

A Review of The Patterson Power Cell

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October 25, 2011

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A REVIEW OF THE PATTERSON POWER CELL

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An updated and revised version of a paper originally submitted in June 1997 to the 1997 Intersociety Energy Conversion Engineering Conference, the 32nd IECEC, held July 27 - August 1, 1997, in Honolulu, Hawaii.

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A REVIEW OF THE PATTERSON POWER CELL

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ABSTRACT

An independent summary review is presented of the Patterson Power Cell™, as developed by Clean Energy Technologies. Information is drawn from publicly available information, and requested information and data from CETI. It is found that this cell seems to operate as advertised by CETI and that there is a very large amount of supportive documentation available in the public domain to support its operation and capabilities. The ability of such cells to neutralize alpha radiation is fairly well understood. An ability to neutralize gamma or other forms of radiation remains to be seen.

INTRODUCTION

Several 'cells' have been recently reported within the US and around the world that exhibit the ability to produce more output energy in the form of heat than input energy in the form of electricity. These at first appear to be 'over-unity' devices. However, repeatable research has shown that this is really a new form of potential energy that is just now being understood, much like the understanding of an ordinary dry-cell battery.

As this technology is new, several claims have been made, and several rebuttals have been heard. Most books in this field are way out of date, as new developments happen monthly. This paper focuses on the technical capabilities and political operations of the CETI Patterson Power Cell™ based upon the information that we have at the present time (June 12, 1997).

CETI

Clean Energy Technologies, Inc., (CETI) are the developers of the Patterson Power Cell™. Their contact offices and their research facilities seem to be based in FL and NM. Their home page website is located at: <http://biz.onramp.net/~ceti/>.

THE PATTERSON POWER CELL™

The best description of what may be in the actual construction of the CETI cell is given in the CETI technical paper "Flowing Electrolyte Calorimetry", written by CETI researcher Professor Dennis Cravens, dated May 1, 1995, as stated in the CETI website on June 12, 1997 [biz.onramp.net/~ceti/paper1.html]:

"The "Patterson Power Cell™" has been claimed as both a light and heavy water system producing "excess heat". ... "It is one of few cold fusion systems which has been granted a U.S. Patent. This author was requested to evaluate the system." ... "The modified cell is shown in figure 1 [not shown here]. The use of plated beads as the cathode is the most unique feature of this design. These beads were supplied by Clean Energy Technologies, Inc. and are produced and used in accordance to existing Patents." ... "Current work has indicated that, for at least nickel, normal water systems, the cold fusion effects are a surface or near surface effect. Thus, the use of many small spheres provides a large surface area that maintains structural integrity." ... "The base of the bead is a stable cross-linked copolymer made of styrene divinyl benzene. The beads are first sulfated with chlorosulfonic acid to provide a conductive surface. A copper chloride solution is then fixed to the surface. This allows the beads to withstand higher temperatures while avoiding hot spots that would otherwise blow the metal coatings off. Uniform metal plates are then layered accordingly. First with nickel, then with palladium, and then an outer coating of nickel. These multiple layers of nickel/palladium/nickel on beads thus far have out performed single coatings. Others have investigated such multilayer thin films on plates which eventually detached from the surface. The plated beads have performed continually in cells for over one hundred hours without observable changes. It is estimated that 40 mg of metal (a total of about 2 micron thickness of all layers) and about 1200 beads are used within the cell. It is important to note that the small amount of metal used should be beneficial for searches of isotopic shifts."

Until CETI releases further information, and since the CETI patents that are referenced in their recent patent for electroplating these spheres are dated in 1991 and before, it will be assumed that this is an accurate description of the composition of the CETI cell. That is, light or heavy water, with a nickel/palladium/nickel cathode.

THE 1997 CETI PATENT

CETI was granted US Patent 5,607,563 entitled "System For Electrolysis" on March 4, 1997. A summary can be viewed at patent.womplex.ibm.com/details?patent_number=5607563.

