Browns Gas: What exactly is it?

By Chris Eckman

May 1, 2008

Abstract

Brown's Gas, according to a current theory, is a mixture of monatomic and diatomic hydrogen and oxygen and a special form of water called Electrically Expanded Water (EEW) or Santilli Magnecules. Brown's Gas is produced by a similar design of the electrolyzer that will split water into its various components. Browns gas has a plethora of unusual characteristics that seem to defy current chemistry. It has a cool flame about 130 degrees yet is able to melt steel, brick and many other metals. The goal of this paper is to confirm claims of the browns gas and to help solidify the current theory of browns gas. [16]

Note: George Wiseman defines Brown's Gas as: "The entire mixture of gasses evolving from an electrolyzer specifically designed to electrolyze water and not separate the resulting gasses."[16]

Browns gas: the basic claims and current theory

Water is split by electricity to form its various elements, Oxygen and Hydrogen. By the unique design of the electrolyzer it is able to keep a portion of the gas in the form of monatomic Hydrogen and Oxygen (measured between 1% and 3% I can give you references). The Brown's Gas mixture, when lit, will both explode and implode to form water, releasing the energy that is found in the bonds of the two elements in the form of heat. In the mon-atomic portion, ~~N~~o atomic bonds need to be broken (the bonds of the H2 and O2 respectively) before turning back into water. The key difference of browns gas is the fact that some of the Hydrogen and Oxygen never go into a diatomic state, hence Brown's Gas has more energy because these bonds were never made. Further, Brown's Gas contains water in a special structure that Yull Brown called a "fluid crystal", George Wiseman calls Electrically Expanded Water and Professor Santilli calls Santilli Magnecules. This state of water contains an, as yet, unknown quantity of electrical energy that is released when Brown's Gas is burned.

Breaking of the bonds in ~~the~~ diatomic gasses requires energy and the energy comes from the atomic energy of the reaction itself. The potential atomic energy is released in a random fashion if the gas is not channeled (as in a flame). There is so much heat, so fast, there is a violent explosion. Once the explosion has happened, it is followed immediately by an implosion; because the split atoms are monatomic and now combine to form water. Water is the ultimate byproduct and can be seen condensing on a metal plate.

Browns gas can fuse brick, steel, sublimate tungsten, flame is cool, glaze quarts, neutralize nuclear waste, fuse two dissimilar substances and many more things. Brown's Gas burns with a clean flame. It uses no atmospheric oxygen, and creates only pure water as its combustion product. One liter of water produces ~1866 liters of gas. When this gas is ignited, the volume is reduced to the original one liter of water. [16]

"Typical 2H2:O2 behavior, known to everyone. Because 2H2:O2 (diatomic hydrogen and oxygen in stochiometric mixture) needs heat (explosion) to break the atomic bonds between the diatomic hydrogen molecules, turning them into "mon-atomic" atoms, which can then reform into water (implosion). So you get an explosion, then an implosion. It is important to realize that for hydrogen and oxygen to form water, they must be in their mon-atomic or "elemental" form." [21]

"This invention relates to welding, brazing or the like utilizing a mixture of hydrogen and oxygen generated in substantially stoichiometric proportions in an electrolytic cell by electrolytic dissociation of water, the mixture so generated being passed from the generator through a flash-back arrestor and thence to a burner where the gases are ignited. The invention also relates to atomic welding in which the above mentioned mixture is passed through an arc causing dissociation of both the hydrogen and oxygen into atomic hydrogen and oxygen which on recombination generate an intensely hot flame."

A most important application of the invention is atomic welding utilizing the properties of atomic oxygen in combination with atomic hydrogen (for welding) or atomic oxygen separately (for cutting). This particular application of the invention is based, among other things, on the appreciation that considerable energy is associated with the dissociation of molecular oxygen into atomic oxygen by passing this gas through an arc, and that this property can be usefully employed to generate temperatures even higher than those previously attainable with, for example, an atomic hydrogen flame. The significance of the energy which can be obtained in this way can be appreciated from the following reactions that take place, and the heat energies associated therewith, when hydrogen and oxygen are both passed through an electric arc.

