

Anomalous Difference between Reaction Energies Generated within D₂O-Cell and H₂O-Cell

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Both D₂O-cell and H₂O-cell are constructed with the same Double Structure Cathode (DS-cathode), and connected in series as a “Double-cell” to examine the energy generation under the same electrolytic current. D₂O-cell generates tremendously excess energy during a long period such as over several thousand hours, but any energy is never generated in H₂O-cell when the chemical energy is subtracted in both cells.

Furthermore, “Mixed-cell” blended with D₂O and H₂O electrolytes (D₂O/H₂O=2 in weight) also generates an excess energy, but with the considerably different characteristics from D₂O-cell.

KEYWORDS: DS-cathode, Pd-black, spillover-effect, atom-cluster, nano-particle, enormous excess energy, solid-state plasma fusion

1. Introduction

Enormous reports have been published on the reaction energy of deuterons within solids by a great many researchers so far,¹⁻⁴⁾ but it seems to be fixed as a common knowledge that their results never be recognized because of too poor reliability concerned with a very little reproducibility and an extremely small amount of the “reaction-effect”.

All of those researchers have utilized “bulk-cathode” made by bulk-solid ever since their starting research. The authors consider that bulk-cathode causes the above bad results introduced by its absorption characteristic of deuteriums, that is extremely difficult to get highly deuterated bulk-cathode with uniform density because of the bulk-cathode is utilizing essentially the “diffusion-effect” only.

Consequently, the authors⁵⁾ developed the Double Structure Cathode (DS-cathode) whose principle is shown in Fig. 1. That is constructed with the both “inner-cathode” (Pd-black) and the “outer-cathode” (Pd-vessel). Pd-black used is extremely fine powder of the nano-scale, which is called “nano-

particle” and/or “atom-cluster”,⁶⁾ and is kept in a vacuum space inside the Pd-vessel.

Compared with the “bulk-cathode”, the DS-cathode provides the following essentially excellent functions as demonstrated in Fig. 1;

- 1) Deuteriums are instantly absorbed over 100% in content into all particles of the Pd-black because of both “spillover-effect” and “atom-cluster effect”.
- 2) Deuterium purity is extremely pure within the DS-cathode by the “filter-effect” of Pd-vessel.
- 3) Deuterium pressure within DS-cathode becomes extremely high such as over several thousands atmosphere, until Pd-vessel breaks by the “Sievertz-law” effect.

As a result, the “said-functions” of the DS-cathode provide the capability to generate tremendous excess energy within highly deuterated solid, while the “bulk-cathode” is impossible at all to realize the “said-functions”.

