A Catalytic Role of Atomic Oxygen on Anomalous Heat Generation Induced in Proton Conductive Ceramics under Hydrogen Atmosphere

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ABSTRACT

It was demonstrated that there could be a lower orbit of electron of hydrogen below the ground state by a catalytic process using potassium ions [1]. This process can generate heat energy somewhat between chemical reaction and nuclear reaction.
This paper describes that atomic oxygen in proton conductive ceramics can play the same kind of role as potassium ions, leading to anomalous heat generation and nuclear reaction

INTRODUCTION

There are several scientists who claim that an electron with lower energy states than the ground electronic state is possible in the hydrogen atom. According Dr. Randlle Mills, one of these scientists, it is postulated that hydrogen atoms can achieve these lower states by a resonant collision with a near by atom or combination of atoms having the capability to absorb the energy to effect the transition[2]. The potassium ions are identified as having a transition energy level that matches with the potential energy of the electron of hydrogen atom with the ground state (27.2eV) needed to effect a transition from the generally accepted ground state associated with quantum number n=1 to a lower energy state with n= 1/2, and to other lower fractional states.
Shown below is Dr. Mills' postulation.

$$K^+ + e^- \rightarrow K + 4.34\ eV$$
$$K^+ + 31.62\ eV \rightarrow K^{++} + e^-$$
$$K^+ + K^+ + 27.28eV + H \rightarrow K + K^{++} + H_{1/2} + 40.8eV$$
$$K + K^{++} \rightarrow K^+ + K^+ + 27.28eV$$

Net reaction is : $H \rightarrow H_{1/2} + 40.8eV$

The author postulated that 2 atomic oxygen can play the same function as potassium ions because the ionization energy of oxygen is 13.61eV and 2 atomic oxygen's ionization energy is 27.22eV which is very close to the potential energy of the electron of hydrogen 27.20eV.
Shown below is its calculation.

$$H + 2O + 27.22eV \rightarrow H_{1/2} + 2O^+ + 2e^- + 40.8eV$$
$$2O^+ + 2e^- \rightarrow 2O + 27.22eV$$

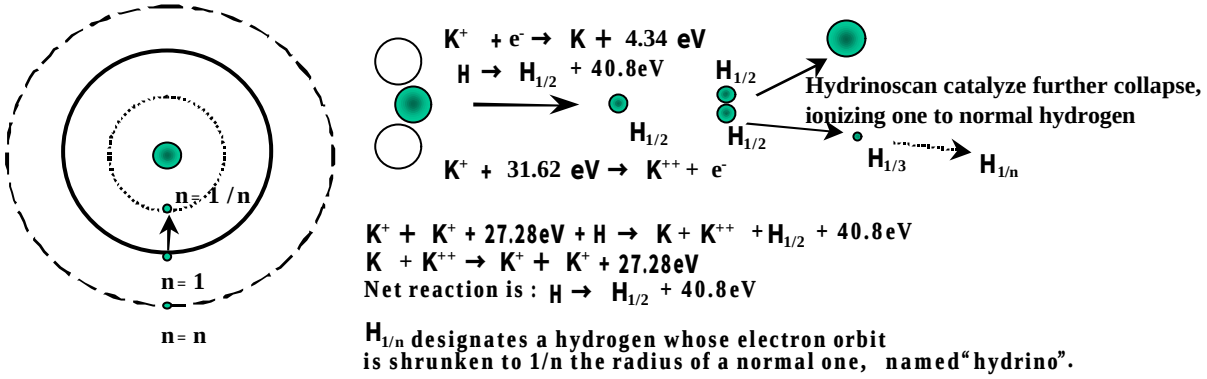
Net reaction is : $H \rightarrow H_{1/2} + 40.8eV$

It had been shown that this postulation can be applied to the explanation of several anomalous combustion phenomena that cannot be explained by current theories, such as stoichiometric mixture of hydrogen and oxygen, known as Brown's gas and air-less combustion of emulsified fuels and others[3].
There have been several reports that some proton conductive ceramics generated anomalous heat under the atmosphere of deuterium.

This paper explains that atomic oxygen can play the same catalytic role in the proton conductive ceramics as was in the case of anomalous combustion of Brown's gas and others.

DR. MILLS' BLACKLIGHT PROCESS

Dr. Mills' postulation : pottasium ion is catalyst)



The author's postulation: atomic oxygen is catalyst

Ionization energy:
Hydrogen =13.599 eV
Oxygen =13.618 eV

$$H + 2O + 27.22eV \rightarrow H_{1/2} + 2O^{+} + 2e^{-} + 40.8eV \quad [1]$$
$$2O^{+} + 2e^{-} \rightarrow 2O + 27.22\,eV$$
Net reaction is : $H \rightarrow H_{1/2} + 40.8eV$

Fig 1 Mechanism of "hydrino " generation and energy release by Dr. Mills and the author

Fig 1 shows Dr. Mills' blacklight process.

