

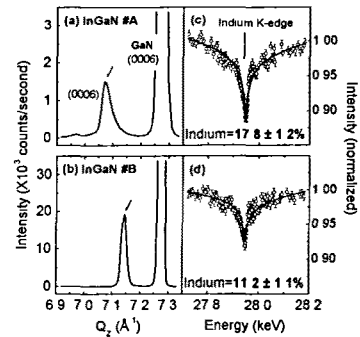
【T-13】

Determination of Indium composition of InGaN thin films and multiple quantum wells using anomalous x-ray scattering

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We have determined exact amount of indium composition in crystalline lattice of InGaN thin films and InGaN/GaN multiple quantum wells using anomalous x-ray scattering (AXS) experiment at In K-edge (27.94keV). AXS utilizes the fact that the scattering cross-section of a specific atom changes anomalously as the energy of the probing x-rays varies across its absorption edge. This method, although difficult to apply, provides exact composition of thin films independent of their strain status. AXS spectra were measured at (0006) InGaN Bragg peak due to clear peak separation between InGaN and GaN. The value of InGaN thin films ($x \leq 0.2$) was compared to one obtained from regular x-ray diffraction analysis with in-plane strain. Diffraction analysis shows that this value is consistent with AXS result at Poisson's ratio, $\nu \approx 0.23$. The composition and width of thin InGaN well layer in multiple quantum wells were also determined.



[References]

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