Contact:
Michael Bernstein
m_bernstein@acs.org
415-978-3504 (Meeting, March 21-25)
202-872-6042 (Before March 21)

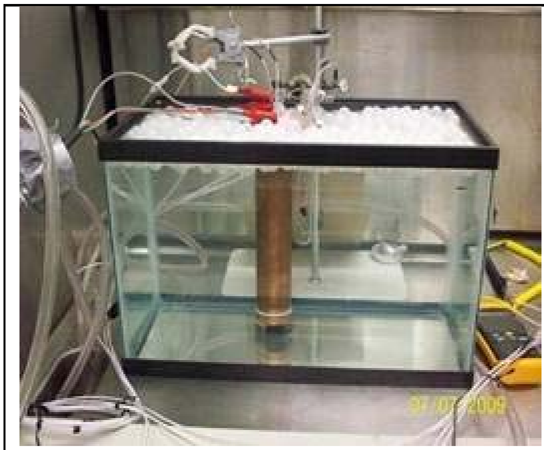
Michael Woods
m_woods@acs.org
415-978-3504 (Meeting, March 21-25)
202-872-6293 (Before March 21)

EMBARGOED FOR RELEASE: Sunday, March 21, 11:40 a.m., Eastern Time

Note to journalists: Please report that this research was presented at a meeting of the American Chemical Society. A press conference on this topic will be held at [TC].

"Cold fusion" moves closer to mainstream acceptance

SAN FRANCISCO, March 21, 2010 — A potential new energy source so controversial that people once regarded it as junk science is moving closer to acceptance by the mainstream scientific community. That's the conclusion of the organizer of one of the largest scientific sessions on the topic — "cold fusion" — being held here for the next two days in the Moscone Center during the 239th National Meeting of the American Chemical Society (ACS).



A new "calorimeter," shown immersed in this water bath, provides the first inexpensive means of identifying the hallmark of cold fusion reactions: the production of excess heat.
Credit: Melvin Miles
Click for high-resolution version

"Years ago, many scientists were afraid to speak about 'cold fusion' to a mainstream audience," said Jan Marwan, Ph.D., the internationally known expert who organized the symposium. Marwan heads the research firm, Dr. Marwan Chemie in Berlin, Germany. Entitled "New Energy Technology," the symposium will include nearly 50 presentations describing the latest discoveries on the topic.

The presentations describe invention of an inexpensive new measuring device that could enable more labs to begin cold fusion research; indications that cold fusion may occur naturally in certain bacteria; progress toward a battery based on cold fusion; and a range of other topics. Marwan noted that many of the presentations suggest that cold fusion is real, with a potential to contribute to energy supplies in the 21st Century.

"Now most of the scientists are no longer afraid and most of the cold fusion researchers are attracted to the ACS meeting," Marwan said. "I've also noticed that the field is gaining new researchers from universities that had previously not pursued cold fusion research. More and more people are becoming interested in it. There's still some resistance to this field. But we just have to keep on as we have done so far, exploring cold fusion step by step, and that will make it a successful alternative energy source. With time and patience, I'm really optimistic we can do this!"

The term "cold fusion" originated in 1989 when Martin Fleishmann and Stanley Pons claimed achieving nuclear fusion at room temperature with a simple, inexpensive tabletop device. That claim fomented an international sensation because nuclear fusion holds potential for providing the world with a virtually limitless new source of energy. Fuel for fusion comes from ordinary seawater, and estimates indicate that 1 gallon of seawater packs the energy equivalent of 16 gallons of gasoline at 100 percent efficiency for energy production. The claim also ignited scepticism, because conventional wisdom said that achieving fusion required multi-billion-dollar fusion reactors that operate at tens of millions of degrees Fahrenheit.

When other scientists could not reproduce the Pons-Fleishmann results, research on cold fusion fell into disrepute. Humiliated by the scientific establishment, their reputations ruined, Pons and Fleishmann closed their labs, fled the country, and dropped out of sight. The handful of scientists who continued research avoided the term "cold fusion." Instead, they used the term "low energy nuclear reactions (LENR)." Research papers at the ACS symposium openly refer to "cold fusion" and some describe cold fusion as the "Fleishmann-Pons Effect" in honor of the pioneers, Marwan noted.

