

Abstract Submitted  
for the MAR16 Meeting of  
The American Physical Society

**STM study on the surface defects of SnSe induced by thermal annealing**<sup>1</sup> TRINH THI LY, SANG-UI KIM, TAE HOON KIM, ANH TUAN DUONG, SUNGLAE CHO, Department of Physics, EHSRC, and BRL, Univ of Ulsan, S. H. RHIM, Department of Physics and EHSRC, Univ of Ulsan, JUNGDAE KIM, Department of Physics, EHSRC, and BRL, Univ of Ulsan — SnSe is a IV - VI semiconductor with 0.86 eV gap, and a single crystal SnSe usually exhibits a p-type characteristic. SnSe is one of 2D layered materials, and it has attracted researchers' attentions due to excellent physical properties for future applications. In particular, exceptionally high ZT value ( $ZT = \sim 2.6$  at 923 K) was reported for SnSe single crystal (Zhao *et al*, Nature **508** 373 (2014)). Even though many researches on SnSe have proposed the possibilities of various applications so far, surprisingly little information is available regarding the microscopic structure of SnSe surfaces. We conducted a systematic study on the surface defect of SnSe induced by thermal annealing via a home-built low temperature scanning tunneling microscopy (STM). Various defects were characterized by STM/STS, and we found that Sn vacancy is a dominating intrinsic defect. The size of vacancy was changed after annealing process in UHV at different temperatures.

<sup>1</sup>This work was supported by the National Research Foundation of Korea(NRF) [Nos. NRF-2013R1A1A1A1008724, NRF-2009-0093818, and NRF-2014R1A4A1071686]

Trinh Thi Ly  
Department of Physics, EHSRC, and BRL, Univ of Ulsan

Date submitted: 06 Nov 2015

Electronic form version 1.4