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**STM/S of Polydiacetylene Nanowires on Gold and Graphite** LILI WANG, RAJIV GIRIDHARAGOPAL, KEVIN KELLY, Rice University — The structural and electronic properties of 10,12-pentacosadiynoic acid (PCDA) monolayer films and polydiacetylene (PDA) nanowires on Au islands on a HOPG substrate have been studied using STM. Our results indicate that PCDA monolayer films can be formed on both HOPG and 1-2 monolayer (ML) Au islands, but arrange in small domains due to the dense Au clusters. The arrangement of PDA nanowires exhibits differences in density, length and height between Au and HOPG areas due to differing chemical and electronic interactions, which play an important role in the charge transfer between conducting polymers and electrodes in commercial devices. STM-tip induced nanowire cutting, desorption and polymerization is also observed, with the surrounding PCDA molecules restoring the packing nearly instantaneously. This implies that the interaction with Au clusters is not strong enough to weaken the intramolecular interactions that produce the reordering cascade effect, although it strongly influences the arrangement of the nanowires. Furthermore, the local work function and  $dI/dV$  images indicate electronic structure differences between PCDA monolayer films on 1 ML Au islands and those on 2 ML islands, and between PDA nanowires on HOPG and those across Au islands.

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