Dr. Mills named this shrunken hydrogen atom "hydrino" and he claims that this hydrino can be a catalyst to shrink other hydrinos to further lower states, increasing the energy release per atom by the process, resulting in the energy release of the level of 1000 eV / atom in total which is about 1000 times more energy than conventional chemical reaction. Based on this theory, Dr. Mills developed a water based electrolyte cell using a potassium carbonate electrolyte and succeeded in generating anomalous heat. Then he started a new approach using hydrogen gas and potassium ion in gas phase and he claims he succeeded in generating anomalous heat generation as stated before.
More attention is now being paid to neutron like particles for the initiation of cold fusion. It can be anticipated that well shrunken "hydrinos" can be deemed almost as neutrons because the electron with a tighter orbit can neutralize the positive charge of proton. The author postulates that these well-shrunken "hydrinos" are the cause of the initiation of cold fusion.

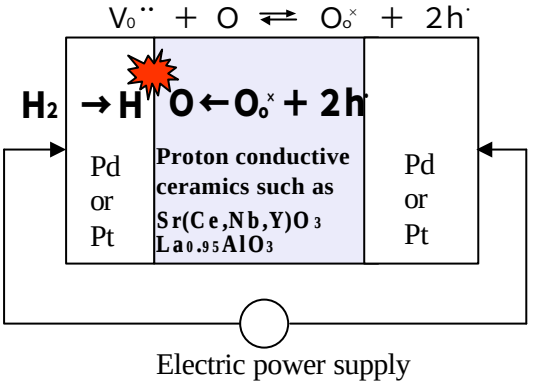
"HYDRINO" GENERATION INDUCED BY ATOMIC OXYGEN IN PROTON CONDUCTIVE CERAMICS

When certain proton conductive ceramics such as $Sr(Ce,Nb,Y)O_3$ or $La_{0.95}AlO_3$ with palladium or gold plating are heated and electrolyzed in deuterium, anomalous heat generation has been observed[(4),(5)].
The cause of proton conductivity in these ceramics is said to be due to oxygen vacancies expressed as $V_o^{\cdot\cdot}$.
When such ceramics as $Sr(Ce,Nb,Y)O_3$ or $La_{0.95}AlO_3$ are heated in the oxygen rich atmosphere, $V_o^{\cdot\cdot}$s absorb oxygen and turn into oxygen ions $O_0^{\times}$ and electric holes

h • as is expressed in the following expression.

$$V_0^{\cdot\cdot} + O \rightleftharpoons O_o^{\times} + 2h^{\cdot}$$

In the case of experiments above mentioned, the test layout can be simplified as shown in Fig 2.
When electric field or thermal fluctuation is applied to the test layout of Fig2, it can be expected that collision of atomic hydrogen and oxygen at the joint face would take place, resulting in generation of "hydrino" which then fuse with nucleus of other elements due to its neutron like characteristics.



Collision of an atomic hydrogen with 2 atomic oxygens

$H + 2O + 27.22eV \rightarrow H_{1/2} + 2O^{+} + 2e^{-} + 40.8eV$

$2O^{+} + 2e^{-} \rightarrow 2O + 27.22eV$

Net reaction is : $H \rightarrow H_{1/2} + 40.8eV$

Fig2 Illustrative drawing of a typical embodiment of cold fusion experiments using proton conductive ceramics

DISCUSSIONS

Dr. Y. Iwamura and et.al., have clearly shown that the following 3 conditions are requisite to make cold fusion happen(6).
1 high D/Pd
2 enough diffusion flux of deuterium
3 the existence of a third element except Pd and deuterium.
They developed a multi-layer cathode made of Pd, CaO and Pd.
It is not clear how the crystal structure of CaO in this case, and how strongly oxygen atoms are bound, but it is strongly recommended to study the role of oxygen in this test
It is also well known that there must be some impurities or extra elements in the palladium cathode to have a successful cold fusion by electrolysis of heavy water.
A typical example of description of this is as follows.
" For many years, Dr. Martin Freischman has recommended a particular type of palladium made by Johnson-Matthey which he calls “Type A”. It was developed a decade ago for use in hydrogen diffusion tubes. This material is prepared by melting under a blanket gas of cracked ammonia the concentration of five key classes of impurities being controlled. Electrodes were made a succession of steps of square rolling, round rolling, and finally, drawing with appropriate annealing steps in the production cycle"(7).
I have no idea what are five key classes of impurities but I suppose one of which must be oxygen.
The reproducibility of excess heat generation using these proton conductive ceramics was not necessarily good. It has been often reported that the first try was good but second try was no good. The author speculates that during the time before plating for the second try, oxygen had escaped and there were not enough oxygen atoms because the atomic oxygen tends to do so in some proton conductive ceramics.

SUMMARY

It was shown that atomic oxygen could play the catalytic role for generation of "hydrino" in proton conductive ceramics.
Review on the past cold fusion experiments from this standpoint is strongly recommended.

REFERENCE

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