

Abstract Submitted
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Comparative study of water and carbon dioxide adsorption on CuFeO₂ and CuFe_{1-x}Ga_xO₂ highly epitaxial thin films¹ S. ROJAS², Instituto de Fisica, Pontificia Universidad Catolica de Chile, T. JOSHI, P. BORISOV³, D. LEDERMAN, Department of Physics and Astronomy, West Virginia University, Morgantown, A. L. CABRERA, Instituto de Fisica, Pontificia Universidad Catolica de Chile — Thermal programmed desorption (TPD) of CO₂ and H₂O from a 200 nm thick CuFeO₂ and 52 nm thick CuFe_{1-x}Ga_xO₂ delafossite surfaces was performed in a Ultra-high vacuum (UHV) chamber. The thin films with epitaxial quality were grown by Pulsed Laser Deposition (PLD) on Al₂O₃ (0001) substrates. The adsorption / desorption of CO₂ and H₂O process was also monitored with X-ray Photoelectron Spectroscopy (XPS) and Auger Electron Spectroscopy (AES). Our results revealed that carbon dioxide is preferentially chemisorbed by CuFe_{1-x}Ga_xO₂ over water and we observed the opposite behavior with regard to chemisorption of CO₂ and H₂O over CuFeO₂. Hydroxyls and metal carbonates were formed on the surface due to the chemisorption of H₂O and CO₂. Arrhenius plots for CO₂ and H₂O desorption were done and activation energy for desorption were obtained.

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