FUSION facts

A Monthly Newsletter Providing Factual Reports On Cold Fusion Developments

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PRESS RELEASE

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FUSION FACTS CLAIMS PROOF OF COLD FUSION

"COLD FUSION NOW PROVEN AS A SCIENTIFIC DISCOVERY", SAYS HAL FOX EDITOR-IN-CHIEF OF FUSION FACTS. FOUR NEW SCIENTIFIC EXPERIMENTS PROVE THAT THE DEUTERIUM-PALLADIUM SYSTEM AND THE DEUTERIUM-LITHIUM-PALLADIUM ELECTROCHEMICAL CELL PRODUCE NUCLEAR REACTIONS.

AFTER PROFESSOR STEVEN JONES AT BYU AND RAFELSKI DISCOVERED EVIDENCE OF COLD FUSION AND PUBLISHED THEIR RESULTS (Scientific American, Vol. 267, pp 84-89, July 1987) PROFESSORS PONS (U OF UTAH) AND FLEISCHMANN (The University, Southampton, England) DEMONSTRATED THE POSSIBLE COMMERCIALIZATION OF COLD FUSION.

After several years of research Pons and Fleischmann submitted their findings to the peer-reviewed *Journal of Electroanalytical Chemistry*. The ensuing dramatic interest in that paper (with the results that review copies were being faxed and mailed around the world) lead to the March 23, 1989 press conference where the world was told about nuclear fusion at near room temperatures.

The now-famous paper, "ELECTROCHEMICALLY INDUCED NUCLEAR FUSION OF DEUTERIUM." was received for review by *The Journal of Electroanalytical Chemistry*, March 13, 1989 prior to the press conference. In addition to being charged with unscientific handling of the news announcements, Pons and Fleischmann have borne the unscientific ridicules of their fellow scientists, especially from the nuclear physicists (and others) who are strongly affiliated with the $500 million annual funding of hot fusion (through the Department of Energy).

In addition to the more than 60 scientists world-wide who have duplicated one or all of the Pons Fleischmann discoveries, four new experiments have dramatically demonstrated the scientific evidence of nuclear reactions. These four discoveries or experiments were

made by Yamaguchi and Nishioka at the NTT Basic Research Labs in Tokyo, Japan (equivalent to our U.S. Bell Laboratories); C.S. Yang and others at the National Taing Hua University in Taiwan; B.Y. Liaw, P. Tao, P. Turner, and Bruce Liebert at the University of Hawaii; and Thomas Claytor at Los Alamos National Laboratory.

To understand the furor that cold fusion has caused during the past sixteen months it is necessary to recall that the previous known fusion of deuterium (a heavy form of hydrogen) occurs only at very high temperatures and/or pressures (such as found in the sun). Physicists know for a surety that such fusion events produce either neutrons or tritium (a superheavy form of hydrogen and an ingredient in H-bombs). Physicists also know that such events always occur in almost equal numbers. Therefore, based on the strong knowledge of fusion of deuterium at high temperatures and pressures such fusion MUST BE measurable by monitoring neutrons or by measuring the tritium production.

The problem: in cold fusion the amount of heat generated cannot be explained by the relatively small amount of tritium and/or neutrons. Even worse, many experimenters were unable to measure any significant amounts of neutrons, tritium, or excess heat (of course they also did not perform the experiment correctly either because it is a very difficult experiment to replicate or because few scientists have the combination of skills and experimental knowledge in such an unusual area of science). The result: Some scientists, unable to explain the laboratory findings of Pons, Fleischmann, and many others, and unable to replicate those findings convinced themselves that cold fusion experiments were mistakes, errors, or delusions.

The big challenge to the cold fusion experimenters has been: "Show us the nuclear by-products of nuclear reactions (neutrons or tritium) and/or show us that you have both heat and nuclear by-products at the same time!" The challenge has been accepted and met with dramatic results.

NEUTRONS AND HEAT - JAPAN

Drs. Yamaguchi and Nishioka of the NTT Basic Research Laboratories, Tokyo, Japan have made a remarkable experimental achievement by creating bursts of over one million neutrons per second from deuterated palladium. In the same experiment considerable heat is produced.