The basics are: "The simplest way to make Brown's Gas is to use an electrolyzer, which uses electricity to split water into its elements of hydrogen and oxygen. At the instant that the water splits, the hydrogen and oxygen are in their mon-atomic state, this is H for hydrogen and O for oxygen."[22]

The test

Most of these tests were done with Larry [14] using his ER1600 WaterTorch from Eagle Research. I also had borrowed a home built Browns Gas machine from Lewis Greadwalt who lives in Blackfoot, Idaho. Some of the test equipment was from my personal stash and from college labs.

First test: ***How much energy will it take to ignite the gas?***

The minimum energy required to ignite Browns Gas (in normal atmospheric pressure) is with a spark is with about 0.03 milli-joules. I found that it can go with out a spark, however it takes more energy, if there is a visible spark then it will (99% of the time) ignite. When ignited, the gas mixture converts to water and energy, a calculated energy of around 15KJ of energy per liter.

Second test: ***What is the flame heat?***

The flame heat was around 130 degrees (+ or – 2 degrees). Very cool flame, it proved to be even cooler then commercial electrolyses. I first used a series of thermocouples and put the fire from the torch onto surface and took several readings. The ceramic material heated up rapidly and ended up damaging the thermocoupler. The second test was done in a lab using an InfraCAM SD thermal imaging storage camera system. There were about 100 pictures taken (in video mode) and took the average heat picked up was 130 degrees F.

Third test: ***Is browns gas radioactive?***

The browns gas seemed to be slightly more radioactive then the background radiation, the amount varied by around a 5 millirems more then background radiation (constituently same in over 10 test). I was unable to determine what type of radiation was being produced, however I believe I can rule out Alpha and Gamma radiation, due to the fact that there was defiantly no helium (alpha particle) and gamma has too much energy, I determine it was beta particles. Hydrogen has three isotopes. The most common, making up more than 99.98% of the hydrogen in water, has 1 proton and 0 neutrons. A second isotope, deuterium, has 1 proton and 1 neutron. Deuterium, D_2O, is also known as heavy water and can be found in electrolysers when they have been running for sometime, the water left in the fuel compartment will have a larger amount of heavy water (because it is 'heavier' then water it sinks and also is harder to brake apart). This is one method that those in the nuclear business get heavy water (it helps regulate the amount of neutrons produced in nuclear fission). The third isotope is tritium, has 1 proton and 2 neutrons, and is radioactive (half life of 12.3 years). T_2O exists in nature only in tiny quantities, being produced primarily via cosmic ray-driven nuclear reactions in the atmosphere. The radiation released by T_2O and D_2O is Beta radiation (high energy electron).

Fourth Test: ***What is the electron density of Browns Gas?***

The electron density is the amount of electron per given area, thus I extrapolate that it is the electron density of Hydrogen and Oxygen (there form matters, if is a in a diatomic state it could hold a given amount of electrons, if is a monatomic form it will hold a separate amount of electrons). The given amount of electrons per liter in Browns gas is (unlit) ~ 3.9222X10^27 per liter (with an error of 12 % due to equipment). The electron density distribution in an axisymmetric gas may be determined by measuring the deviation of a gas laser beam on passing through the gas. If the beam is inclined at a small angle to the axis of the gas the bending is closely proportional to the difference between the axially averaged electron density at the radius at which the beam enters the gas, and at the radius at which it leaves the gas. Experimental results demonstrating the validity of this method, and the advantage and limitations of beam bending as a diagnostic tool (It shows great accuracy for electron density measurements but there are some factors that need more study). This was done in a physics lab using 'EDMA' (she) or Electron Density Measurement Apparatus. After testing (mathematically) we found that the amount that diatomic did not work, it was too small. Monatomic did not work either, it was still too small. When compared to water the amount is much closer, 3.1052X10^27 per liter is what the book said is water. This ~ 4.0221X10^27 per liter is saying that there is about 0.8x10^27 (remember 12 % error, it however still does not explain that difference) difference between the two numbers, meaning that there is significant added amount of electrons. This could mean that the substance is water that has soaked up electrons.

