Abstract Submitted
for the MAR05 Meeting of
The American Physical Society

Room-temperature single-electron transistors with individual alkanedithiol molecules KANG LUO, DONG-HUN CHAE, SUYONG JUNG, ZHEN YAO, Department of Physics, The University of Texas at Austin, Austin, TX 78712 — We present the fabrication and characterizations of single-molecule transistors consisting of individual alkanedithiol molecules. The devices are fabricated by assembling molecules between nanometer-spaced Au electrodes which are first created by the electromigration technique on top of the oxidized Al gate electrode. The measurements at 4.2 K show clear Coulomb blockade behavior with addition energies on the order of several hundred meV. There also exist additional excitations outside the blockaded region. Because of the extremely large addition energies, single-electron tunneling behavior persists even up to room temperature.

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Date submitted: 06 Dec 2004 Electronic form version 1.4