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Optical Properties of Gallium Oxide Thin Films SUNDAR ISUKAPATI, TOM ODER, Department of Physics and Astronomy, Youngstown State University — We report studies conducted on gallium oxide films deposited using magnetron sputtering from a 99.9% pure ceramic target on sapphire substrates. Conditions varied were the process gas using different mixtures of argon/oxygen (0/100, 20/80, 50/50, 80/20 and 100/0), substrate temperature (20 °C to 850 °C) and film thickness (140 nm – 860 nm). The films were analyzed by UV-VIS spectrometry, x-ray diffraction and energy dispersive x-ray spectroscopy measurements. The optical measurements revealed high transmission of 92%- 95% and optical bandgaps of 4.4-4.9 eV. Data from the x-ray diffraction on the film deposited at 850 °C showed a characteristic peak at 18° for the oxide material.

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