“The field is now experiencing a rebirth in research efforts and interest, with evidence suggesting that cold fusion may be a reality.” Marwan said. He noted, for instance, that the number of presentations on the topic at ACS National Meetings has quadrupled since 2007.

Among the reports scheduled for the symposium are:

· Michael McKubre, Ph.D., of SRI International in Menlo Park, Calif., provides an overview of cold fusion research. McKubre will discuss current knowledge in the field and explain why some doubts exist in the broader scientific community. He will also discuss recent experimental work performed at SRI. McKubre will focus on fusion, heat production and nuclear products. [*3pm, Monday March 22, Cyril Magnin*]

· George Miley, Ph.D., reports on progress toward a new type of battery that works through a new cold fusion process and has a longer life than conventional batteries. The battery consists of a special type of electrolytic cell that operates at low temperature. The process involves purposely creating defects in the metal electrode of the cell. Miley is a professor at the University of Illinois in Urbana and director of its Fusion Studies Lab. [*11am, Sunday March 21, Cyril Magnin I*]

· Melvin Miles, Ph.D., describes development of the first inexpensive instrument for reliably identifying the hallmark of cold fusion reactions: Production of excess heat from tabletop fusion devices now in use. Current ”calorimeters,” devices that measure excess heat, tend to be too complicated and inefficient for reliable use. The new calorimeter could boost the quality of research and open the field to scores of new scientists in university, government, and private labs, Miles suggests. He is with Dixie State College in St. George, Utah. [*2.30pm, Sunday March 21, Cyril Magnin I*]

· Vladimir Vysotskii, Ph.D., presents surprising experimental evidence that bacteria can undergo a type of cold fusion process and could be used to dispose of nuclear waste. He will describe studies of nuclear transmutation — the transformation of one element into another — of stable and radioactive isotopes in biological systems. Vysotskii is a scientist with Kiev National Shevchenko University in Kiev, Ukraine. [*11.20am, Monday March 22, Cyril Magnin I*].

· Tadahiko Mizuno, Ph.D., discusses an unconventional cold fusion device that uses phenanthrene, a substance found in coal and oil, as a reactant. He reports on excess heat production and gamma radiation production from the device. “Overall heat production exceeded any conceivable chemical reaction by two orders of magnitude,” Mizuno noted. He is with Hokkaido University in Japan, and wrote the book *Nuclear Transmutation: The Reality of Cold Fusion*. [*3pm, Sunday March 21, Cyril Magnin I*]

· Peter Hagelstein, Ph.D., describes new theoretical models to help explain excess heat production in cold fusion, one of the most controversial aspects of the field. He notes that in a nuclear reaction, one would expect that the energy produced would appear as kinetic energy in the products, but in the Fleischmann-Pons experiment there do not appear energetic particles in amounts consistent with the energy observed. His simple models help explain the observed energy changes, including the type and quantity of energy produced. Hagelstein is with the Massachusetts Institute of Technology. [*10.20am, Sunday March 21, Cyril Magnin I*].

· Xing Zhong Li, Ph.D., presents research demonstrating that cold fusion can occur without the production of strong nuclear radiation. He is developing a cold fusion reactor that demonstrates this principle. Li is a scientist with Tsinghua University in Beijing, China. [*9.10am, Sunday March 21, Cyril Magnin I*].

Abstracts and non-technical summaries from the symposium appear below.

# # #

Presenter: Melvin H Miles, Ph.D.
Document ID: 25281
Program Area: ENVR: Division of Environmental Chemistry
Symposium Title: (ENVR049) New Energy Technologies

Title: Measurements of excess power effects in Pd/D2O systems using a new isoperibolic calorimeter