The abstract for this patent states: "ABSTRACT: An electrolytic cell and system for electrolyzing and/or heating a liquid electrolyte containing water having a conductive salt in solution flowing through the cell. The electrolytic cell includes a non-conductive housing having an inlet and an outlet and spaced apart first and second conductive foraminous grids connected within the housing. A plurality of spaced beds of closely packed conductive microspheres are positioned end to end within the housing in electrical contact with the first grid adjacent the inlet. The individual microsphere beds are electrically isolated from one another in the absence of the liquid electrolyte. The microspheres are generally uniform in size and density and include a plated layer formed of metallic hydride which is readily combineable with hydrogen or an isotope of hydrogen with hydrazine to form a conductive, preferably flash coated metal layer. An electric power source in the system is operably connected across the first and second grids whereby electrical current flows between the grids within the liquid electrolyte."

It is interesting that the patent does not describe the metals that are used with these micro-spheres, or the layers of the different metals which may be used. This information is found from other publicly

available CETI sources, as quoted above.

Other patents referenced in this patent are listed in Table 1. It is also interesting to note that the answer "NONE" is given in this patent review to: RELATED U.S. APPLICATIONS, FOREIGN APPLICATION PRIORITY DATA, FOREIGN REFERENCES, and OTHER REFERENCES. This is very interesting!

It is also noted that US Patent number 3,632,496 is missing from the IBM Patent database. This patent is referenced by the CETI patent, and is also referenced by these recent patents in these areas: 5635038, 06/03/1997, System for electrolysis and heating of water; and 5632871, 05/27/1997, System and electrolytic cell having pure metal catalytic elements for heating a liquid electrolyte.

The CETI website also discloses that: "Preliminary research reveals that the company's power generation device is environmentally safe, producing no harmful by-products. The flow system has been under development for more than five years, and incorporates advanced polymer chemistry and thin-film electro-plating methods. CETI currently has several U.S. patents that cover the entire technology. In addition, CETI has the rights to other related technologies in the field. All of the company's research is privately funded."

THE CETI RIFEX KIT

CETI is offering a kit for researchers to purchase and test their technology. From the CETI website: "Clean Energy Technologies, Inc. (CETI) proudly announces the launch of the Patterson Power Cell™ Research Kit code-named RIFEX™ (Reaction In a Film Excited complex). For the first time, researchers in this emerging field will have the opportunity to examine and conduct research on CETI's Patterson Power Cell™ which has received several U.S. Patents and has been acclaimed as the first device to reliably demonstrate chemically assisted nuclear reactions. This device is designed to replicate the groundbreaking work conducted by George Miley at the University of Illinois and James A. Patterson of CETI Labs. From an identifiable "fingerprint" of reaction products, this system will enable scientists to witness and conduct research on nuclear reactions at low temperatures with a high degree of confidence. CETI believes this device will provide new direction in the area of nuclear physics, yielding new reaction pathways that will open the door to a technological revolution as never before imagined." (Also: See Miley, 1996).

The full contents of the RIFEX Kit are listed in Table 2.

Further data regarding this kit and the licensees that it contains can be found at biz.onramp.net/~ceti/kit.htm.

Also, additional details have been provided by Gene Mallove, courtesy of Jed Rothwell: "Licensing or leasing a Research Kit entitles one to the following: a 1-year license; a test chamber; two research cells; 4 loadings of three different microsphere (MS) configurations; ability to participate in the CETI Corporate Organization Research Program; admittance to two CETI corporate conferences per year (exclusively for people who have leased cells); monthly newsletter of research progress, edited by Prof. George Miley; access to special new microsphere configurations; and mandatory on-site training at the University of Illinois in use of the cells."

IS IT 'COLD FUSION'?

YES! It seems to be so, as it is reported in the open literature.

From the information available on the construction of the Patterson Power Cell™ micro-spheres, the materials used in the cell, the physical reactions taking place seem to be exactly those that occur in other reported 'Cold Fusion' cells of the same or similar composition.

NO! - Well, the CETI process is the same as that reported in these other cells of similar design, and

the actual physical process may actually be 'Cold Fission'! Or, it could be an entirely new phenomena that has not been accurately described yet!

