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Electron Transport through Porphyrin in Nanoscale Junctions SWATILEKHA SAHA, GUOGUANG QIAN, KIM M. LEWIS, Rensselaer Polytechnic Institute — As electronic devices become exceedingly small, incorporation of molecules as circuit elements is an attractive option due to their small size and the new functions that molecules can bring to the existing microelectronics. To realize such devices we have fabricated nanogaps of size 2-3 nm on gold wires and positioned porphyrin molecules in the gap. I-V characteristics with and without molecules in the junction is performed and signatures of molecular transport has been identified. We measure inelastic electron tunneling spectra (IETS) from molecular junctions at 4K in ultra-high vacuum to study its vibrational modes. These measurements will be compared to Raman spectra. We discuss how IETS can provide valuable insight to the metal-molecule coupling and the role ligated atoms can play in electron transport properties.

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