

Abstract Submitted
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Optical Properties of Sputter-Deposited Gallium Oxide Thin Films¹ SUNDAR BABU ISUKAPATI, TOM ODER, Youngstown State University — We report on studies conducted on gallium oxide (Ga_2O_3) thin films grown on c-plane sapphire substrates by RF magnetron sputtering from a 99.9% pure ceramic target. Single and poly crystalline thin films were obtained by varying the composition of Ar and O_2 gas used in the deposition; substrate temperature and post deposition annealing treatment. The optical characteristics were obtained by UV-VIS spectroscopy measurements which yielded transmission of 90 - 95%, optical bandgaps of 4.7- 4.8 eV. Structural characteristics were analyzed through x-ray diffraction measurements. A single diffraction peak at $2\theta = 37^\circ$, assigned to the (4 0 1) plane was obtained for a film annealed at 1000 °C for 1hour in N_2 atmosphere. An attempt to dope the films using Sn for n-type conductivity was made. Optical bandgaps of 6%, 9% and 10% Sn-doped Gallium oxide films were 4.72, 4.57 and 4.56 eV, respectively.

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