The words "Cold Fusion" may be a gross misnomer of the actual physical process that is occurring, and the CETI cell is operating under the same physics as other reported similar cells.

Even as recent as November 1996, Pamela Zurer reported in C&EN: "In November the Patterson Power Cell™ was again on display, this time at the American Nuclear Society's Nuclear Technology Expo in Washington D.C. [Nov. '96] The article gave some background on Dr. Patterson and his Cell, adding that he has been recently collaborating with Dr. George Miley, professor of nuclear engineering at the University of Illinois. James Reding, President and CEO of Clean Energy Technologies (CETI), told C&EN: "We don't understand the mechanism. We're selling the kits to get the technology out into other people's labs so they can prove it is real and help us understand the novel fundamental nuclear reactions that don't produce any harmful nuclear by products." Orders for the kits, launched on November 10, had reached 60 orders within three days. Others aren't so willing to believe the research behind it. Retired nuclear physicist Richard A. Blue told C&EN, "They have simply misread the obvious presence that extended electrolysis results in a significant level of contamination of the microspheres." Blue said he has followed cold fusion for years [i.e., been a skeptic for years] and that "any knowledgeable person" can disprove the transmutation argument easily, since "the proper natural abundance ratios" are present for the transmuted metals to be considered only contaminations." (Zurer, 1996).

WHAT IS 'COLD FUSION'

A good description of what is known in the open technical literature as "Cold Fusion" is reported by Jed Rothwell in Fortean Times (Rothwell, 1996):

"The CF effect was first reported by Pons and Fleischmann in 1989. It was subsequently confirmed by several hundred laboratories, mostly in Japan, where it is now being researched by groups in most major universities, national laboratories and major corporations. In 1992 Japan's Ministry of International Trade and Industry (MITI) formed a research and development consortium with ten major industrial corporations, including Hitachi, Toshiba, Toyota, Tokyo Electric Power, and others. The number of corporate participants has now grown to 20, and last year the four year budget contribution from MITI was increased from \$25 million to \$100 million. The research is conducted under MITI's New Energy and Industrial Technology Development Organization (NEDO), which is sponsoring the Sixth International Conference on Cold Fusion in October 1996. Other major research is performed in Italy financed by corporations including the Fiat Motor Company and the government's national nuclear research laboratories (INFN)."

"CF occurs in highly loaded metal hydrides (metals with hydrogen or deuterium dissolved in them at very high concentrations). It produces heat and the transmutation of elements and isotopes. Helium and tritium are synthesized, and the host metal lattice can be transmuted in both fission and fusion reactions. CF does not produce gamma rays, intense neutrons or other signatures characteristic of plasma fusion. The reason for this remains a scientific mystery which is vigorously debated by the theorists. The CF effect has been seen in a number of different metal lattices, starting with Pd and Ti in 1989. It was later reported in Ni, Au, and in the high temperature superconductor compound Sr(CeYNb)O₃."

"There is evidence that a supersaturated Pd hydride forms a stable, superconducting compound, so perhaps all CF devices are also high temperature superconductors. Various techniques continue to be used to create saturated metal hydrides: electrochemistry, gas loading, proton conductors (gas electrolysis), ion beam, sparking, and injection by ultrasonic bubble collapse."

RELATED 'COLD FUSION' RESEARCH

There is a large international effort underway in this area, and repeatable results are being reported by various researchers in various countries. While various designs of cells are being used, the

phenomena reported are nearly the same, and include the production of excess heat in the water and transmutation of elements, or the forming of new elements, in the cathode metals used. (Fox and Bailey, 1997). REPEATABLE 'COLD FUSION' RESULTS

Jed Rothwell was present at the Sixth International Conference On Cold Fusion (ICCF6), held last October 13-18, 1996, in Japan, and has reported on several supportive and repeatable cold fusion results (Rothwell, 1996):

"In my opinion the two best papers were from Miley and Pons."

