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Optical properties of InGaN layers JIELEI WANG, MUSTAFA ALEVLI, RAMAZAN ATALAY, GOKSEL DURKAYA, MAX BUEGLER, INDIKA SENEVIRATHNA, NIKOLAUS DIETZ, Physics & Astronomy Department, Georgia State University, Atlanta, GA 30303 — Optical absorption spectroscopy provides important properties of a material including fundamental absorption edge and defect structures. We use it to investigate the band gap of $\text{In}_x\text{Ga}_{(1-x)}\text{N}$ with different Gallium contents grown by HPCVD. The results have shown that a bowing parameter of $b = 2.5$ eV allows one to reconcile our results and the literature data for the band gap of $\text{In}_x\text{Ga}_{(1-x)}\text{N}$ alloys over the whole composition range. In addition, we calculate the thicknesses of the $\text{In}_x\text{Ga}_{(1-x)}\text{N}$ thin films through simulation of the transmission using a multilayer stack model. The free electron concentration in the $\text{In}_x\text{Ga}_{(1-x)}\text{N}$ thin film determined here is also found to be in good agreement with that obtained from simulations of infrared reflection measurements we carried out.

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