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ASSESSMENT OF THE EXPERIMENTAL BAND GAP OF $\text{Al}_x\text{Ga}_{1-x}\text{N}$ EPILAYERS

$\text{Al}_x\text{Ga}_{1-x}\text{N}$ epilayers prepared on sapphire substrates were assessed using Fourier Transform Infrared (FTIR) reflectance spectroscopy, photoluminescence (PL) and transmission electron microscopy (TEM). The aluminium mole fraction x of 5 samples grown at the NMU, and 3 samples grown at Linköping were measured by using PL and FTIR. Formulae for the band gap of $\text{Al}_x\text{Ga}_{1-x}\text{N}$ as function of temperature were provided by Gaikwad et al, Varshni, Nam et al and Nepal et al. Calculations using the various formulae, and results compared to various proposed formulae to calculate the band gap. Excellent agreement between the samples and the theoretical formula for the band gap of $\text{Al}_x\text{Ga}_{1-x}\text{N}$ as function of mole fraction x was found, while the formula provided by Nepal et al was the closest to the experimental and Gaikwad formula values.

Apply to be considered for a student ; award (Yes / No)?

No

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NA

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