"O-019 G. Miley, "Experimental Observations of Massive Transmutations Occurring in Multilayer Thin-Film Microspheres After Electrolysis." [See Journal of New Energy, vol 1, no 3, for a similar report. - Ed.] This was similar to Miley's lecture and paper given at the Second International Low Energy Nuclear Reactions Conference (ILENR2), discussed here, and published in Infinite Energy #9. Miley showed some additional data strengthening the observations of three zones of transmutation. He explained that zones are characteristic of fission reactions. He showed data for beads with glass cores. These produced little heat and only a small number of apparent transmutations, with large sections of the spectrum flat compared to the plastic core beads. In conversation, he explained that the make up of the beads was different in each of the twenty runs. Some came from CETI while others were fabricated at the University of Illinois. Some had multiple layers of nickel and palladium, some were nickel only, and thickness was varied. He said he sees no point in doing the same experiment over and over. He wants to explore a variety of materials and thin film configurations."

"One other paper about the CETI cell was given, by McKubre:[SRI, CA, USA] O-020 "Electrochemistry and Calorimetry in a Packed-Bed Flow-Through Electrochemical Cell." This was a sophisticated analysis of the electrochemistry of a Patterson-style cell. McKubre showed that the most active and highly-loaded beads are probably those at the top of the bead pack near the anode. He concluded that the best way to scale up a Patterson cell would be to increase the diameter, making a broad, flat bead pack with just a few layers of beads. Patterson himself has reached the opposite conclusion. Before McKubre's talk, I asked Patterson how he plans to scale up his cells. Patterson said he will make them long and thin, adding many layers of beads. McKubre and Patterson should get together and hash this out."

"O-014 S. Pons, "The ICARUS 9 Calorimeter: Summary of Three Years Designing, Testing and Operation of this Device at the IMRA Europe Science Center." We will describe this paper in detail in issue #10 of Infinite Energy. The paper describes a cell that was held at boiling for long periods, producing 200% excess at hundreds of watts."

"O-055 G. Lonchamp, "Reproduction of Fleischmann and Pons Experiment." This paper was presented by Biberian because Lonchamp does not speak English well. It describes a marvelous series of experiments performed by French Atomic Energy Commission (CEREM), in association with the ENSEEG (Ecole Nationale Supérieure d'Electrochimie et d'Electrometallurgie de Grenoble). Biberian also worked on the project, although he is not listed as an author. Lonchamp is a CEREM commissioner, and an engineer not a scientist, thank goodness. These experiments are exact replications of the 1993 boil off experiments reported by Pons and Fleischmann in Physics Letters A, 176. This is exactly what cold fusion cries out for: careful, step by step replications, done by people who follow directions. Biberian said that he and the other scientists in the project wanted to incorporate various creative improvements but Lonchamp insisted on doing a precise replication with assistance from Pons and Fleischmann. That is why it worked, as Biberian cheerfully admits. It takes an engineer to do these things right. Everything about this work is superb, even the Abstract."

"P-004 S. Crouch-Baker, "Mass Flow Calorimetric Studies Under Non-Steady State Conditions." SRI also did a quality replication of the Pons-Fleischmann boil-off experiment. They used high precision equipment and extensive modeling to examine the power levels just before boiling ensues, and during boiling. The goal was to answer an interesting chicken-and-egg question. Does the heat [cause] the CF reaction, or does an increasing CF reaction cause the heat? It could be a

combination of the two, what Fleischmann calls "positive feedback between the temperature and the rate of excess enthalpy generation." SRI concluded that the cell begins to heat up because of normal electrochemical processes. The cathode surface changes, resistance rises, more power is consumed, and the temperature rises. You can accomplish the same thing with a platinum cathode. You can even drive a platinum cathode to boiling with this mechanism, but you get no excess heat. With fully loaded palladium however, the temperature rise triggers a burst of excess heat. I conclude that you should be able to trigger a CF reaction in fully loaded palladium by raising the temperature by some other means, like raising the temperature of the incoming electrolyte in a flow calorimeter, or perhaps even by heating the cathode with a laser. It would be interesting to find out if this works."

