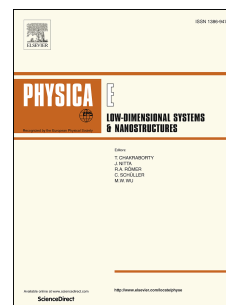


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Anomalous emission from oxygen incorporated GaN nanowires

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Abstract

In this work, anomalous optical emission in oxygen incorporated GaN nanowires has been reported. Oxygen incorporated GaN nanowires were grown by vapor-liquid-solid mechanism using chemical vapor deposition technique. Two types of oxygen incorporated GaN nanowires samples were demonstrated through high resolution transmission electron microscopy, scanning transmission electron microscopy and photoluminescence measurements. In one type of GaN nanowires having higher oxygen incorporation shows upward change in bandgap energy of GaN while the other type nanowires show downward change in bandgap energy of GaN. Changes in optical emission from oxygen incorporated GaN nanowires are explained by Moss-Burstein effect and bandgap renormalization.

Keywords: Nanowire; Oxygen incorporated Gallium Nitride; Chemical Vapor Deposition; Photoluminescence.

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