

## Influence of electron irradiation on the electroluminescence spectra of white InGaN light emitting diodes

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### Abstract

We analyze the influence of electron irradiation on the electroluminescence spectra of white light emitting diodes (LEDs) based on indium gallium nitride. Three different irradiation fluences, 9.90x10(15), 1.32x10(16) and 1.98x10(16) cm(-2), are studied. For all 27 samples of LEDs of the commercially available models VAOL-SGWY4, VAOL-10GWY4 and OWL-3321, we observe a significant decrease in the emission light intensity after the irradiation. Degradation of the overall light intensity is believed to be due to irradiation-induced defects which act as nonradiative recombination centres. We also study the emission intensities and the central wavelengths of the LED samples subjected to electron irradiation under conditions of different injection currents. After irradiation with the fluence 1.98x10(16) cm(-2), the blue peak located at 453 nm experiences severe degradation, so that only the yellow luminescence at 590 nm remains. This yellow band is related to radiative transitions from donor bands to the levels associated with gallium vacancies.

### Keywords

**Author Keywords:** electroluminescence; optical characterization; light emitting diodes; indium gallium nitride; injection current

**KeyWords Plus:** YELLOW LUMINESCENCE; BLUE LEDs; GAN; TEMPERATURE

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