Abstract Body: Relative inexpensive isoperibolic calorimeters have been designed and constructed with the goal of obtaining a constant heat transfer coefficient that is insensitive to normal changes in the electrolyte level. The first four prototypes were constructed from copper tubing and used different insulating materials. The outer copper cylinder has a 5.1 cm (2.0 inch) diameter and a 28 cm length. The inner copper cylinder (3.2 cm x 20 cm) is completely separated from the outer cylinder by the insulating material. The glass electrochemical cell (2.5 cm x 20 cm) positioned inside the inner copper cylinder contains 50 mL of electrolyte and has two thermistors positioned on opposite sides of the outer wall of the glass cell. Thermal contact between the glass cell and the inner copper tube is provided by Mobil 1 (5W-30W) motor oil (50 mL) as a heat conducting fluid. This calorimetric design provides for high cell operating temperatures. The heat transfer coefficient (kC) for Cell B is 0.1334 W/K, the heat capacity (CpM) is 456 J/K and the time constant is 40 minutes. Measurements of excess power effects using this new calorimeter will be reported. Financial help is acknowledged by M.H.M. from an anonymous fund at the Denver Foundation via Dixie State College.

Nontechnical summary:

A new type of calorimeter has been designed and constructed to measure heat effects produced by electrochemical reactions. Although the present application for this calorimeter is the investigation of the Fleischmann-Pons Effect (FPE, cold fusion), it can also be used to study various other electrochemical reactions. For example, the extended electrolysis of a potassium nitrate solution (0.154 M KNO3/H2O) using platinum electrodes showed no heat effects other than the electrolysis of water to form hydrogen at the cathode and oxygen at the anode. There were no measureable heat effects due to electrode reactions of nitrate ions or due to recombination of the electrolysis gases. In contrast, an acidic solution containing ammonium chloride (NH4Cl) resulted in chlorine evolution and the formation of nitrogen trichloride (NCl3). An excess power effect of about 50 mW was observed due to the chemical reaction of NCl3 with the hydrogen produced at the cathode.

This inexpensive calorimeter constructed from commercial copper tubing and copper end caps contains two inner compartments in thermal contact. A glass test tube cell contains the electrochemistry. This glass cell is surrounded by Mobile-1 oil as the heat transfer fluid that contains two thermistors. This new type of calorimeter shows excellent stability for the cell temperatures and a stable heat transfer coefficient.

It is hoped that this new calorimeter will help to resolve the controversy surrounding the Fleischmann-Pons Effect.

Melvin H Miles, Ph.D.
Dixie State College
Chemistry, 1.
807 W Mamie Ave Ridgcrest,
St. George, UT, 84770
Phone: 760.375.9258
Email: melmiles1@juno.com

Presenter: George H. Miley
Symposium Title: (ENVR014) New Energy Technologies
Title: Ultra high density deuterium clusters for low energy nuclear reactions

Abstract Body: Our low energy nuclear reaction research (LENR) has embedded ultra high density deuterium “clusters” (D cluster) in Palladium (Pd) thin films. These clusters approach metallic conditions, exhibiting super conducting properties. [1] They represent “nuclear reactive sites” needed for LENR. The resulting reactions are vigorous, giving the potential for a high power density cell. Clusters are achieved through electrochemically loading-unloading deuterium into a thin metal palladium film creating local defects which form a strong potential trap where deuterium condenses into “clusters” of ~100 atoms. Research now focuses on nano-manufactured structures to achieve a high volumetric density of these trap sites. Alternately condensed deuterium inverted Rydberg 2.3-pm deuteron spacing is being studied. [2] To initiate reactions in these ultra high density deuterium clusters, efficient ways are needed to excite the deuterium via a momentum pulse. One is through pulsed electrolysis to achieve high fluxes

of deuterons hitting the clusters. [3] Another method uses ion bombardment from a pulsed plasma glow discharge. [4] Electron beam and laser irradiation represent other approaches to be explored.

[1] AG Lipson, BJ Heuser, CH Castano, A Celik-Aktas, Physics Letters A. 339 (2005) 414-423.
[2] Holmlid, Hora, Miley Yang, Laser and Part. Beams 27, 529 (2009)
[3] X. Yang, G. H. Miley, H. Hora, 2009, SPESIF-2009, AIP Conf. Proceeding, 1103, pp. 450-458
[4] A.G. Lipson, A.S. Rusetskii, A.B. Karabut, and G. Miley, J. of Experimental and Theoretical Physics, Vol. 100, No.6, pp. 1334-1349, (2005)

