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**Tunneling Spectroscopy of Self Assembled Monolayers of
7-Ethynyl-2,4,9-trithia-tricyclo[3.3.1.1^{3,7}]decane on Cadmium Sulfide**

ROBERT MALLIK, IVAN DOLOG, ANTHONY MOZYNSKI, Department of Physics, The University of Akron, JUN HU, Department of Chemistry, The University of Akron — Inelastic Electron Tunneling Spectroscopy (IETS) is used to record the vibrational spectrum of 7-Ethynyl-2,4,9-trithia-tricyclo[3.3.1.1^{3,7}]decane (7ETTD) adsorbed on amorphous CdS ultra-thin films. The CdS films are 3 nm thick, and are prepared by RF sputtering in argon. Sub-, to supra-monolayer surface coverage is achieved by repeatedly spin-doping 7ETTD onto the CdS films from a very dilute solution consisting of 9 mg 7ETTD/2 ml Dichloromethane/13 ml Diethylether. The resulting doped CdS films form the barrier layer in thin-film Al/barrier/Pb tunnel diodes. Forward and reverse bias IET spectra, conductance-voltage, temperature-dependent current-voltage, and low bias resistance measurements are presented. These corroborate previous data indicating that the 7ETTD layer significantly lowers the barrier height and increases the conductivity of the tunnel diode.

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