

Abstract Submitted
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High Quality Epitaxial ZnO Films Grown Using Magnetron Sputtering¹ TOM ODER, Youngstown State University — Zinc oxide films were sputter-deposited at 500 °C on sapphire, SiC and GaN substrates using different mixtures of Ar and O₂. Post-deposition annealing up to 900 °C in N₂ with rapid thermal processor resulted in films whose crystalline quality improved with the annealing temperature. The effects of deposition and annealing using different Ar-O₂ gas mixtures were also investigated. Films grown on sapphire in a 1:1 Ar-O₂ mixture and annealed in N₂ at 900 °C for 5 min had the best quality. Room-temperature photoluminescence spectroscopy measurements revealed a near band edge luminescence at 3.25 eV with a FWHM value of 126 meV. The two-theta XRD measurements of these films showed a peak at 34.8°, which corresponds to the diffraction from the (0 0 2) plane of the ZnO and indicates a strong c-axis orientation perpendicular to the surface at the sapphire substrate. Results from the transport properties of these films determined using Hall-effect measurements will be discussed.

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