Fifth test: ***Does it react to a magnetic field?***

We also pulsed a large magnetic coil to around ~1.5 teslas, as close to the beam of flaming water as possible and it acted diamagnetic (was repelled). Water is diamagnetic, and there was a visible kink in the flame (however it was not much). IF it were in two gases then we should see some separation, however there appeared to be none. Oxygen is paramagnetic and hydrogen is diamagnetic, however the molecule of water takes on the propriety of diamagnetictism. (This can be expected, as the portion of the flame that is visible should mostly BE water, in the form of steam, having already exploded and imploded near the torch tip) [16]

Sixth test: ***How much energy is in one liter of Browns Gas?***

I calculated about 15K joules in one liter. I used a one liter container that (Vacuum Filtering Flask) was first striped of the air inside. I filled it with browns gas and let it seep out gas for one hour, this was to ensure it had only Browns Gas with in it. I put the gas into separate containers (5 ml of browns gas) and had a thermal camera video the ignition of the gas with in the containers. I had my professor and two other professors help with the math and back calculating the amount of energy in 5 ml of gas and then took an average of 5 ml. The next step was to just multiply the factor of 5 ml till I had 1 L of gas (mathematically). This is how I was able to find the ~15k j and why I said "calculated".

Seventh test: ***What is the gas temperature before it becomes a flame and what is its density?***

It comes out of the nozzle (unlit) at very cool temperature of around 60 to 70 degrees and has a density of around .9 (that may be familiar seeing how water is ~1…).

Note: I originally had filled a 'Vacuum Filtering Flask' full of browns gas and had left it out for ~12 hours (the lab shut down that night and I had to wait for morning), this was in a plugged glass container witch had been sealed for extra protection of leakage of gas's in or out of the container. I had to return the homebuilt browns gas machine (he only let me borrow it for a few

days) and so did not have access to it for more examination. Thus on arrival the next morning the test seemed to appear to have the density of water. I learned later that browns gas would turn back into O2 and H2 if left for long time and expressly in direct or indirect sunlight. I tested the remaining gas in the container and found traces of H2 and O2 and Water, so it would of skewed my results because of such a wait and sunlight interaction.

(Unlit it should have been about 0.45. Lit it should be close to 1 [16]) I measured one liter of the gas coming out of the nozzle and weighed it, mathematically it did not match monatomic or diatomic, it seem to heavy, however I had trouble in the fact that hydrogen will escape as soon as it can, so the weight may be off. Over all, Brown's Gas seems too heavy to be monatomic or diatomic, but it had proprieties of water in that vapor state.

Note: Gorge points out that a bag filled with Brown's Gas will rise in air, that can't happen if the density is near 1. This means that there were skewed results on my part.

Eighth test: ***Will the gas act like a battery? If it is put through a fuel cell what is the energy?***

I tested the unlit gas and lit gas. I found that lit gas is exposed to two pieces of metal (about 5 mm away from each other) it will give a voltage of about 1.4 V and through a fuel cell it gave 5 V. The metals I used were Copper and Aluminum there were 2 flat panels about 3' x 3' large and they were oriented to just barely hit the beam of the browns gas. The unlit gas seemed unresponsive to these test. I did notice a static spike during the lighting process, however have no explanation for it (I first thought it was a malfunction…). My teacher pointed out that this may be an effect similar to a thermocoupler; in witch heat is turned into electricity by means of the beam of burning browns gas.

Ninth test: ***Will it burn in a vacuum?***

The flame will burn in a vacuum, when I used the schools vacuum chamber with a small browns gas machine (I borrowed) it made a flame nearly 2 times as long as normal in air gas and ~ 1.5 times hotter (however it was a tuff experiment due to lack of quality equipment). I used the same SD thermal imaging storage camera system as in test two. The vacuum chamber was about 1 foot by 3 feet and could reach a pressure of around 1/5000 of that of sea level (meaning it was not a true 100% vacuum however it would be able to prevent the burning of most all things at such pressures). The torch I borrowed I was able to fit into the vacuum chamber and I rigged it to a barbecue igniter (so only one wire was coming into the chamber from a pressure level valve and the other was connected to the metal chamber it's self), the hole test set up was able to just fit in to the vacuum chamber r. The 'window' was able to show the length and we took thermo pictures of the flame and found a slight spike in heat as the pressure dropped. We were unable to go to full depressurization (due to the water literally boiling away and the effects of pressure on water).[12] We could not measure the flame directly but noticed a real change in length.

