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Optical Properties of Sputter-Deposited Tungsten-Doped Gallium Oxide Thin Films ERNESTO RUBIO, C.V. RAMANA, University of Texas at El Paso — Gallium oxide (Ga_2O_3) finds attractive applications in luminescent phosphors, high temperature sensors, antireflection coatings, and solar cells. With a band gap of $\sim$5 eV, Ga_2O_3 has been recognized as a deep ultraviolet transparent conducting oxide, which makes the material a potential candidate for transparent electrode applications in UV optoelectronics. In this work, effect of tungsten (W) doping on the structure and optical properties of Ga_2O_3 has been investigated. W-metal doped β-Ga_2O_3 films grown by sputter deposition by varying the sputtering power from 50-100 W to vary tungsten concentration in the films. The samples were deposited on to Si(100) and quartz substrates by keeping the growth temperature constant at 500 °C. It is seen that increasing W concentration alters the electronic structure of Ga_2O_3 while the crystal structure of β-Ga_2O_3 phase is retained. Spectrophotometry analysis indicates that the W-doped Ga_2O_3 films are highly transparent. The fundamental absorption edge shifts associated with a decrease in band gap energy. The results will be presented and discussed.

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