TW-P004

Synthesis and Characterization of SnO2 Thin Films Deposited by Plasma Enhanced Atomic Layer Deposition Using SnCl4 Precursor and Oxygen Plasma

이동권, 김다영, 권세훈

부산대학교 재료공학과

Tin dioxide (SnO2) thin film is one of the most important n-type semiconducting materials having a high transparency and chemical stability. Due to their favorable properties, it has been widely used as a base materials in the transparent conducting substrates, gas sensors, and other various electronic applications. Up to now, SnO2 thin film has been extensively studied by a various deposition techniques such as RF magnetron sputtering, sol-gel process, a solution process, pulsed laser deposition (PLD), chemical vapor deposition (CVD), and atomic layer deposition (ALD) [1-6]. Among them, ALD or plasma-enhanced ALD (PEALD) has recently been focused in diverse applications due to its inherent capability for nanotechnologies. SnO2 thin films can be prepared by ALD or PEALD using halide precursors or using various metal-organic (MO) precursors. In the literature, there are many reports on the ALD and PEALD processes for depositing SnO2 thin films using MO precursors [7-8]. However, only ALD-SnO2 processes has been reported for halide precursors and PEALD-SnO2 process has not been reported yet.

Herein, therefore, we report the first PEALD process of SnO2 thin films using SnCl4 and oxygen plasma. In this work, the growth kinetics of PEALD-SnO2 as well as their physical and chemical properties were systemically investigated. Moreover, some promising applications of this process will be shown at the end of presentation.

Keywords: Plasma-enhanced atomic layer deposition, SnO2 thin films, SnCl4 precursor, O2 plasma