

Abstract Submitted
for the MAR07 Meeting of
The American Physical Society

Relation between electrical properties and surface morphology of indium tin oxide thin films deposited by RF magnetron sputtering
JAEWON SONG, YONG CHEOL SHIN, CHEOL SEONG HWANG, School of Materials Science and Engineering, Seoul National University — Conductive and transparent indium tin oxide (ITO) thin films are widely used for the electrode of optoelectronic devices. The surface morphology of the ITO thin films is an important feature because the transparent TFTs or OLED devices are fabricated on ITO thin films. We investigated the surface morphology and local current conduction properties along the direction normal to the surface of ITO thin films using a conductive-AFM (CAFM). ITO thin films were deposited on Si, SiO₂ and Pt substrate by RF magnetron sputtering technique. The resistivity of the films decreased with the increasing deposition temperature or working pressure. The lowest resistivity of $9.6 \times 10^{-4} \Omega \text{cm}$ was obtained at 250° and 50mTorr. ITO thin films with a thickness of 200~300 showed low surface roughness with an RMS roughness value < 10. CAFM of ITO thin films showed that the local high current conduction occurs where the surface protrusion was formed. Detailed investigation results on the correlation between the local current conduction and surface morphology and the film growth behavior will be presented.

Jaewon Song

Date submitted: 04 Dec 2006

Electronic form version 1.4