Nontech: My research is directed at using a new cold fusion process to process a energy release from an electrolytic cell operating at low temperature. This process is created by purposely creating defects in the metal electrode of the cell .Deuterium atoms diffusing into the electrode material from the heavy water used in the electrolyte. The deuterium atoms "pile up" in the defect region and form a very dense state that in turn undergoes nuclear reactions (in this case like the originally "cold fusion" reactions originally disclosed by Pons and Fleischmann almost 20 yrs. ago). Thus the cell generates more energy due to these energy releasing reactions than it consumes in the electrolysis process. Once further optimized and energy conversion elements, for example, thermoelectric convertors, are added, the cell can produce electricity. This would in effect represent a small "battery" that ,due to its nuclear input power processes , could have much longer lifetimes than conventional batteries. Once demonstrated for this application, many other applications would emerge requiring both smaller and larger cells that the "battery" size unit discussed here..

George H Miley, Ph.D.
University of Illinois
NPRE
216 Talbot Lab - MC234,
104 S. Wright St.
Urbana, IL, 61801
United States
Phonw: 217-3333772
Fax: 217-3332096
Email: ghmiley@uiuc.edu

Presenter: Vladimir Vysotskii, Ph.D.
Symposium Title: (ENVR050) New Energy Technologies
Title: Observation of radiation and transmutation processes of bubble cavitation in free water jet

Abstract Body: In this work we present our results on intensive cavitation-induced X-Ray radiation in supersonic water jet obtained either in free space or near the end of the water output channel. We deeply investigated the X-Ray generation during bubble cavitation at super-high pressures of water (from 200 atm up to 3000 atm). The minor part of this X-Ray radiation (Ex1 keV) was generated at the surface of the supersonic free water jet within the area of cavitation at any pressure. The energy of radiation released at the surface of the water output channel (made of stainless steel) was estimated to be Ex2 keV. In case lead covered the surface, the energy was found to be higher Ex»4.5-5 keV. The total activity of X-Ray generation was about 0.1 Ci. The different radiation phenomena were analysed and specifically detected by X-Ray photo-plates. Further experiments were combined with the cavitation-driven nuclear synthesis. The transmutation phenomena in the area of interaction of cavitating water jet at pure surfaces (e.g. made of Ag with purity 99.99%) will be presented and discussed.

Nontechnical summary: In the first work the most universal mechanism of optimization of low energy nuclear reactions on the basis of correlated states of interacting particles is discussed. We consider the preconditions and the methods of formation of a correlated coherent state of nuclei in real nuclear-synthesis systems. This mechanism provides the giant increase of Coulomb barrier penetrability (by 20...50 orders of magnitude) under conditions, very far from optimal (very low energy, high barrier), where the effectiveness of tunneling effects is negligibly small. It is shown that inexplicable high efficiency of realized nonstationary nucleosynthesis in different experiments are related to the formation of correlated states of the interacting nuclei.

In the second work the process of generation of exterior intensive controlled X-radiation formed during correlated many bubble cavitation of a fast stream of water in free space and in channel was investigated for the first time both experimentally and theoretically. Frequency of X-ray radiation depends on the composition of a radiating surface and increases with the increase of surface atom number. Different both isotope and element anomaly at interaction of caviting water stream with target were observed.

In our additional works the results of experimental and theoretical studies of effective nuclear transmutation of stable and radioactive isotopes (e.g., accelerated transmutation of reactor
Cs-137 isotope to stable isotopes of different elements) in growing biological systems are discussed and presented. These nuclear processes are examined from three different points of view—as totality of experimental facts of low energy transmutation of isotopes in growing systems, as a process analyzed from the laws and perspective of nuclear science, and as a process studied from the point of view of biochemistry of live systems.

Vladimir Vysotskii, Ph.D.
Kiev National Shevchenko Univ,
Radiophysical Dept,
Vladimirskaya St., 64,
Kiev, Ukraine ,
Phone: +380445260583
Email: viv@vhome.kiev.ua

Presenter: Peter Hagelstein
Title: Modeling excess heat in the Fleischmann-Pons experiment

Abstract Body: We review results obtained in modeling the surface electrochemistry, deuterium diffusion, phonon excitation, coherent dynamics, and helium diffusion relevant to excess heat production in the Fleischmann-Pons experiment.

