

Abstract Submitted
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Hydrogen-carbon complexes and the blue luminescence band in GaN.¹ DENIS DEMCHENKO, Virginia Commonwealth Univ, IBRAHIMA DI-ALLO, MICHAEL RESHCHIKOV, Virginia Commonwealth University — The blue luminescence band with a maximum at 3.0 eV and the zero-phonon line at 3.33 eV (labeled BL2) is observed in high-resistivity GaN. Under prolonged ultraviolet (UV) light exposure, the BL2 band transforms into the yellow luminescence (YL) band with a maximum at 2.2 eV. Our calculations using hybrid functionals suggest that the BL2 band is related to a hydrogen-carbon defect complex, most likely $C_N O_N - H_i$. The complex creates defect transition level close to the valence band, which is responsible for the BL2 band. Under UV illumination the complex dissociates, leaving as byproduct the source of the YL band ($C_N O_N$ or C_N) and interstitial hydrogen.

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