Tenth test: ***Is flux needed (when welding)?***

Flux is not needed, even when I added flux it burned and moved off the metal pieces being welded together. It was able to even 'burn' rust off things, to expose the metal.

Eleventh test: ***Will it neutralize radioactive elements?***

The test were inconclusive, however there was a significant difference before and after the test sample of Americium from an old smoke detector reacted to the Geiger counter. Upon trying to melt the sample, it exploded and I found only part of the remains, the Geiger counter did not detect any other pieces of the element (proof?), but about 1/3 of it that seem to retain it's radioactivity. (This test was cut short by the teacher, who did not want radioactive elements getting lost in the lab…)

(The protocol is to mix the radioactive material together with equal parts aluminum and iron. The resulting 'pop' as the aluminum and iron turn into thermite and explode, in the presence of Brown's Gas, neutralizes the radioactive waste. Good to do it in a special chamber, see video from Eagle-Research, can add to references) [16]

Twelfth test: ***What is the nozzle velocity of the browns gas?***

It is about 7.62 Meters per second. I used a weather vane (for measuring speed of wind) that was made with aerogel wind fins. "Aerogel is a low-density solid-state material derived from gel in which the liquid component of the gel has been replaced with gas." [17] This would resist high temperature, however still reacted to the flame and began to desterilize. I span the wind meter and put the fins into the flame, this made the wind vane spin which in turn made current that could be translated into speed. The measurement of 7.62 M/s is an average of the test preformed.

Thirteenth test: ***What is its reaction to a high - ion source?***

The gas was neither deflected or attracted, however it lit the flame. The electricity is very attracted to the gas; I had an arc of electricity nearly a foot long (normal length was about 2 inches). I believe the gas to be in a high energy state that can conduct electricity in a manner of a wire. The gas seemed to be impervious to getting ionized (needs more study).

Fourteenth test: ***What color light does the flame give off?***

It does not give the normal emission spectrum of hydrogen, nor oxygen, unknown.

Information on Water and proprieties thereof

Water is very interesting; it shapes earth and everything we see.
Freezing is what happens when HEAT is displaced or 'moved'. You see when water freezes HEAT is let out. The heat in the water is released and only the slow or 'cold' molecules remain in the water witch will eventually turn into ice.
Well what about thawing ice? It is the process of heat being absorbing into the ice is namely, 'thawing'. If you were to thaw one pound of water, you would use X amount of energy. That X amount of energy would HAVE TO be taken out of the one pound of water to reform it to ice.

Let me explain just a little more, the heat given out by the freezing water will actually slow the freezing process; this tends to slow down the temperature change in the vicinity of the water. Think of this, in areas of great water, such as ponds, lakes and rivers, gives tremendous amounts of energy when the temperature becomes cold. This energy given out by those bodies of water keeps the temperature in those areas from reaching extreme bitter cold temperature. Think of North Dakota and its tremendously bitter cold temperature and no large bodies of water and then

of Michigan's witch is at the same latitude, but has the great lakes surrounding it. It has much nicer and milder temperature during winter time.

When cooled to near freezing point the molecules rearrange to minimize their energy, form the hexagonal crystal structure of ice that is actually of lower density: hence the solid form, ice, will float in water. Having a lower density as a solid than the liquid makes ice melt if sufficient enough pressure is applied. The increasing pressure will make the density less, causing it to reform into a liquid state.

Now let's explore another aspect of water. Lets take water at normal temperature (lets say 70 degrees), if the temperature were to fall at the surface, the colder water (not ice yet) at the top would sink to the bottom, as it contracts and gets denser. The warmer water from the bottom will be forced up because of it being lighter and less dense then the falling cold water. This becomes a cycle that will continue until water comes to exactly 39 degrees.

