수직 배향된 Ga-doped ZnO nanorods의 합성과 전기적 특성

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Ga-doped ZnO nanorod arrays grown by thermal evaporation and their electrical behavior

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Abstract : Vertically well-aligned Ga-doped ZnO nanorods with different Ga contents were grown by thermal evaporation on a ZnO template. The Ga-doped ZnO nanorods synthesized with 50 wt % Ga with respect to the Zn content showed maximum compressive stress relative to the ZnO template, which led to a rapid growth rate along the *c*-axis due to the rapid release of stored strain energy. A further increase in the Ga content improved the conductivity of the nanorods due to the substitutional incorporation of Ga atoms in the Zn sites based on a decrease in lattice spacing. The *p-n* diode structure with Ga-doped ZnO nanorods, as a *n*-type, displayed a distinct white light luminescence from the side-view of the device, showing weak ultraviolet and various deep-level emissions.

Key Words : Ga-doped ZnO; Nanorods Thermal evaporation Diode Catalyst free