A gigantic burst of 1 to 2 million neutrons per second has been detected from palladium plates specially treated and loaded with deuterium in a vacuum chamber. The palladium plate is first plated on one side with gold and on the other side with a thin layer of manganese and oxygen. The manganese-oxygen layer allows deuterium to pass but at a slower rate than in the palladium. After plating, the palladium structure is allowed to soak up deuterium gas that is injected into the chamber. After a suitable soaking time, the deuterium gas is pumped out and the deuterium gas tries to leave the palladium. The

deuterium gas cannot exit through the gold layer and is slow to exit through the manganese-oxygen layer, therefore the deuterium gas collects in the thin region between the palladium and the manganese-oxygen layer. The result is an explosive release of energy, the bending of the palladium structure (due to the heat generated), and an enormous burst of neutrons.

This experiment is important because the release of such an enormous number of neutrons can only be the result of a nuclear reaction involving the deuterium gas and the palladium. This scientific experiment, as fast as it is duplicated by other scientists will assure vindication of Professor Jones measurements of neutrons and cold fusion.

TRITIUM AND EXCESS HEAT PRODUCED -- TAIWAN

Dr. C.S. Yang and his associates have replicated the Pons-Fleischmann electrochemical cell experiments with six different cells. They not only measured excess heat varying from about twenty percent to over one hundred percent excess heat but they also measured the production of tritium in those same cells. In addition, this careful series of experiments worked in all six of their experimental cells.

The impact is twofold: These scientists from Taiwan have shown that the Pons-Fleischmann work can be replicated (repeated) and that there is a definite production of tritium. Because tritium can only be produced by a nuclear reaction, scientists know that these experimental results are not chemical but they are nuclear.

Many teams of scientists have replicated the excess heat using the Pons-Fleischmann electrochemical cell approach. This work is important because it is only the second report on the simultaneous measurement of tritium and heat in the Pons-Fleischmann electrochemical cell.

NUCLEAR REACTIONS IN MOLTEN SALTS - HAWAII

The two inventors of using molten salts to demonstrate cold fusion are Dr. Bor Yann Liaw and Professor Bruce E. Liebert, both of the University of Hawaii. Their work was reported on July 23, 1990 at the Cold Fusion Symposium of the World Hydrogen Energy Conference held in Honolulu, Hawaii.

The development of their invention involves the use of the two salts: potassium chloride and lithium chloride (these compounds are similar to ordinary table salt which is sodium chloride). These two salts are melted and lithium deuteride is added to the mixture. The molten solution is placed in an aluminum container and a palladium rod is supported in the center of the molten mixture. Electricity is applied to the aluminum and to the palladium. After a suitable loading time (about 20 hours), this electrochemical cell can then produce more heat energy out than is being used to operate the cell.

The amount of excess heat produced ranges from five to twelve times the amount of energy being put into the cell from the electrical source. The entire cell operates in the range of 700 to 800 degrees F. Heat removal from such a cell would be expected to be above 600 degrees which means that a future commercial version could supply sufficient temperatures for many industrial energy uses including cooking and roasting food products.

This is an extraordinary experiment for two reasons: First it is the highest amount of excess heat that has been reported. Second, the work verifies the Pons-Fleischmann prediction that their discovery would work better at higher temperatures.

CONTROLLABLE AND REPEATABLE TRITIUM - LOS ALAMOS

Dr. Thomas Claytor has reported on a recent breakthrough in the production of tritium at the Los Alamos National Laboratory near Santa Fe, New Mexico. This new approach uses a mixture of palladium and silicon in the form of a small particle mixture. The mixture is compressed and deuterium gas is added under pressure. An electric current is used to increase the production of tritium. An unusually large amount of tritium (0.7 nanocuries per hour) is produced. The experiment has been repeated several times with similar results.

The importance of this work is threefold: First, the experiment is repeatable (which is needed to convince other scientists); second, the simultaneous measures of tritium and neutrons shows that in this cold fusion environment the fusion of deuterium does not follow the equal production of tritium and neutrons that has been so often measured at the high temperatures and pressures of hot fusion; and third, this work was performed in one of our prestigious national laboratories.