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***In-situ* Inelastic Electron Tunneling Spectroscopy of Oligoaniline Molecular Junctions** HEAYOUNG YOON, MASATO MAITANI, LINTAO CAI, DAVID ALLARA, THERESA MAYER, The Pennsylvania State University — Recently, several studies have reported that self assembled monolayers of oligoaniline dimmers showed room temperature bistable switching behavior. In this talk, we will discuss the electrical and spectroscopic properties of thiol-substituted oligoaniline (OA) molecular junctions at the interface of lithographically-defined bottom metal nanowire contacts and metal nanowire top contacts. The junctions showed reproducible room temperature bistable switching with the threshold voltages of approximately ± 1.5 V and I-V(T) showed the dominant transport mechanism is coherent tunneling. Inelastic electron tunneling (IET) spectra in low and high current states were obtained at 5 K using a standard AC modulation technique to collect the second harmonic signal directly. The observed IET peaks in a plot of d2I/dV2 versus V were compared to infrared and Raman spectra for the OA self-assembled monolayers. The measurement confirms that the measured transport properties of molecular junctions are due to the intended molecule rather than process induced artifacts. In addition, the intensity change of vibrational modes of the benzene ring (185mV) and the quinon (197mV) of the OA in the low to the high current state suggest that the switching behavior is attributed to an inherent molecular feature of the OA molecules that form the junction.

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