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XPS characterization of ZnO thin films prepared by TALD
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Among the transparent conducting oxides (TCO's) like SnO_2 and In_2O_3 respectively In_2O_3:Sn (ITO), zinc oxide (ZnO) with comparable electronic and optical properties has attracted interest as an alternative due to its low cost, non-toxicity and high durability. Advances in the production of high quality films of ZnO, foster the realization of TCO based devices in optoelectronics and photovoltaics. Several approaches have been pursued for the deposition of ZnO films in which thermal atomic layer deposition (TALD) facilitates low temperature layer by layer growth for high-quality thin films. Zinc oxide films were deposited on Si (100) substrates using diethyl zinc (DEZn) as a zinc precursor and H_2O as an oxidizing co-reactant within a temperature window of 80 °C to 200 °C. The chemical composition and bonding states of the films were quantitatively determined using X-ray photoelectron spectroscopy (XPS) by decomposition of Zn2p and O1s core-level spectra. The films exhibited only a slight deviation from ideal stoichiometry with a small excess of oxygen. Also the carbon contamination dependence on the growth temperature was studied. The lowest carbon concentration was found for the sample grown at 150 °C.

Part:	DS
Type:	Poster
Topic:	Thin Film Properties: Structure, Morphology and Composition (XRD, TEM, XPS, SIMS, RBS, AFM, ...)
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