

Abstract Submitted
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Study of V_{Ga}^{-2} in β -Ga₂O₃ through EPR¹ CLAUDIA NARDONE, MARY ELLEN ZVANUT, SUMAN BHANDARI, University of Alabama at Birmingham — Gallium vacancies (V_{Ga}) are thought to be common defects found in Ga₂O₃. It is important to understand the interaction among defects because charge transfer can cause unwanted effects to happen when Ga₂O₃ is used in high powered devices. Many in the past have attributed problems with Ga₂O₃ to gallium vacancies without being able to observe the vacancy directly. In our work, two neutron-irradiated Ga₂O₃ samples, one as-grown and one Fe-doped, were studied using photo-induced electron paramagnetic resonance (photo EPR), so that charge transfer between various defects could be monitored. In particular, we were able to observe V_{Ga}^{-2} as well as Fe⁺³ in both samples so that potential charge transfer could be seen. The concentrations of Fe⁺³ and V_{Ga}^{-2} were studied under the illumination of various photon energies. The concentration of Fe⁺³ in both samples decreased, which was consistent with the results obtained with non-irradiated samples where V_{Ga}^{-2} was not seen. Significantly, the concentration of V_{Ga}^{-2} in both neutron-irradiated samples did not change. This suggests that the V_{Ga}^{-2} defects are not responsible for the change in the concentration of Fe⁺³ as suggested by others.

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