And, on commenting on the closing remarks at the conference by McKubre of SRI, McKubre stated: "What we have done in part, partly in response to our critics [skeptics, not Fleischmann], is to make calorimeters in such a way as to improve the data quality. You improve the data quality by averaging things for a long time, never changing anything. . . . so the lines on a viewgraph are very clear with few irregularities you have to explain. In doing that, of course, you maintain the system as closely as possible in a steady state. We have engineered our systems to do that. That is what flow calorimeters do well. I question, now, whether that is wise." And Rothwell writes: "Great! He questions that now, three years after Pons and Fleischmann made it abundantly clear that steady state, low temperature conditions are the kiss of death. ... It should not take three years for people to listen to advice from Pons and Fleischmann. They are the leading practitioners of this field. They have reported the biggest, best, most dramatic and important results. SRI replicated the boil-off results. Why didn't they move to build a calorimeter like ICARUS-9, with a condenser, designed to operate at continuous boiling?"

POLITICS VS. PATENTS

It is our opinion that the US Patent Office has illegally closed the door on any device that references the words "cold fusion." Over 300 patents in this area have been refused in the US, while over 100 similar patents have already been granted in Japan.

The US Patent Office also refused to allow T. Henry Moray's patent for a transistor in the 1930s, because it did not include a 'cathode!' How many other patents like these are being denied because of technical misunderstandings and/or purposeful bureaucracy or economic politics within the US Patent Office?

One solution to this problem is for an inventor to shield his device in the guise of another technology or application, in order to get the approval of the patent office. This has been done in several cases, and notably with Ken Shoulder's US Patent 5,018,180, May 21, 1991, "Energy Conversion Using High Charge Density," where the really useful information seems to be in the last 10 pages of this 80 page patent! It is also noted that this patent alone would explain the removal of alpha-type nuclear isotopes, as demonstrated in such cells, and by CETI.

It may be that CETI is purposefully removing itself from the 'Cold Fusion' area in order to gain entry into the US Patent Office.

This may be substantiated by CETI's apparent withdrawal of its papers from ICCF6 last October. Jed Rothwell was there, and reported: "Several companion papers about the CETI device were scheduled for the same hour that Miley talked, but only one was delivered. The conference organizers had scheduled one hour for the CETI session, giving Miley only 15 minutes. Other papers apparently include vital information about the CETI cell, judging by the footnotes in the Miley paper and the titles of the missing papers: "Electrical Control of New Hydrogen Energy," "Design Considerations for Multilayer Thin-Film Patterson-Type Microspheres," "Producing Excess Enthalpy . . . with Near 100% Reliability" and so on. CETI did not explain these last minute cancellations and other sudden changes in their plans. They missed a good opportunity to get their message out and excite interest in their technology, but they made up for it a month later, at the American Nuclear Society meeting in Washington." (Rothwell, 1996)

Also, from New Energy News in December 1996: "According to CEO Jim Reding, "an organization has already purchased the "exclusive world rights" to license and sub-license this patent." The organization has paid CETI \$1 million dollars (\$1,000,000) for this. The organization's identity, for now, is private. Jim Reding reports that response has been very polite. There is a lot of interest in this technology among those who were initially skeptical. I guess the sale of about 1/3 of the 40 kits at this meeting speaks for itself. It seems, at last, that cold fusion has truly been commercialized with the sale of these units with every prospect for increasing sales. As soon as other former non-involved but ranking people observe these effects with these cells, the opposition to cold fusion will be dramatically lessened, to say the least." (Rothwell, 1996).

One wonders if the removal of CETI from the 'Cold Fusion' technology area was a requirement of this purchase. Ya think?

It is one thing to mask one's technology to gain access into the US Patent Office. It is quite another thing to use that same mask to discount, to discredit, or to destroy someone else's patents in perhaps essentially the same technical area!

CETI FILING AN OBJECTION TO THE ISSUANCE OF THE PONS-FLEISCHMANN PATENTS IN EUROPE

Hal Fox has been the President of the Fusion Information Center in Salt Lake City, and has been working in the 'Cold Fusion' area for over 8 years. He has also made available what we think is the best reference collection in this field (Fox, current). He is very active in promoting the development and acceptance of the 'Cold Fusion' technology, or whatever it really is. He is also very concerned about what appears to be the attempts by CETI to discount, discredit, or destroy the patents held by Pons and Fleischmann, and also perhaps by others, in the 'cold fusion area.'

