Abstract Submitted
for the MAR09 Meeting of
The American Physical Society

Temperature Programmed Desorption Study of Graphene Oxide
NICHOLAS CLARK, DANIEL FIELD, SIMONA RIEMAN, CARL VENTRICE, Texas State University, INHWA JUNG, DONGXING YANG, RICHARD PINER, RODNEY RUOFF, University of Texas — Graphene oxide is an electrical insulator that shows potential for use in nanoscale electronic devices. An understanding of the thermal stability of graphene oxide sheets is important since the electrical, chemical, and mechanical properties of graphene oxide will change as it is reduced at elevated temperatures. In this study, graphene oxide films were grown by deposition of an aqueous solution of graphene oxide onto oxygen plasma cleaned silicon nitride on silicon substrates. The thermal stability of these films was studied by temperature programmed desorption under ultra-high vacuum conditions up to 350 °C. The primary decomposition components of the films are H_2O, CO_2 and CO. Desorption of these components starts at ∼70 °C and is completed by ∼150°C. Coverage dependent measurements indicate that the desorption kinetics are second order. An activation energy of 162 meV for CO_2 desorption has been determined.

Carl Ventrice
Texas State University

Date submitted: 08 Dec 2008 Electronic form version 1.4