2. Experiment

In order to make clear the difference of the reaction energy

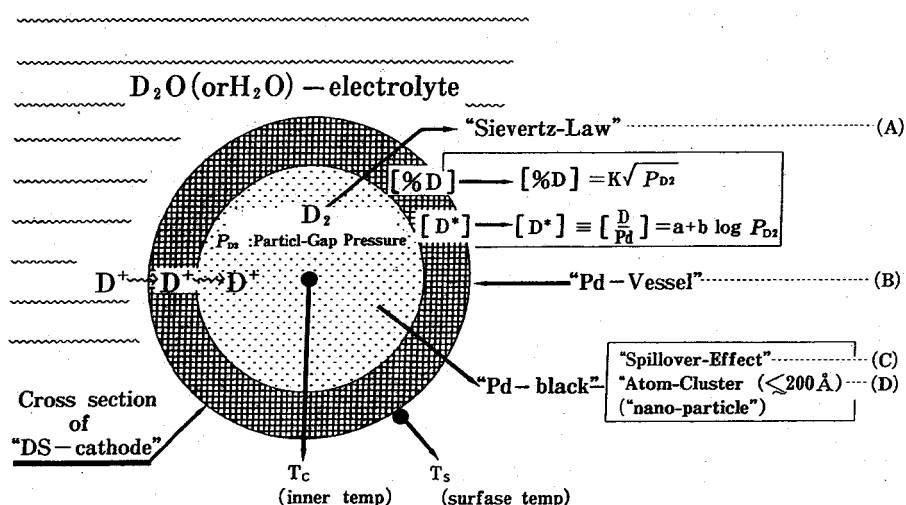


Fig. 1. Concept of “DS-cathode” (Double Structure Cathode) Note (1): Symbols (A), (B), (C) and (D) have special function as follows; (A): Extremely high pressure of D₂ gas (or H₂) takes place easily inside DS-cathode because of “Sievertz-law”. (B): Deuterium purity is extremely high inside DS-cathode because Pd-vessel works as a filter. (C): Deuterium distribution on the surface of all particles of Pd-black instantaneously extends with uniformity and high density because of function of “spillover-effect”. (D): Pd black in nano-scale instantaneously absorbs much deuteriums with over 100% in content because of essential function of “atom-cluster”.

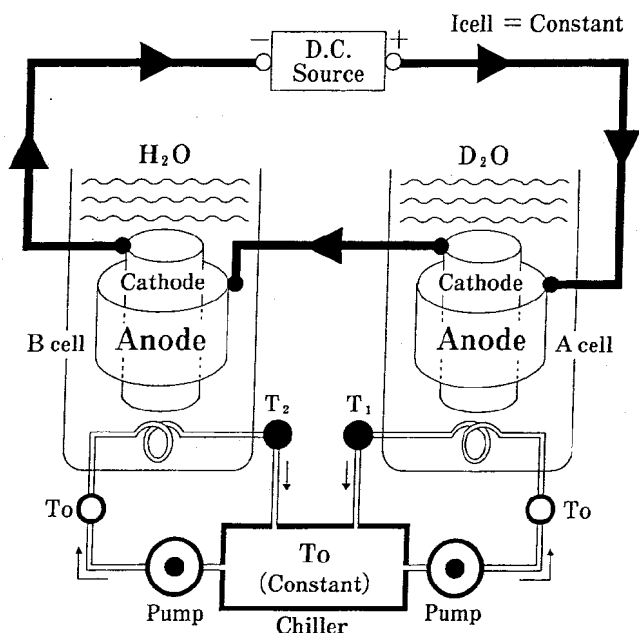


Fig. 2. "Double-cell" connected with two unit same cells in series: A-cell (D₂O) and B-cell (H₂O)
 Note: Although A and B cells are same construction, electrolyte only is difference.

generated in both D₂O-cell and H₂O-cell, both cells, each of which is constructed with same DS-cathode, were connected in series as shown in Fig. 2.

In this case, electrolytic current and its density passing through both cells are the same. Furthermore, using the pure D₂O-cell and the H₂O-cell, pure deuterium and pure hydrogen can be filled up essentially by the "said-function" to an extremely high pressure over several thousand atmosphere within the DS-cathode in each cell, respectively, during electrolysis for long hours. Figure 3 shows one of these experimental results with the electrolytic current 5.5 (A) and 200 (mA/cm²) in the current density, and the similar results were reproduced with 100% reproducibility. These experimental results provide the following facts:

- 1) Tremendous reaction energy generates within the DS-cathode in D₂O-cell, but any energy does not produce in H₂O-cell when the chemical reaction energy is subtracted in each cell.
- 2) "Deuterium reaction" is created in large quantities within highly deuterated solid, but "Hydrogen-reaction" never created within highly hydrogenated solid.

In the present experiment, another experiment using "Mixed-cell" blended with D₂O and H₂O electrolytes (D₂O/H₂O=2 in weight), which is also constructed with the

