# FUSION Facts

A Monthly Newsletter Providing Factual Reports On Cold Fusion Developments

*ISSN 1051-8738* • University of Utah Research Park •

*Fusion Facts* Now Reports on Both Cold Fusion and Other Enhanced Energy Devices.

VOLUME 4 SPECIAL ISSUE FUSION FACTS NOVEMBER 1992


## REPORT FROM NAGOYA CONFERENCE

### DRAMATIC DISCOVERIES ANNOUNCED AT COLD FUSION CONFERENCE.

The First Annual Conference on Cold Fusion was held in Salt Lake City, Utah on March 28-31, 1990. Although this conference was dubbed as a "seance of faithful believers gathering around the dead corpse of cold fusion", the many papers presented, most of them positive, gave strong indications that cold fusion was indeed a new science. However, the conference attendees pretty well agreed that improved methods of experiment and better measurements of nuclear byproducts were needed.

The Second Annual Conference on Cold Fusion was held in Como, Italy on June 29-July 4, 1991. At this conference nearly all papers were positive; there were few negative reports; and the conference appeared to convince the attending scientists that cold fusion had become a science. The results of the conference were published in a book called, 'The Science of Cold Fusion, Proceedings of the II Annual Conference on Cold Fusion'.

The Third Annual Conference on Cold Fusion was held in Nagoya, Japan on October 21-25, 1992 and will probably mark the turning point for media acceptance of cold fusion as a new science.

The major events at this conference were the following:

### 1. VIDEO FROM PONS AND FLEISCHMANN.

Drs. Stanley Pons and Martin Fleischmann, who were the original discoverers that cold fusion could produce excess heat, and who made their announcement on March 23, 1989, were present at the conference. They showed a videotape taken of four tall electrochemical cells in which a small palladium cathode would "turn on" and produce sufficient energy that the entire contents of the electrochemical cells reached boiling point and were entirely evaporated from the energy produced by the small piece of palladium. This videotape presentation was very dramatic. As one could see, each of the four cells "turned on", and boiled the contents dry during the time lapsed video presentation. It was stated by Dr. Pons that the calculated excess heat from these cells amounted to about 1,000 watts per cubic centimeter of the palladium alloy that they used.

### 2. YAMAGUCHI ANNOUNCES REPLICATION OF NEUTRON IN HEAT BURSTS.

Dr. Yamaguchi had previously announced the experiments in which a thin wafer of palladium was coated on one side with gold so that no deuterium or hydrogen atoms could escape through that gold layer, on the other side the wafer was covered with a thin layer of mangenese oxide. This oxide layer slows down but does not entirely stops the migration of deuterium atoms out of the palladium wafer.

In the experimental set up the wafer is exposed to deuterium gas under pressure and then later exposed to a vacuum so that the deuterium residing in the palladium metal attempts to flow out toward the low pressure vacuum. Under appropriate conditions, and triggered by an electric charge, the escaping deuterium is apparently caused to fuse, producing a large amount of excess heat and also producing a burst of neutrons. The production and measurement of the neutron burst is strong evidence for the existence of nuclear reactions in the palladium wafer. Dr. Yamaguchi works for NTT (Nippon Telephone & Telegraph). It is interesting to note that immediately following a press conference held in Tokyo by Dr. Yamaguchi the stock in NTT rose a reported 9.9%. This dramatic increase in the price of NTT stock

caused financial circles in London to send a Reuter's reporter in Japan to the meeting of the Cold Fusion scientists to find out what was going on. It was later reported by the *Financial Times* "We (England) should have been in cold fusion all this time."

## 3. COLD FUSION USING LIGHT WATER.

The Pons-Fleischmann effect is obtained by the use of a palladium cathode immersed in electrolytic solution based on heavy water. Heavy water is composed of hydrogen that is twice as heavy as normal hydrogen, having an excess neutron in the nucleus of the hydrogen atom. Ordinary, or light water has just a single nucleus, which is normal for ordinary hydrogen. An electrochemical cell based on the use of light water, a nickel cathode, and potassium carbonate as the electrolyte is producing excess heat for many new experimenters. The first demonstration of this type of cell that could produce excess heat was announced by Dr. Randell Mills of Lancaster, Pennsylvania. Subsequently, Drs. Bush and Eagleton of Cal Poly, Pomona, also replicated the Mills work after some changes.

