Abstract Submitted
for the MAR14 Meeting of
The American Physical Society

Raman Studies of Doped Bi2Te3 and Bi2Se3 Nanosheets[1] COURTNEY KEISER, ZHIPENG YE, CONOR DELANEY, Univ of Northern Iowa, CHEE HUEI LEE, SUKRIT SUCHARITAKUL, XUAN GAO, Case Western Reserve Univ, RUI HE, Univ of Northern Iowa — Bi2Te3 and Bi2Se3 are two representative topological insulator (TI) materials. Doping is an important way to control the bulk carrier density and surface properties of these materials. We study surface modified and doped Bi2Te3 and Bi2Se3 nanostructures by Raman spectroscopy. In Sb doped Bi2Se3 nanosheets, we found that a phase transformation in the host Bi2Se3 lattice occurs when the doping level x approaches 0.18. This is revealed by the emergence of Sb-Sb and Sb-Se bond vibrations in the Raman spectra. The phase transformation is consistent with a metal-insulator transition at x 0.20 revealed in the temperature dependent electrical transport measurement. Raman characterization of Bi2Te3 nanoplates with sulfur surface passivation will also be discussed.

[1]Supported by NSF and American Chemical Society Petroleum Research Fund

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Date submitted: 08 Nov 2013 Electronic form version 1.4