

**Memorandum**

March 27, 1989

E: ER-533  
ATTN OF:  
SUBJECT: "Fusion" in Electrolytic Charged Palladium/Deuterium


TO: OFE Staff

Mike Guinan and colleagues in the Chemistry and Materials Science Department at LLNL have done a credible detective job in ferreting out the probable facts and in explaining the observations and claims of Pons and Fleischmann at the University of Utah. Guinan and coworkers obtained about ten different press reports and an extensive tape of the University press conference. From those documents they constructed a set of data from which to work.

In short, the reported occurrence of small quantities of helium-3, tritium and neutrons could be the product of cosmic radiation induced D-D reactions, possibly with some further recoil displacement stimulated T-D or He-D reactions, with power levels in the microwatt range, if that. Experiment energy releases sufficient to vaporize the palladium receptor/anode and in other events, to cause melting of the experimental apparatus including melting of a puddle on the concrete floor can be attributed to the release of stored chemical and/or strain energy due to a large excess of D in the Pd. (This would be similar to the energy release that can occur in hydrided zirconium in fission reactor fuel clad in temperature excursions.) The excess hydrogen becomes available to react with available oxygen. The reported apparent steady state release of excess energy is most likely the release of lattice strain energy in the Pd or perhaps, decomposition of an unstable PdD complex or compound due to some variation in applied voltage or current, or perhaps, just spontaneous reaction. The more severe occurrences took place at night when the apparatus was unattended.

Guinan also ran displacement model calculations to examine the feasibility of a displacement based chain reaction initiated by cosmic radiation. Multiplication of perhaps two times is not unreasonable, but a chain reaction is not possible at atomic densities achievable in a normal solid. Finally, if the observed levels of power release of about a watt were due to D-D fusion, radiation levels of about 1-R per hr. at one meter would have existed. Needless to say, a press conference by the researchers then would not have occurred.

An LLNL memorandum on this work is in preparation.



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