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Determination of band gap in epitaxial delafossite Cu oxide using optical techniques ALEJANDRO CABRERA, R. WHEATLEY, B. SEIFERT, S. WALLENTOWITZ, Instituto de Fisica, Pontificia Universidad Catolica, T. JOSHI, Physics Astronomy Department, West Virginia University, D. LEDERMAN, Department of Physics, University of California, Santa Cruz — Highly epitaxial delafossite CuFeO_2 and $\text{CuFe}_{1-x}\text{Ga}_x\text{O}_2$ films were grown using Pulsed Laser Deposition techniques. The sample thicknesses were estimated to be 21 nm, 75 nm. The estimated gallium fraction of substituted ferric atoms was $x=0.25$ for the composite sample. We present the study of the fundamental band gap(s) for each sample via observation of their respective optical absorption properties in the NIR-VIS region using transmittance and diffuse reflection spectroscopy. Predominant absorption edges measured were between 1.1eV and 3.1eV from transmittance spectra. The sample of $\text{CuFe}_{1-x}\text{Ga}_x\text{O}_2$ showed measurable absorption features located at 2.4eV and 2.8eV. This study also found evidence of changes between apparent absorption edges between transmittance and diffuse reflectance spectroscopies of each sample and it may be resultant from absorption channels via surface states. Future photoluminescence experiments are planned to determine the photo-induced semiconductor behavior of these materials. ACNOWLEDGEMENTS: This work was supported by FONDECYT 1130372 and Proyecto Anillo ACT1409 at PUC and supported in part by the WV Higher Education Policy Commission (grant HEPC.dsr.12.29) and by FAME sponsored by MARCO and DARPA (contract # 2013-MA-2382).

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