Method for generating Hydrogen or Hydrocarbon gases from water and carbon dioxide using ultra efficient electrolysis.

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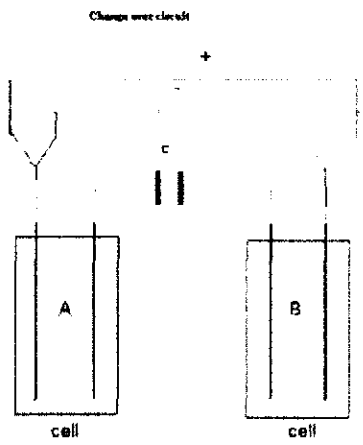

Figure 1

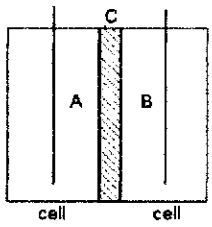

Figure 2

SMD with electron extraction and reuse

Water as is known, is made up of hydrogen and oxygen, H2O, and the simplest form of breaking the water molecule into it's gases components is by electrolysis. Michael Faraday used a simple system of electrolysis to produce hydrogen and oxygen by connecting a DC charge to two electrodes in water. Hydrogen was produced from the negative electrode and oxygen from the positive electrode, and the efficiency of this is known as a Faraday COP of one (100%), albeit 100% is by virtue near impossible to obtain.

In the embodiment of this invention, I will explain how electrolysis can be used with an efficiency of 185% or more, and at the same time produce hydrocarbon gases such as ethane and methane which can be compressed and used in the same way as petroleum gases.

This invention is known as SMD or switch mode drive electrolysis. The system is designed so as electrons which leave the cathode electrode, can be used over again before they are lost in entering the anode, as in normal electrolysis.

In Fig1. Is shown two cells A and B and each has two electrodes. One electrode in each cell is connected to a polarity change over circuit, the other two electrodes are connected to a capacitor.

This diagram as it is will not work, it is only to demonstrate how the system operates. If the electrode in A is negative then the other electrode in A will be negative as well. The same goes for the electrode in cell B if it is positive, the other electrode in B will be positive and so the capacitor C will charge with electrons.

In Fig2. The external capacitor has been removed and instead two other electrodes are positioned between the two main electrodes in the same cell. These two center electrodes are not connected directly to any circuit, as they stand they are neutral between an anode and cathode, and in ordinary electrolysis they will take on there appropriate charge on each side similar to the capacitor shown in Fig1. This has a chain effect only and the electrons are still used only once from leaving the cathode and entering the anode.

By adding the change over polarity circuit of Fig1. To Fig2. And setting the correct frequency of change over, the two neutral plates become a true capacitor of charge and discharge and in so doing, use electrons more than once. In the laboratory under test, an efficiency of 185% has been maintained, of which part can be considered as increase in gas production due to bubble formation on the electrodes being pushed away on polarity change.

All of the above mentioned system was tested with distilled water and an electrolyte such as Na Oh, only for the production of hydrogen and oxygen in a single duct system. This system lends itself to be adapted for the production of hydrocarbon gases from the hydrogen in the water and the addition of carbon dioxide dissolved in the water.

For hydrocarbon gas production, an electrolyte/catalyst is used along with electrodes made of nickel or rhodium plating. The electrolyte used is sodium acetate which was made in the laboratory using sodium hydroxide and acetic acid, this is then added to carbonated water for electrolysis. The carbon dioxide in the carbonated water, is held by the sodium acetate in the form of carbonic acid. In a working cell the carbon dioxide can come from any source and can be passed through the electrolyte water before entering the cell.

When a current is passed through the electrolyte in standard electrolysis, ethane and carbon dioxide amongst others are produced at the anode and hydrogen at the cathode, the creation of ethane is not large due to the small amount of atomic hydrogen at this anode. In this system of polarity change, vast amounts of atomic hydrogen are produced when polarity changes (at frequency), the hydrogen links with the carbon before the carbon links with the oxygen and so forms large amounts of ethane. At the anode carbon dioxide and methyl radicals are formed, on polarity change atomic hydrogen is formed, the following reactions take place

$OH.+CH4 = CH3+H2O$ (methyl radical)
$CH3COO- = CH3+CO2+e-$
$CH3.+.CH3 = C2H6$

On combustion the following takes place:-

$2C2H6+7O2 = 4CO2+6H2O+3170kj$ of energy

Ethane can be used on it's own as a fuel, or it can be converted to methane or ethylene and even ethanol.

This system of what you could call supper electrolysis, is very energy efficient and could be run by using solar or wind power and the gas compressed into cylinders for later use, either in the home for heating, cooking or electric generation. A use also could be for a converted engine to gas inside a

car, such as for LPG, liquid petroleum gas, the uses are indeed endless. This system was not designed for instant point of use, but for compression and storage utilizing free solar and wind energies in down time from instant use.

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