Nontechnical summary: The focus of our research effort has been on models to account for excess heat in the Fleischmann-Pons experiment. In the experiments a large amount of energy is produced, and He-4 is observed, with about 24 MeV of energy measured per helium atom detected. In a nuclear reaction, one would expect that the energy produced would appear as kinetic energy in the products, however, in the Fleischmann-Pons experiment there do not appear energetic particles in amounts consistent with the energy observed. For many years we have been studying simple physical models which can take a large energy quantum (such as 24 MeV), and split it up into a very large number of smaller energy quanta (such as 50 meV) associated with an optical phonon mode. The models that result seem to be relevant to a wide variety of observations in different Fleischmann-Pons experiments, and we hope they will lead to a basic understanding of the excess heat effect.

Peter L. Hagelstein, Ph.D.
Massachusetts Institute of Technology
Department of Electrical Engineering and Computer Science
77 Massachusetts Ave
Room 36-570
Cambridge, MA, 02139
United States , 617-253-0899
PHagelstein@aol.com

Presenter: Xingzhong Li, Ph.D.
Title: Nuclear transmutation in a gas-loading D/Pd system
Abstract Body: When deuterium gas permeates through a thin palladium film, it was thought as a diffusion process only. However, after ~80 times absorption and desorption processes accompanied with permeations, nuclear transmutation was discovered on the surface of palladium film using SEM (scanning electron microscopy). At first glance, it was noticed that the macroscopic deformation of palladium was so large that the palladium film might increase its thickness while decrease its diameter of a rounded palladium film. The stress at the rounded sealing line might even cut the palladium film into two pieces: the central rounded piece and the ring-shape edge piece. SEM analysis revealed that new elements (Cu, Zn, Si, etc.) were detected in the permeation area, but there were no such elements in the original palladium film or in the ring-shape area where no permeation happened. The temperature of palladium film was much higher than that of Iwamura experiments in Advanced Technology Research Center, Mitsubishi Heavy Industries. Besides, there was no super lattice on the surface of our palladium films. Metallography analysis will be shown as well.
Nontechnical summary: China started “cold fusion” research in 1989 using gas-loading system in parallel to electrolytic cell because we believed that the necessary product is charged particle instead of neutron and gamma radiation, and energy source would be much more valuable with temperature greater than 100oC.
Our theoretical studies proved in 1995 that excess heat might not be accompanied by commensurate nuclear radiations as well. Hot fusion data justified this “cold fusion” theory, and the confirmation of 3-deuteron fusion reaction in 2008 has further supported this theory.
We are working on the detection of neutrino emission from a “cold fusion” cell to finally prove that nuclear energy without strong nuclear radiation is feasible just like the sun shine on the earth.
The best demonstration is a self-sustaining heat generator which is on the way using gas-loading technique.
The wave nature of deuterons inside the metal hydrides is the key to understand the condensed matter nuclear science, and to build the first demonstration of a “cold fusion” reactor.

Xingzhong Li, Ph.D.
Tsinghua University
Department of Physics
Room 3401
Science Building (Physics)
Beijing, China
Phone: 86-10-62784343
Fax: 86-10-62781604
Email: lxz-dmp@tsinghua.edu.cn

Presenter: Michael C. McKubre
Title: Cold fusion, LENR, CMNS, FPE: One perspective on the state of the science
Abstract Body: It has become important to clarify in non - specialist terms what is known and what is understood in the general field of so called Low Energy or Lattice Enhanced Nuclear Reactions (LENR). It is also crucial and timely to expose and elaborate what objections or reservations exist with regard to these new understandings. In essence we are concerned with the answers to the following three questions: What do we think we know? Why do we think we know it? Why do doubts still exist in the broader scientific community? Progress in the LENR field will be reviewed with primary focus on the experimental work performed at SRI by and with its close collaborators with a view to defining experiment - based non - traditional understandings of new physical effects in metal deuterides. Particular attention will be directed to the Fleischmann-Pons Effect, nuclear level heat from the deuterium-palladium, and the associated nuclear products: 4He; 3He; 3H.

