Abstract Submitted
for the MAR08 Meeting of
The American Physical Society

Study of p-diaminobenzene Adsorption on Au(111) by Scanning Tunneling Microscopy HUI ZHOU, ZONGHAI HU, Columbia University, Department of Physics, DAEJIN EOM, KWANG RIM, LI LIU, GEORGE FLYNN, Columbia University, Department of Chemistry, LATHA VENKATARAMAN, Columbia University, Department of Applied Physics, ALBERTO MORGANTE, Laboratorio TASC-INFM, TONY HEINZ, Columbia University, Department of Physics — From the well-defined conductivity obtained for various individual diamino-substituted molecules spanning two gold contacts, as well as from theoretical analysis [1], researchers have suggested that amines adsorb preferentially to coordinatively unsaturated surface Au atoms through the N lone pair. To understand the nature of the amine binding, we have applied ultrahigh vacuum scanning tunneling microscope (STM) to investigate the adsorption of p-diaminobenzene molecules on the reconstructed Au(111) surface. The STM topography images (taken at 4 K) show that the molecules adsorb preferentially to step edges, corresponding to sites of reduced Au atom coordination. The adsorbed molecules are found to display a distinctive orientation along the step edges. The two-lobe topographic structure of each molecule seen by STM is compatible with the previously calculated charge density of the HOMO level. [1] L. Venkataraman at el., Nano Lett. 7, 502 (2007).

Hui Zhou
Columbia University, Department of Physics

Date submitted: 03 Dec 2007 Electronic form version 1.4