When this point happens, that cycle will stop and the water will be at its greatest density. When the temperature continues to fall more, the water will begin to expand (even form something similar to a crystal) this means the expanded water will then make its way to the top (less dense) to form ice. In most cases the ice that forms on top of the water will act like a wall to prevent the farther freezing to the water under the ice. Ice is a poor conductor of heat and the denser water underneath the ice will remain near the constant 39 degrees.[1]

Because water is so different then other liquids it makes life possible. If the ice were to sink (or act like 99% of all other liquids) rivers lakes oceans would freeze solid and kill everything (maybe except microorganisms); it would most likely render earth inhabitable.

Let's talk about the vapor now.
Clouds are water droplets that gather together to form the white puffy things in the sky. In spring time farmers know that if they see clouds they will not expect any frost to come. Clouds absorb great amounts of heat. This heat is slowly released during the night preventing frost to form. The heat that comes from the ground (from the sun or inner earth) will radiate out into space unless there are clouds out to reflect and absorb that heat. I believe earth would be un-inhabitable if there were no as clouds (maybe not all life but all land dwelling things).

When any water vapor condenses back into liquid water, it will release all energy that would have been necessary for it to become steam. That is a large amount of energy that is put back into the air and sky. To convert water into vapor requires a large amount of heat. When the vapor condenses into water all this heat is given out again. [1]

One last thing, do you know how you would go UP into the mountains and cook, lets say, soup and when you go to eat it, just after boiling it, it seems as if its still cool and not warmer. This is due to the pressure, or lack of it, that is up in the mountains. The less the pressure the cooler the temperature of boil. Just the opposite is something such as a pressure cooker, because of the sealed container the steam builds up causing more and more pressure making the temperature of boil higher and higher; which will help in cooking food faster. In space if you were to slowly release the pressure in a container with water in it, it would literally 'boil' to an ice cube.

This effect is due to the 'hot' molecules of water that can escape the surface tension at less and less pressure, until only 'cold' water exist, hence it freezes. So evaporation of water is when all the heat is absorbed (steam), leaving all the slower or colder particles around the area of the water, so in essence it is a cooling process, it absorbed the heat around it to become hotter. When you freeze water it moves all the heat out, heating everything around it, so in essence it is a heating process. Things around the water become hotter. There is another odd effect of water

called the Mpemba effect is the process that hot water can, under certain conditions, freeze sooner than cold water, it is hard to explain. [12]

Oxygen attracts electrons much more strongly than hydrogen (more electronegative), resulting in a water molecule having a positive charge on the side where the hydrogen atoms are and a negative charge on the other side, where the oxygen atom is. Electrical attraction between water molecules is due to this dipole nature of individual water molecules to pull each other closer together, making it more difficult to separate the molecules (meaning the charge differences will cause water molecules are attracted to each other).

This attraction is known as hydrogen bonding. Surface tension is a manifestation of this unique bonding (important later). Also hydrogen bonding is a comparatively weak attraction compared to the covalent bonds within the water molecule itself. Currently chemistry says that any water molecule can have at most four hydrogen bonds (which I will talk about later). It is believed that hydrogen bond in water is largely due to electrostatic forces and some amount of covalence bonds. Hydrogen bonding also gives water its unusual behavior when freezing. [10]

Could just Hydrogen explain these proprieties of Browns gas?

Hydrogen by its self cannot explain everything; however there are torches that use hydrogen to weld. This may help in explaining some of the effects but is a far cry from explaining all the effects of browns gas. I included information on other torches to show the difference. [10]

Hydrogen[11]:
Molecular bonding strength of Hydrogen: 104 Kcal per mole
Protons/neutrons/electrons of average Hydrogen: 1/0/1
The ground state energy level of the electron in a hydrogen atom: −13.6 eV.
Energy it takes to split H_2 hydrogen molecules: 4.476 eV.

Atomic Hydrogen Torch: 4000 °C
Acetylene Torch: 3300 °C
Cyanogen Torch: 4525 °C
Dicyanacetylene Torch: 4987 °C
[5]
Browns Gas Torch: depends on object to be heated… However its relatively 'cold' flame of about 130 degrees seems to defy it welding anything.