Nontechnical summary:

In the last two decades as Director of the Energy Research Center (SRI), Dr. McKubre has applied himself to the discovery and application of potential new energy sources, specifically those associated with the deuterium/palladium system. He is recognized internationally in this field as an expert in the areas of PdH and PdD electrochemistry and calorimetry. Dr. McKubre has consulted for governmental agencies and private corporations on issues relating to advanced rechargeable batteries, fuel cells and stationary power generation systems on potential futures for novel energy sources.

Under the guidance of Dr. McKubre, staff of the Energy Research Center at SRI are recognized for several major contributions to the field of research now identified as the Fleischmann-Pons effect. These include the following cardinal contributions and innovations:
Postulate the importance of D/Pd loading in achieving the Fleischmann-Pons heat effect.
Demonstrate and calibrate the utility and applicability of resistance ratio methods to measure D/Pd loading.
Confirm the importance of loading and demonstrate a critical threshold of loading in producing the Fleischmann-Pons heat effect.
Confirm the existence of an initiation time delay in the Fleischmann-Pons heat effect (following Fleischmann-Pons and Bockris).

Since 1989, SRI has attempted to replicate roughly ten experimental results reported in the field of cold fusion or condensed matter nuclear science (CMNS). A reproduction protocol has been developed to maximize the chances of success and useful learning in this process.

Michael C McKubre, Ph.D.,
SRI International
Department of Materials Research
PS385, 333 Ravenswood Ave.
Menlo Park, CA, 94025
Phone: 650-859-3868
Phone: michael.mckubre@sri.com

Presenter: Tadahiko Mizuno

Title: Heat and radiation generation during hydrogenation of CH compound

Abstract Body: Securing new sources of energy has become a major concern, because fossil fuels are expected to be depleted within several decades. In some of the major wars of the 20th century, control of oil was either a proximate cause or a decisive factor in the outcome. Especially in Japan and Germany, a great deal of research was devoted to making liquid fuels from coal. In one such experiment, a large amount of excess heat was observed. The present study was devoted to replicating and controlling that excess heat effect. The reactant is phenanthrene, a heavy oil fraction, which is subjected to high pressure and high heat in the presence of a metal catalyst. This results in the production of excess heat and strong penetrating electromagnetic radiation. After the reaction, an analysis of residual gas reveals a variety of hydrocarbons, but it seems unlikely that these products can explain the excess heat. Most of them form endothermically, and furthermore heat production reached 60 W. Overall heat production exceeded any conceivable chemical reaction by two orders of magnitude.

Nontechnical summary:

The appearance of many elements on palladium electrodes after long-duration electrolysis in heavy water at high pressure, high temperature and large current density was confirmed by several analytic methods. Mass numbers as high as 208 corresponding to elements ranging from hydrogen to lead were found, and the isotopic distributions of many of these elements were radically different from the naturally occurring ones. Changes in element distribution and in their isotopic abundances took place during electrolysis in both heavy and light water, whether or not excess energy was generated. If the transmutation mechanism can be understood, it may then be possible to control the reaction, and perhaps produce macroscopic quantities of rare elements by this method. In the distant future, industrial scale production of rare elements might become possible.

Securing new sources of energy has become a major concern, because fossil fuels are expected to be depleted within several decades. In some of the major wars of the 20th century, control of oil was either a proximate cause or a decisive factor in the outcome. Especially in Japan and Germany, a great deal of research was devoted to making liquid fuels from coal. In one such experiment, a large amount of excess heat was observed. The present study was devoted to replicating and controlling that excess heat effect.

Tadahiko Mizuno, PhD

Hydrogen Engineering Application and Development Chemistry

Kita-ku Kita 13 Nishi 8

Sapporo, Hokkaido, 060-8628, Japan

Phone: 81652398564

Email: mizuno@athena.qe.eng.hokudai.ac.jp

SUMMARY:
"Cold fusion," a controversial energy source once relegated to the scientific equivalent of banishment to Siberia, is now moving closer toward acceptance by the mainstream scientific community. A special two-day symposium entitled "New Energy Technology" will include 46 oral presentations on this topic and more than a dozen posters — among the largest presentations of their kind to date — March 22-23 at the American Chemical Society's 239th National Meeting.

KEYWORDS:
Chemistry/Physics/Materials Sciences; Technology/Engineering/Computer Science; Biology; Energy/Fuel.