A copy of the December 1991 paper, prepared by Dr. Robert T. Bush, was sent to both Dr. Srinivasan in India and to Dr. Mizuno at Hokkaido University in Japan. This paper, a preprint of a paper later published in the September issue of *Fusion Technology*, stirred considerable interest in scientists both at the Bhabha Atomic Research Centre in India and at the Hokkaido University in Sapporo, Japan. Dr. Srinivasan reported work accomplished by four different teams of scientists at the BARC research facility. He stated that all but one light-water cell had produced excess heat ranging from 30% to 70%. Dr. Reiko Notoya, a female professor at Hokkaido University, also presented a paper in which she reported that some of her light-water cells produced more than 300% excess heat. In a poster session Drs. Bush and Eagleton not only reported on their successes in using the light-water nickel electrode cells but they even handed out samples of the special nickel cathode they used so that other experimenters could replicate their work.

## 4. RUSSIANS WORKING ON COLD FUSION.

One of the unexpected highlights of the conference was the reports by several Russian scientists of rather dramatic successes they had achieved in cold fusion experimental work. Dr. Karabut, with the "Lutch" research laboratory in Moscow reported on glow discharge plasma work using palladium electrodes and low pressure deuterium gas. Dr. Karabut's paper related that approximately 500% excess heat was measured in his experimental configuration. Because this type of cold fusion device uses no liquids to slosh around, it is anticipated that the aerospace industry will develop a considerable interest in this non-liquid device. Dr. Romodanov, from another research laboratory in Russia, also reported some excellent work with glow discharge experiments in cold fusion. It was interesting to overhear two Russians (Romodanov and Kucherov) saying to each other, "I have to come all the way to Nagoya to find out that you were working on experiments similar to those done in our laboratory." Dr. Kaliev reported on a dramatically new approach to cold fusion. Dr. Kaliev works with the Institute of Electrochemistry of the Russian Academy of Sciences. This group is headed up by Academician (a prestigious title) Alexey N. Baraboshkin. The unusual nature of this work is that the cold fusion devices in which excess heat can be developed consist of a new calcium-tungsten-oxide crystal. In preparation single crystals are drawn from a molten solution. The method of production produces many very tiny channels in the crystals. Apparently it is these channels that permit the fusion of hydrogen or deuterium gas and lead in both cases (as reported) to the development of excess heat. This is the first time that this type of crystal has been mentioned in cold fusion conferences as being able to sustain nuclear reactions.

A total of over 150 technical papers were presented at the conference, either as lectures to the audience or as poster sessions where attendees could walk around a large room and view the various pages of a paper and talk directly to and exchange information with the individual scientists presenting the paper.

Many noteworthy papers resulted from this conference. Most noteworthy was the attraction the conference seemed to have for the media. There were several media representatives from various countries present at the conference. The Japanese

press (newspaper, radio, and television people) were at the conference in relatively large numbers. Articles about the conference were printed in various publications such as The Wall Street Journal, The London Financial Times, the L.A. Times and The Salt Lake Tribune. There was a pre-conference two-page article in the October 26 issue of BusinessWeek. Many of the Japanese newspapers and newspapers out of Japan carried articles about the resurrection, or the renaissance of cold fusion. The sum of this media activity leads us to believe that the breakthrough for media acceptance of cold fusion is well under way.

The conference was not without skeptics. Dr. R. O. Morrison and Dr. John R. Huizenga (author of *Cold Fusion, The Scientific Fiasco of the Century*) were both in attendance at the Conference. Both of these gentlemen have prestigious scientific backgrounds. Both are witty, sharp, good speakers, and able to present their case against cold fusion in a very strong manner. However, there were such strong, positive papers presented at the Conference that the continued skepticism of Drs. Morrison and Huizenga has to be ignored. They are certainly correct in their skeptical approach to cold fusion. The scientific findings, especially for the recent light water experimental results do seem to be unbelievable. When Dr. Fleischmann was first told about the light water experiments he stated that if the science community found it hard to accept his discoveries they would really have a problem with the idea of nuclear reactions in light water.

## THE IMPLICATIONS FOR THE FUTURE OF COLD FUSION.

The Fourth Annual Conference on Cold Fusion will be held in Hawaii, tentatively scheduled for November of 1993. The impact of this conference is certainly expected to accomplish the following:

1. speed up the commercialization of cold fusion;
2. increase the interest of the investing community in cold fusion;
3. hasten the general acceptance of cold fusion as a new science, both among the scientists of the world and among the press who confer with local scientists to determine if the technology is real or not.

It was noted that several investors, or several potential investors, were at the conference. Their purpose was to determine if there were investment opportunities in cold fusion. A discussion with several of these potential funders for cold fusion found that they were excited about the scientific developments and they recognized that considerable experimental and development work will be required before cold fusion is a commercial reality. Representatives of Fusion Energy Applied Technology (FEAT) were present at the Conference, and they were enthusiastic about the developments. FEAT optimistically projects that they will have a working commercial prototype of a cold fusion heat reactor within nine months.

NOTE: Abstracts of papers presented at the Nagoya conference will be reviewed in the next two issues of *Fusion Facts*.