

INSTABILITY IN A PALLADIUM HYDRIDE SYSTEM DUE TO A FAST ELECTRICAL
PERTURBATION CAUSED BY A PULSED POWER SYSTEM

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ABSTRACT

Nanoporous palladium with a specific surface area of $29.12 \text{ m}^2 \text{ g}^{-1}$ was created using highly loaded palladium hydride wires subjected to a fast electrical pulse of energy. It was found that nanoporous palladium was created by the pulsing of palladium hydride wires at loading ratios higher than the threshold of 0.6. Each additional increase in the hydrogen loading ratio caused an accompanying increase in the surface area. Finally, a novel calorimetry technique was used to determine the relative amount of energy released from a wire during a fast, low energy pulse. Statistical analysis of the calorimetry data showed a statistical difference between the means of unloaded palladium wires when compared to $\text{PdH}_{0.72}$ and $\text{PdH}_{0.9}$, and a statistical difference when comparing the control mean to $\text{PdD}_{0.5}$ and $\text{PdD}_{0.87}$.