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Hydrogen Accumulation inside Single-Walled Carbon Nanotubes Encapsulated in a Pd Matrix A. LIPSON, Department of Nuclear, Plasma and Radiological Engineering, University of Illinois at Urbana Champaign, C. H. CASTANO GIRALDO, Department of Nuclear Engineering, Missouri University of Science and Technology, B. F. LYAKHOV, E. I. SAUNIN, A. YU. TSIVADZE, A. N. Frumkin Institute of Physical Chemistry and Electrochemistry, Russian Academy of Sciences — Palladium metal possesses the unique property of dissociating molecular hydrogen into an atomic form while simultaneously exhibiting high H-diffusivity, while single-walled carbon nanotubes (SWCNTs) have been actively explored during the last decade as an effective hydrogen storage medium. We report a study of hydrogen storage in which electrochemical hydrogen loading of this material provides reproducibly high net capacity of SWCNT (reduced to hydrogen content in the Pd matrix). The synergetic effect has been achieved by encapsulating Single-Walled Carbon Nanotubes in thin Pd layers on a Pd substrate creates resulting from the combination of the Pd and the SWCNTs properties with regards to hydrogen.

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