Atomic Hydrogen Welding is a form of arc welding. It uses an electric arc between two metal tungsten electrodes (An electric arc efficiently breaks up the hydrogen molecules, which later recombine with tremendous release energy, mostly in the form of heat). The atomic hydrogen torch uses it to generate very high temperatures near 4,000°C for welding (still not matching the browns gas). The heat produced by this torch is enough to melt or weld tungsten (3422 °C). The presence of hydrogen acts like a ‘force field’ and protects metals from mixing with carbon, nitrogen, or oxygen (hence, no flux is needed…).[9]

The hydrogen gas is normally diatomic (H_2), however the electric arc breaks down the hydrogen into its atomic form, which in turn absorbs that energy in the form of heat. When the hydrogen hits any hard cold surface, it reverts back into its diatomic form and rapidly releases that stored heat (Ref. 7). NASA is making use of atomic hydrogen as a rocket propellant by “storing it in liquid helium to prevent it from recombining into molecular hydrogen. When the helium is vaporized, the atomic hydrogen would be released and combine back to molecular hydrogen. The result would be an intensely hot stream of hydrogen and helium gas. The liftoff weight of rockets could be reduced by 50% by this method.”[3,6]

Commercial Electrolysers:

It has been found that a single electrolytic cell operating without diaphragms at several hundred amps will generate hydrogen and oxygen at a reasonable rate for small welding and brazing work but for larger work (for example, the welding of 10 mm steel plate) the required amperage becomes excessive (typically of the order of 900A or more) when considering the size of conductors and transformer and the problem of heat generation. [7]

The ER1600 WaterTorch is a series-cell or bi-polar electrolyzer design uses higher voltage and lower amperage to create the Brown's Gas. 1200 liters of gas per hour is created using about 22 amps at 145 VDC. I find the ER1600 WaterTorch very versatile and effective means of cutting and welding. [16, 18]

So if it is not Hydrogen can Oxygen explain these proprieties of Browns gas?

Oxygen's electrons are partially unpaired, which increases the magnetic field. Oxygen is paramagnetic by its self.

Oxygen[11]:
Molecular bonding strength of Oxygen: 118 Kcal per mole
Protons/neutrons/electrons of average Oxygen: 8/8/8

"Oxygen is not a flammable gas-it does not burn. But oxygen does support the burning of other substances. A glowing wooden splint placed in a test tube of oxygen will continue to burn until the oxygen is used up. This ability to support burning is another example of a chemical property. By using the chemical properties of flammability and supporting burning, you can distinguish between the two gases hydrogen and oxygen. Oxygen is the most common oxidizing agent and it is also one of the strongest. Because oxygen is such a strong oxidizing agent there is nothing that will oxidize oxygen, so oxygen does not "burn"." (Need I say more?) That was the best way of describing it and it is not able to reach the temperatures by its self that Browns Gas produces… It is unlikely that oxygen is solely the gas making the unusual proprieties. [2,4]

Some History…

Yull Brown:

Yull Brown spent many years working with the gas in Australia. He seems to be the father of the gas and kept secrets from the public. He gave many public demonstrations and received his own patents (4010777 and 4081656). Until his death in 1998, he was considered the world's foremost expert on the gas. [13, 15]

Dr. William Rhodes:

One of the first researchers to describe common duct electrolytic oxy-hydrogen was Dr. William Rhodes. In the early 1960's, Dr. Rhodes received two U.S. patents (3262872 and 3310483) for methods of producing this unique gas. He stated "Of all elements, hydrogen and oxygen should hold no secrets. [13, 15]

Browns Gas

I conclude that browns gas does not exhibit proprieties of monatomic O or H, however does have some H2 and O2 made in the production (I believe), but is not completely H2 or O2. It has unique in many ways, for example it CAN sublimate tungsten, nearly 6000 degrees and appears to put the energy straight into whatever material the browns gas flame hits. If the electricity is absorbed by a water molecule, those extra electrons, will splits 2 water molecule in to H2 and 2 molecules of HO then the 2 HO split into O2 and H2.

But, if for some reason or under special circumstances a water molecule takes the electrons and pushes the existing electrons in the molecule into lower energy states to make room for the new electrons, then the water would have a propriety change and have high negative charge. Under this new state it would have most likely grown in size and repel most other water molecules (water having a larger negative charge then positive, it would like to escape).