Hal Fox published this lead article in the May 1997 issue of Nuclear News, under the title "Promotion by Destruction":

"One of the heartening aspects of the development of the technology of cold fusion has been the willingness of most scientists to be mutually supportive in the presence of organized efforts to destroy cold fusion. It appears that greed, jealousy, or a naive idea of corporate strategy has now begun the destructive impact of hiring lawyers to attack competitive cold fusion inventions."

"We greatly regret to report that the Clean Energies Technologies, Inc. has directed attorneys to file an objection to the issuance of the Pons-Fleischmann patents in Europe. What can possibly be the concept behind this technology destroying decision? The background is that almost no U.S. patents on cold fusion have issued to any inventors in the U. S. except to Dr. James Patterson. By contrast over a hundred patents on cold fusion have issued in Japan. The reported reason for the Patterson patents to issue has been that he requested special treatment due to his advanced age. In addition, it is apparent that the patents do not advertise that the patent applications were cold fusion inventions."

"This editor has been among those many persons involved in the development of cold fusion technology and other enhanced-energy systems who have helped build a consortium of mutual support among many inventors, scientists, and corporate groups. This mutual support is designed to counter the intense anti-cold fusion efforts funded by U.S. scientists whose careers have been supported by taxpayer funds. The end result has been that the group seeking to destroy cold fusion has been successful in preventing the patent office from processing the over 300 patent applications and also successful in preventing the use of government funds to be allocated to cold fusion. An additional result of this attack against cold fusion has been the reduction of funds to hot fusion research by over 250 million dollars per year. Had this same group made the suggestion that just five percent of the fusion budget be applied to investigate cold fusion, there would have been great progress made by the combination of both scientific groups working in harmony. Jealousy and greed is seldom a win-win combination."

"This editor suggests that the decision by CETI management will end up being just as disastrous to the success of the Patterson Power Cell™. as the misguided efforts of the hot fusioners to try to destroy cold fusion. It is forecast that the CETI group will be lambasted and severely criticized in every publication and every group meeting of new-energy adherents except where CETI advertising dollars compromise editorial comments. Of course, those who have been attacking cold fusion will rejoice at this schism in the ranks of the cold fusion adherents. What better can the hot fusioners ask for than that the minuscule amount of funds available to the development of cold fusion be devoured by senseless internecine fighting."

"The decision by CETI has come at the same time that new discoveries and new inventions have been announced, or are being readied for announcement, that are highly competitive to the CETI technology. Meanwhile, we are devoted to the combined success of all new-energy groups who continue to strive to solve the world's energy problems. "

"[This Editorial was faxed to the President of CETI, and he was invited to respond in writing, to be published with this Editorial. As yet, he has not responded. Ed.]"

CLAIMS OF RADIOACTIVITY REDUCTION

Eugene Mallove, Editor of Infinite Energy Magazine, has also stated: "This [CETI 1997] patent describes a method by which radionuclides are inserted into a special matrix designed for radioactive elements. According to Reding and inventor Dr. Patterson, with whom I also spoke, "conservatively" they have demonstrated the reduction by up to 50% of the radiation activity from uranium and thorium. The process takes only from 2 to 24 hours. Generally, the process occurs within only 4 hours. It is said that the de-activation can be as high as 90%, which would make for a pretty conclusive finding, I would assume. Anyone in the nuclear industry who can verify this result ought to know that we are "no longer in Kansas." In fact, the allowance of this patent by the USPTO should tell them that already." (Mallove, 1996)

The ability of the CETI cell to reduce some radioactivity was demonstrated on the ABC TV program "Good Morning America," and aired on June 10, 1997, at about 8:15 AM PDT. The program noted that a G-M (Geiger Mueller) tube was used to measure the radioactivity of thorium and uranium that had been placed into the water that was circulated within the cell. As time went on, the radioactivity detected substantially reduced, to about 1/2 of its initial value, in a relatively short period of time.

