'Lighter than Air' gas that does not concentrate to form explosive mixtures.^[5]

6. Comparison

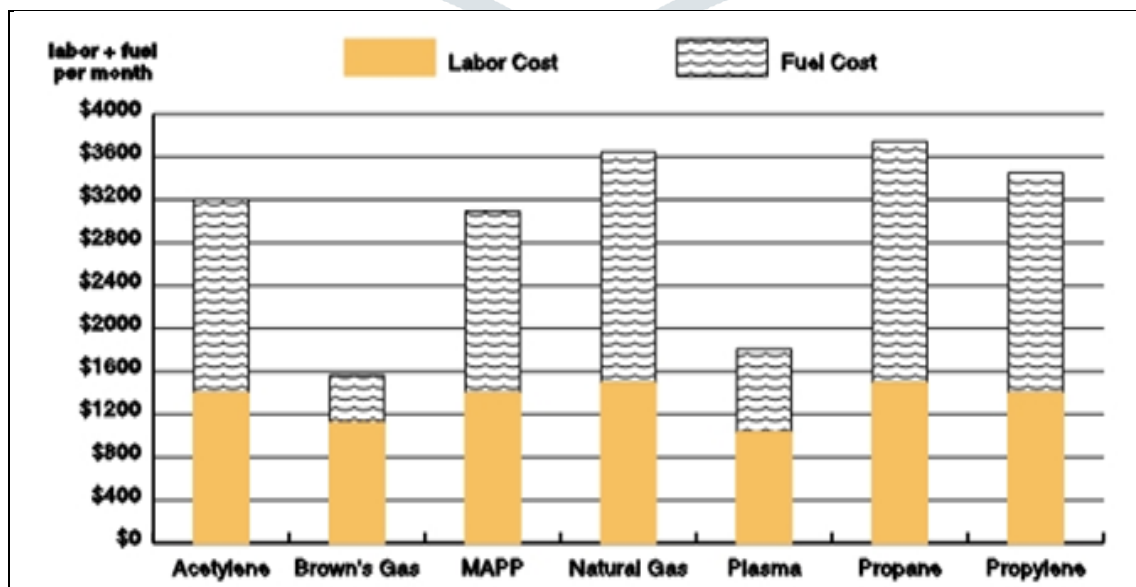


Figure5. Comparison of Brown's Gas and Traditional Cutting Options^[5]

6.3 Some other comparisons criteria

➤ **Reduce Labor Costs**

A company that used acetylene to braze refrigeration pipe had serious health problems to solve. Their employees had headaches, fatigue, nausea, dizzy spells, confusion and irritability. The labor force was ill or quitting. The costs of sick benefits and constantly training new people were exorbitant. By converting to Brown's Gas, fuel costs were reduced by 80%; health and morale improved significantly; productivity as well as the quality of the work was increased.

➤ **Transform Industry**

Brown's Gas increases efficiency and safety in automotive shops. Cutting, brazing, soldering and heating can often be done with the components still in place. In addition, the laser-like flame minimizes the chance of igniting nearby oil, plastic, rubber & fabrics. Emerging Industry: Small Brown's Gas electrolyzers (which cause a huge drop in pollution and fuel consumption, while increasing both performance and engine life), can be added onto customer's vehicles.

➤ **Increase Precision & Profits**

Brown's Gas has been a 'trade secret' in the jewelry industry for over 30 years. Artists use BG because it is the ideal gas for welding noble metals. It produces minimal discoloration which cuts polishing time. The flame's low radiant heat reduces or eliminates masking & metal distortion and the precision of flame allows intricate jewelry to be easily manufactured. Brown's Gas is the gas of choice for creating semi-precious stones like rubies, sapphires & moonstone. Brown's Gas allows delicate work to be done with quartz and glass.^[5]

VII APPLICATION

- pure 'new' water manufacture
- hydrated water for health
- muscle relaxation; pain relief
- help plants germinate and grow
- neutralization of radioactive waste
- creating new industrial materials
- transmutation
- inexpensive toxic waste disposal
- vastly increase recoverable ore
- underwater breathing gas
- super-efficient room heating
- surface treatment of materials
- Use in space
- New breakthroughs in chemistry
- Cheaper and easier welding
- No flux required when welding
- New alloys
- New energy storage or battery types
- Potential fuel
- Breakthroughs in plasma physics
- Comparison of metals or non-metals when using the torch on them
- The burning rate of Browns Gas (Possibilities of proving it is not just diatomic hydrogen and oxygen)
- More research needed in the claims of nuclear radioactivity neutralization
- More research in general, who knows what more could be found

VIII. Conclusion

As the study of brown gas has been seen very useful efficient and economical for the industries uses and domestic propose. All this kind of characteristics which bring down fuel problem at zero level. This gas is harmless to environment or human. As this kind of gas or fuel is very efficient. More studies and experiment can make this valuable gas reach to the fulfilling the need of world energy and make reduce power problem. Besides all this advantage the biggest advantage of this gas that it is 100% pollution less. It make water particle after flaming condensation. as we all know that in now a days we are searching for better fuel better power with no harmful effect to the environment. So by the use of brown gas no carbon Di-oxide, nitrogen oxide carbon mono oxide or sulfur Di-oxide will release and that make this gas very very useful in behalf of environment and human kind surviving.

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