

Abstract Submitted
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The Role of Oxygen on the Nature and Stability of Eu Centers in Eu doped Gallium Nitride BRANDON MITCHELL, Department of Physics and Astronomy, University of Mt. Union, 1972 Clark Ave, Alliance, OH, 44601, USA, DOLF TIMMERMAN, ZHU WIXING, JUNICHI TAKATSU, MASAAKI MATSUDA, Division of Materials and Manufacturing Science, Graduate School of Engineering, Osaka University, Suita, Osaka 565-0871, Japan, KATHARINA LORENZ, EDUARDO ALVES, Instituto Superior Técnico, Campus Tecnológico e Nuclear, Estrada Nacional 10, P-2695-066 Bobadela LRS, Portugal, ATSUSHI KOIZUMI, YASUFUMI FUJIWARA, Division of Materials and Manufacturing Science, Graduate School of Engineering, Osaka University, Suita, Osaka 565-0871, Japan, VOLKMAR DIEROLF, Department of Physics and Astronomy, Lehigh University, 16 Memorial Dr. E, Bethlehem, PA, 18015, USA — The effects of intentional and unintentional co-doping of oxygen on the incorporation of Eu into GaN has been thoroughly investigated. A new Eu precursor that does not contain oxygen in its molecular structure was utilized, which allowed for external control of the oxygen concentration in the samples by co-doping. The optical properties of the Eu ions were found to be considerably influenced by the absence of oxygen. It was concluded that the oxygen played an integral role in the location, stability, and local defect structure around the Eu ions that were doped into the GaN host. Furthermore, there is evidence that the normally occurring O in GaN is “recycled” by the Eu ions forming stable Eu-O complexes. The formation of these Eu-O complexes appears to be more beneficial to the crystal quality and stability than either defect is on its own.

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