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Scanning Probe Microscopy Characterization of Electrical Properties of Bimetallic Core Shell Nanostructures REGINA RAGAN, SANGYEOB LEE, ANIKETA SHINDE, SATORU EMORI, UC Irvine — Metallic nanoparticles have shown enhanced catalytic activity compared to their bulk counterparts potentially due to changes in electronic properties at the nanoscale. Challenges in nanoscale catalysis studies include the fabrication of monodisperse nanostructures as well as a fundamental knowledge of the electronic properties at the nanometer length scale. Our group addresses these issues by fabricating dense ordered arrays of bimetallic core-shell nanostructures and characterizing structures with scanning tunneling spectroscopy and Kelvin probe force microscopy. Self assembled rare earth disilicide nanowires are used as templates for Pt and Au nanostructures on Si(001). We will present electronic characterization of these structures with nanometer scale resolution using STS and KPFM. STS measurements of RESi2 nanowires will be presented that show enhanced tunneling as compared to thin films as well as size dependant rectification ratios when comparing islands and wires of various width. KPFM is used to measure the work function of various sizes of RESi2 nanostructures providing a fundamental basis for understanding catalytic behavior in terms chemical activity of the nanostructures. KPFM data reveals a higher CPD for DySi2 nanowires than islands with $\Delta\Phi$ nanoisland-nanowire found to be 230meV.

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