

Abstract Submitted
for the MAR11 Meeting of
The American Physical Society

Schottky diode via dielectrophoretic assembly of reduced graphene oxide sheets between dissimilar metal contacts MUHAMMAD R. ISLAM, DAEHA JOUNG, SAIFUL KHONDAKER, Nanoscience Technology Center, Department of Physics, University of Central Florida, Orlando, Florida 32826 — Reduced graphene oxide (RGO) has attracted significant attention due to its ability to produce graphene nanostructures in large quantities. It has been also considered as a promising building block for future generation of electronic and optoelectronic devices. Here we demonstrate fabrication of RGO Schottky diodes with high yield via dielectrophoretic (DEP) assembly between two dissimilar metal contacts. Titanium (Ti) was used to make a Schottky contact, while palladium (Pd) was used to make an Ohmic contact. From the current - voltage characteristics, we obtain rectifying behavior with a rectification ratio of up to 600. The ideality factor was high (4.9) due to the presence of a large number of defects. The forward biased threshold voltage was 1 V while the reverse bias breakdown voltage was - 3.1 V which improved further upon mild annealing at 200 ° C and can be attributed to an increase of work function of RGO due to annealing.

Muhammad R. Islam
Nanoscience Technology Center, Department of Physics,
University of Central Florida, Orlando, Florida 32826

Date submitted: 28 Nov 2010

Electronic form version 1.4