

Abstract Submitted
for the MAR07 Meeting of
The American Physical Society

Single electron behaviors of DNA-mediated Au Nanoparticle Assembly¹ SUNG-IN KIM, YOUNG-WOOK CHANG, JEONG-DO YANG, KYUNG-HWA YOO, Department of Physics, Yonsei University — We have fabricated single electron transistors (SET) using DNA-assisted assembly of Au nanoparticles and investigated electrical transport properties of fabricated devices. Most devices exhibited clear Coulomb blockade and Coulomb oscillations, indicating that DNA molecules play a role of tunneling barriers. However, in contrast to conventional single electron transistors, the different periods of Coulomb oscillations are found at different temperatures. Based on orthodox Coulomb blockade model, we propose that the temperature dependence of Coulomb oscillation period is ascribed to the temperature dependence of junction capacitances.

¹This work is supported by National Research Center for Nanomedical Technology (Grant R15-2004-024-00000-0)

Sung In Kim
Department of Physics, Yonsei University

Date submitted: 19 Nov 2006

Electronic form version 1.4