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Electrochemistry of single-walled carbon nanotubes (SWCNTs) supporting single palladium nanoparticles VAIKUNTH R. KHALAP, TATYANA SHEPS, ALEXANDER A. KANE, PHILIP G. COLLINS, Department of Physics and Astronomy, University of California Irvine, Irvine, CA 92697-4576 — The capabilities to produce, chemically tailor, and label point defects [1-3] provide a versatile toolkit for studying complex model systems based on SWNCTs and catalytic metals. Here, we describe experiments on individual SWCNTs with and without point defects and Pd nanoparticles. In this single particle limit, the effects of a defect on a supported Pd nanoparticle can be very clearly discerned. Electrochemical voltammetry reveals an important interplay between the Pd catalytic activity and the defect termination chemistry. In addition, conductivity measurements reveal an enormous response to H2 gas, making the devices competitive commercial H2 sensors. This research is partly supported by NSF (CBET-0729630) and a GAANN fellowship (VRK). [1] B. Goldsmith et al, *Science* **315** 77 (2007) [2] J. Coroneus et al, *ChemPhysChem* **9** 1053 (2008) [3] Y. Fan et al, *Nature Materials* **4** 906 (2005)

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