It would be expected to be a gas because of the great repulsion of the new state molecule. The energy that was soaked in to the new state is then semi-stable and if there was a heat added it would release the extra electrons and fall back into its regular state (just water). Water in most forms is a great insulator, however in this odd form of "electric steam" it would act very much like a conductor, which browns gas seems to be great at conducting electricity.

Also it would still exhibit the diamagnetic proprieties that water usually has. The electron density also makes it appear to still be in the range of water, NOT O2 or H2 or O or H, none of them seem to give right answers mathematically for the electron densities. However in Browns gas it does (at least closer then any thing else)! Meaning it is a unique relatively unknown form of WATER.

We know that electricity CAN sublimate using electric means. We also know that everything, everything can and will get hot when used as a resistor for electricity. When this electric steam finds a way to release it's electrons it will, so if it hits a piece of metal the extra electrons from the 'electric steam' will be traveling the speed of the gas plus there original speed around the excited water molecule. Normally, the field present in the wire would create a net acceleration in the same direction of the force; however the constant collisions of electrons create a drag effect. The effect on a hole is an average group velocity referred to as the drift velocity (Vd). It is followed by the equation of Vd=J/(PeE)
J= joules
Pe= the free electron density of desired material the electron is traveling in (water)
E= charge of electron (1.602 x 10^-19)
(Ref. 1)
Using this equation it will be able to help determine what amount of joules and the speed of the electrons. In case of the browns gas, it is like a moving wire at about 7.4 M/s plus the original speed of the electrons (if the gas was stationary), so the material that is being hit by this high energy gas has those extra electrons transferred into the new material. Those electrons will disperse causing high heat due to the electrical resistance of that material (that is why it changes for every material it hits).

These high energy electrons will not travel as fast as the gas was traveling, when it hits the surface of something it will have the electrons slow down significantly, thus releasing there kinetic energy as heat, the more dense and resistive the material the hotter, the less dense or more conductive the material the less heat will be generated (however it is still have a high heat because of the kinetic energy of the electrons). Also remember things like silver with high conductivity and high density still can melt, mainly because of the density of the silver. The Browns Gas flame is a unique method for transmitting electrical energy directly into the atomic structure of materials. Because Gas reacts on a molecular scale, I think more experiments should be done on what happens to the structure of a material after being altered by Browns Gas.

The flame, upon application to an element or compound of elements, increases its temperature due to an interactive combustion property which is one of the unique characteristics of Brown's Gas. [12]

"There is no theoretical limit to the flame as applied to materials as the local environment of the combustion will determine the extent of incremental calorific energy supplied or released." [13]

Also the flame will burn in a vacuum, when I used the schools vacuum chamber with a small browns gas machine (I borrowed) it made a flame nearly 2 times as long as normal in air gas and ~ 1.5 times hotter (however it was a tuff experiment due to lack of quality equipment).

When looking up information about Browns Gas I found the most common theory that was circulated was the monatomic hydrogen and oxygen. The monatomic theory was abandoned by a few separate people years ago (I found this out after the looking more info up about it online), but continues to persists. One of those people is Gorge Wiseman, who has found innovative ways of producing this gas. He says: "My new theory of Brown's gas is '**electrically expanded water**.'… I currently think that Brown's Gas is water and that it is water that has absorbed electricity like a sponge absorbs water. I think that the atomic bonds are NOT broken, so Brown's Gas is STILL WATER; just in a high energy gaseous form that is NOT steam. Thus, when the electricity (in the Brown's Gas) is released by the 'flame,' it comes out as electricity and the water 'implodes' to it's original liquid form, with no heat and no expansion first. That's also why the flame is 'cool' yet has high energy effects.
" [16, 20] This statement supports and gives more explanation then to this paper and the data gathered in my experimentation.

In 'electric steam' might be plasma where only the electrons would be excited, and the water molecules would much cooler. This is called "non-equilibrium plasma" or "cold plasma", where the electrons have high energy but the water molecules are relatively cool and the ions are made by the high energy bombardment by the electrons while the water molecules are cool, hmm sound familiar….

