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Gallium Nitride Calcined with Copper Oxide: Structural and Spectroscopic Studies L. NOICE, B. SEIPEL, C. LI, P. MOECK, Department of Physics, Portland State University, P.O. Box 751, Portland, OR 97207-0751, USA , R. ERNI, Department of Chemical Engineering and Materials Science, University of California at Davis, One Shields Avenue, Davis, CA 95616, USA , A. GUPTA, Department of Materials Science, Tmfy-MSE, The Royal Institute of Technology, Stockholm, Sweden, N. BROWNING, National Center for Electron Microscopy, Lawrence Berkeley National Laboratory, Berkeley, California 94720, USA, K.V. RAO, Department of Materials Science, Tmfy-MSE, The Royal Institute of Technology, Stockholm, Sweden — Fabrication of GaN based semiconductor devices often uses transition metals such as titanium and nickel for making ohmic contacts. These metals can diffuse into the semiconductor and, thus, strongly influence the optoelectronic properties of the device. The potential of copper-doped GaN in tuning the optical properties of the semiconductor is largely unexplored. Therefore, several samples of GaN calcined with CuO in either air or nitrogen were analyzed via powder X-ray diffraction, transmission electron microscopy, energy dispersive X-ray spectroscopy, and electron energy loss spectroscopy in order to address the structural characterization of copper-doped GaN. Gallium oxide and multiple copper oxide phases were detected. Significant changes in some GaN lattice parameters and electron structure indicate incorporation of both copper and oxygen into the GaN lattice.

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