Sporadic Neutron Production by Pressure-Loaded D/Ti Systems under High Rates of Temperature Change

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The mechanisms of low energy nuclear reactions (LENR) phenomena are poorly understood. If these phenomena are the consequence of commonly understood nuclear interactions, they should produce some nuclear byproducts such as gamma rays, neutrons, or charged particles. The unpublished results of a 1991 thermal shock experiment with high D/Ti loading observed a high rate of neutron emission while a recent attempt to recreate the 1991 results showed no evidence of neutrons produced by interactions within the D/Ti lattice. This work recreates the 1991 experiment and continues the previous recent investigation with improved methodology. In addition to control of deuterium pressure, system temperature, and duration of cryogenic exposure, this new setup also offers continuous data-logging and automated analysis routines. Although it has been suggested that the appearance of LENR phenomena is intimately related to specific characteristics of the material, the experimental system described herein has recorded anomalous numbers of neutrons on several occasions using materials of unspecified origin. Helium-3 data indicate neutrons are periodically emitted by reactions occurring within the D/Ti lattice, with a recorded maximum of 1800 neutrons per second, but these neutron releases do not appear to coincide with thermal shock events.