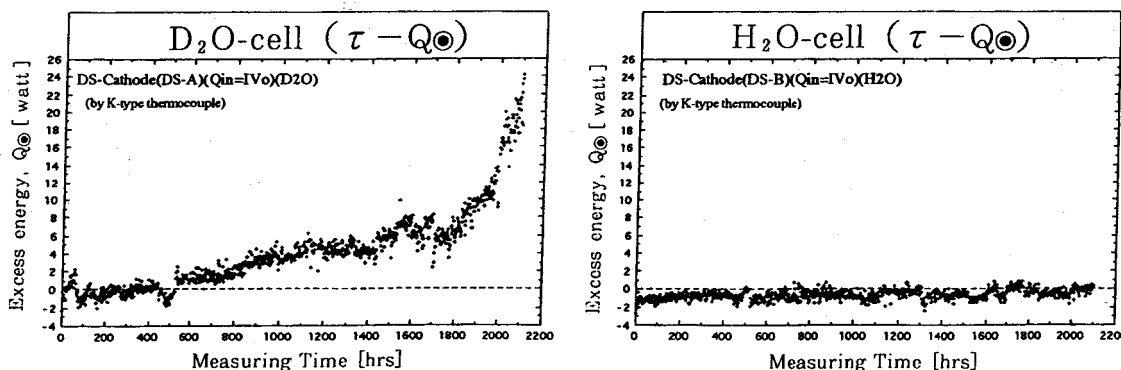


Fig. 3. Characteristics of excess energy generated in D₂O-cell (Left) and H₂O-cell (Right). Note: Enormous differences of excess energies (Q_{\odot}) generated in D₂O-cell and H₂O-cell corresponding to the change of measuring time (τ). These experimental data demonstrate that tremendous "reaction excess energy" generates within the D₂O-cell and the "said-energy" does not produce in the H₂O-cell.

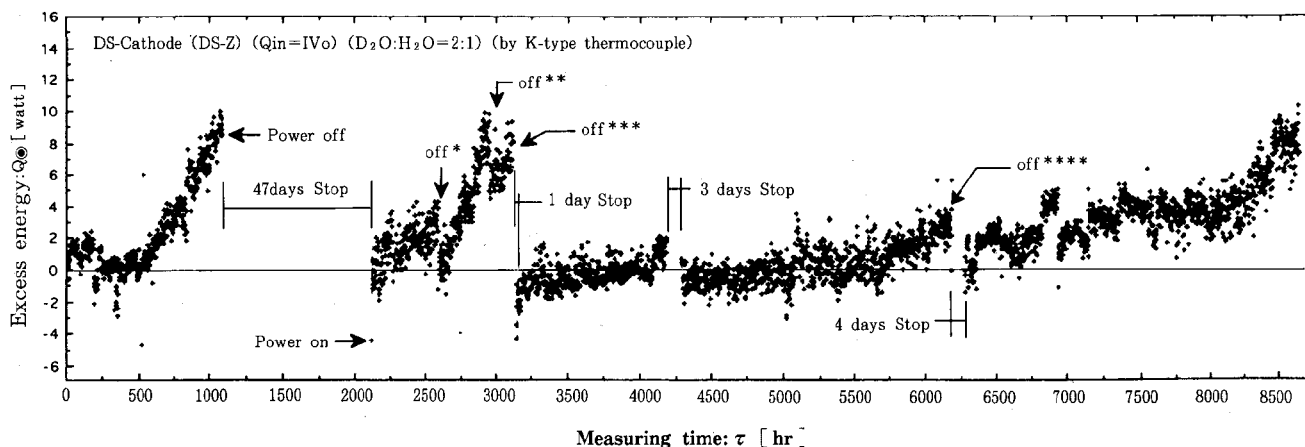


Fig. 4. Characteristic of excess energy generated in the "Mixed-cell" (D₂O/H₂O=2 in weight). Note: off* 1 [hr] and added 33 [gr] electrolyte. off** power off 3 [hr] added 24 [gr] electrolyte. off***: Change into a new electrolyte and polished the cathode surface. off****: A new electrolyte was added by only vapored one.

same DS-cathode, was carried out. Figure 4 shows one example obtained by using this "Mixed-cell" during a long period of 8800 hrs (\approx one year).

The result shows that the reaction energy also creates in the "Mixed-cell", but its characteristic is different in the following points from those in the D_2O -cell:

- 1) To generate the same level of excess energy, input power in the "Mixed-cell" is required considerably larger than that of the D_2O -cell.
- 2) When electrolytic current is stopped during electrolysis, the "Mixed-cell" suddenly degenerates the excess energy and quickly comes back mostly to the starting condition, while the D_2O -cell does not so much change about that.

Consequently, authors consider that the experimental facts as shown in Figs. 3 and 4 present us the information indicated essentially existing of deuterium nuclear reaction within solid.

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