

Abstract Submitted
for the MAR16 Meeting of
The American Physical Society

Single phase growth of materials with high polar mismatch at the interface¹ MOHAMMAD SAGHAYEZHIAN, ZHEN WANG, HANGWEN GUO, GAOMIN WANG, LINA CHEN, WARD PLUMMER, JIANDI ZHANG, Louisiana State Univ - Baton Rouge, LA, 70803 — Growing thin films on polar surfaces has always been a challenge. An even greater challenge though, has been growing thin films on polar surfaces with polar mismatch at the interface. The divergence of surface free energy inhibits appearance of a sharp interface in these materials. Here for the first time, we report successful growth of LaNiO_3 on SrTiO_3 in (111) direction with correct phase. We show that by controlling the substrate's electronic and stoichiometric properties along with careful tune of thermodynamic parameters during the growth, it is possible to grow a single phase thin film of LaNiO_3 . Using RHEED, LEED, STM and TEM, we show that the interface is sharp and there is no structural discontinuity, and the surface of the film preserves its symmetry during the growth. In addition, angle-resolved core-level photoelectron spectroscopy confirms the single phase growth.

¹Supported by U.S. DOE under Grant No. DOE DE-SC0002136

Mohammad Saghayezhian
Louisiana State Univ - Baton Rouge, LA, 70803

Date submitted: 02 Nov 2015

Electronic form version 1.4