In a plasma of water you will have free electrons, water vapor positive ions (H2O+), and also other positive ions like OH+, O+, and H+ and because the water vapor molecules will be broken up in the plasma, but you do not find this in Browns gas. The water is protected if in a non-equilibrium plasma state, this means that it still water but has a 'shell' or 'layer' of electrons being carried piggy-back the water.

If clouds have "electric steam" it may show that if the electron density is much higher in clouds. It is still undeterminable (seeing it is hard to replicate the construction of a cloud) however measurements of electron densities in clouds shows higher then the calculated amount (of course scientist have tizzy fits over this). This is explained away in theory that it is 'dust' that brings the electrons and holds them (but such dust is not found in amounts that would constitute lightning or even found in existing clouds).

According to theory: "Clouds become electrified when strong updrafts carrying dust or more water bring supercooled liquid water drops and dust will hit the ice crystals at temperatures less than freezing (0 deg C) together. In this environment, interactions between the ice crystals and supercooled water droplets and dust produce electric charges. The exact mechanisms by which this charging happens remain unknown. The electrical charges build up until they are strong enough to overcome the resistance of the surrounding air. The breakdown of the electric fields produced by these charges is the lightning bolt." (Wikipedia search on lightning) What if lightning is from this electric steam, electrically expanded water, Browns Gas instead…

So in conclusion I think that browns gas is not O and H like current theory says, but some new form of unexplored water electric steam.

References:

[1]
Anomalous water -- explained by Brown's Gas research. Planetary Association for Clean Energy Newsletter. Vol. 6 (4), July, 1993. p. 11 - 12.

[2]
“Advanced Chemistry in Creation” College Chemistry Book, By Dr. Jay L. Wile

[3]
http://gltrs.grc.nasa.gov/reports/2002/TM-2002-211915.pdf

[4]
http://en.wikibooks.org/wiki/General_Chemistry/Book_Cover

[5]
Welding Handbook Vol. 2 Library of Congress number 90-085465 copyright 1991 by American Welding Society between the work and each electrode.

[6]
http://www.specialwelds.com/underwater-welding/atomic-hydrogen-welding.htm

[7]
http://www.lateralscience.co.uk/AtomicH/AHW.html

[8]
http://www.lateralscience.co.uk/AtomicH/atomicH.html

[9]
http://www.cheniere.org/misc/a_h%20reaction.htm

[10]
McCarthy, John (1995-12-31). Hydrogen. Stanford University. Retrieved on 2008-03-14.

[11]
Chieh, Chung. Bond Lengths and Energies. University of Waterloo. Retrieved on 2007-12-16.

[12]
Bearden, T. E.. A redefinition of the energy ansatz, leading to a fundamentally new class of nuclear interactions. In: Proceedings of the 27th Intersociety Energy Conversion Engineering Conference, San Diego, California. 1992. IECEC, c/o American Nuclear Society. Vol. IV. p. 4.303 - 4.310.

[13]
Brown, Yull. Welding. U.S. Patent 4,014,777. March 29, 1977. ["The invention also relates to atomic welding to which the mixture {of hydrogen and oxygen generated ion substantially stoichiometric proportions} is passed through an arc causing disassociation of both the hydrogen and oxygen into atomic hydrogen and oxygen which on recombination generate an extremely hot flame."]

[14]
Larry Oja. Malad Idaho, used his ER1600 WaterTorch and tools.

[15]
Michrowski, A. Yull Brown’s Gas. Planet. Assoc. Clean Energy Newsl. 1993, 6 (4), 10-11.

[16]
Comments by George Wiseman that were added in (there are some grammar add on as well)

[17]
http://en.wikipedia.org/wiki/Aerogel

[18]
http://www.watertorch.com/whatis/whatis1.html

[19]
http://www.pureenergysystems.com/academy/papers/Common_Duct_Electrolytic_OxyHydrogen/index.html

[20]
http://www.eagle-research.com/browngas/whatisbg/whatis.html

[21]
http://www.phact.org/e/bgas.htm
[22]
http://www.eagle-research.com/browngas/whatisbg/whatis.html