[IV-16] [초청]

The Growth of Tin Oxide Thin Films by Reactive Ion-Assisted Beam and Applications for Gas Sensors

Won-Kook Choi, Jun-Sik Cho, Hyung-Jin Jung, and Seok-Keun Koh

Division of Ceramics, Korea Institute of Science and Technology, Cheongryang P.O. Box 131, Seoul 130-650, Korea

The tin oxide thin films were grown onto Si and glass substrate by using reactive oxygen ion assisted deposition method. As-deposited films were annealed at 400 - 600 °C for 1 hr in low vacuum. Crystallinity for as-deposited and annealed samples were analyzed by XRD and surface morphology was examined by SEM. Oxygen to Sn ratios were investigated by AES and XPS. By using SnO_x , the oxidation state of tin was determined compared pure tin and stoichiometric SnO_2 powder. The valence band structure of deposited films were also determined using He II ultraviolet spectroscopy.

Based upon tin oxide films, semiconductor type gas sensor device were fabricated to apply for detecting hydrogen and inflammable gases such as CH_4 and C_3H_8. As the thickness and species of activator layer were changed, the sensitivity were measured at different concentration and temperature.