It is important to note that the most significant danger posed by nuclear waste is the penetrating 'gamma ray' radiation that occurs during the natural decay of the fission products in the nuclear reactor fuel rods, irradiated materials (like shielding), and in some isolated isotopes, such as cobalt-60. Other radiation, such as alpha and beta rays, are nothing more than charged particles (protons and electrons, resp.) that can be stopped by a piece of paper (for alphas) or in a few inches of air (betas).

It is suspected that what was measured in these experiments, and demonstrated on the TV show, was alpha radiation as detected by the G-M tube. The isotopes that produce this radiation may be being transmuted or neutralized by the large concentrations of negative charges which are known to be present in most cold fusion cells. This is the subject of the Shoulders patent, and is also the subject of a companion paper presented at this conference (Fox, 1997). This phenomena is understandable, given the results of such experiments to date.

The ability of such cells or the Patterson Power Cell™ to reduce the radioactivity of gamma ray (or beta ray) emitting nuclides is unknown, and at the present time is not expected by those familiar with these types of experiments and their results.

CONCLUSIONS

The Patterson Power Cell™ appears to operate as advertised by CETI. There is a very large amount of supportive documentation available in the public domain to support its operation and

capabilities. The ability of such cells to neutralize alpha radiation is understood. An ability to neutralize gamma or other forms of radiation remains to be seen.

ACKNOWLEDGMENTS

The assistance of the Fusion Information Center, the Institute for New Energy, and Infinite Energy Magazine is gratefully acknowledged.

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TABLE 1. CETI US PATENT 5,607,563 REFERENCES

(From patent.womplex.ibm.com/details?patent_number=5607563) [From: June 12, 1997]

U.S. REFERENCES: (No patents reference this one)

4269689	Agladze	May 1, 1981	Electrolyzer for conducting electrolysis therein
5318675	Patterson	June 1, 1994	Method for electrolysis of water to form metal hydride
3888756	Teshima et al	June 1, 1975	Apparatus for treating water containing impurities
5036031	Patterson	July 1, 1991	Metal plated microsphere catalyst
4943355	Patterson	July 1, 1990	Improved process for producing uniformly plated microspheres
3632496	Patterson	Jan. 1, 1972	Reagent Generator
4316786	Yu et al.	Feb. 1, 1982	Apparatus for electroplating particles of small dimension
5372688	Patterson	Dec. 1, 1994	System for electrolysis of liquid electrolyte
4913779	Lacoste	Apr. 1, 1990	Process and installation for electrolysis by percolation across one or several porous volumic electrodes

RELATED U.S. APPLICATIONS: none

FOREIGN APPLICATION PRIORITY DATA: none

FOREIGN REFERENCES: none

OTHER REFERENCES: none

PRIMARY/ASSISTANT EXAMINERS: Valentine; Donald R.;

ADDED TO DATABASE: Mar. 5 , 1997 Last modified: May 13, 1997

TM

From biz.onramp.net/~ceti/kit.htm [From: June 12, 1997]

Equipment

- * Two Patented Patterson Power CellsTM with Test Chamber
- * Four Thin-Film MICRELTM (Microsphere-Cell Reactor Electrode Loading)
- * Electrolyte-Li₂SO₄ (99.995% pure)
- * One Neutron Activation Analysis

Research License

- * One Year Research License to Patent Technology
- * Preferred Licensing Renewal Terms

Training

- * One Day On-Site Training Seminar
- * Operational Protocol Provided by CETI
- * Technical Support from CETI and other Research Affiliates
- * Access to Information Network

Research Affiliates Program

- * One Year Membership in CETI's Corporate/Research Affiliates Program
- * One Year Subscription to Published Newsletter with Updates from other Research Affiliates
- * Free Entrance and Participation in Two CETI Research Conferences
- * Replacement Parts Catalog with Special Discounts from CETI
- * Special Order Microsphere Configurations Available
- * Research Affiliate Program Members have the Opportunity to Purchase Bulk Quantities of Microsphere Electrodes

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Oct. 20, 1997.