Abstract Submitted
for the MAR11 Meeting of
The American Physical Society

Conventional Physics can Explain Excess Heat in the Fleischmann-Pons Cold Fusion Effect SCOTT CHUBB, Infinite Energy Magazine — In 1989, when Fleischmann and Pons (FP) claimed they had created room temperature, nuclear fusion in a solid, a firestorm of controversy erupted. Beginning in 1991, the Office of Naval Research began a decade-long study of the FP excess heat effect. This effort documented the fact that the excess heat that FP observed is the result of a form of nuclear fusion that can occur in solids at reduced temperature, dynamically, through a deuteron (d)+d?helium-4 reaction, without high-energy particles or ? rays. This fact has been confirmed at SRI and at a number of other laboratories (most notably in the laboratory of Y. Arata, located at Osaka University, Japan). A key reason this fact has not been accepted is the lack of a cogent argument, based on fundamental physical ideas, justifying it. In the paper, this question is re-examined, based on a generalization of conventional energy band theory that applies to finite, periodic solids, in which d's are allowed to occupy wave-like, ion band states, similar to the kinds of states that electrons occupy in ordinary metals. Prior to being experimentally observed, the Ion Band State Theory of cold fusion predicted a potential d+d?helium-4 reaction, without high energy particles, would explain the excess heat, the helium-4 would be found in an unexpected place (outside heat- producing electrodes), and high-loading, x?1, in PdDx, would be required.

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Infinite Energy Magazine

Date submitted: 30 Nov 2010 Electronic form version 1.4