**G-6**

**Electrochemical Potentiostatic Activation & Its Application for Enhancing blue LED Efficiency**

김봉준, 김학준, 이영곤, 백광선, 이준기†, 김진혁, Karthikeyan Giri Sadasivam

전남대학교 신소재공학과

(junekey@jnu.ac.kr†)

A novel electrochemical potentiostatic method has been examined in order to enhance the hole concentration of p-type GaN thin films using KOH and HCl electrolyte.

The hole concentration was increased more than 2 times by the electric voltage apply with the mobility of $10^{-12} \text{cm}^2/\text{V.s}$.

At optimum condition of 3V apply, hole concentration was enhanced more than reference sample from $1.7 \times 10^{-17} \text{cm}^{-3}$ to $4.1 \times 10^{-17} \text{cm}^{-3}$.

Application of this activation method to blue-LED fabrication improved optical output from 18.4mW to 20.6mW, that is ~12% increase.

SIMS analysis indicates that nearly 70% of hydrogen atoms could be removed by this method.

**Keywords:** electrochemical, p-GaN, Activation

---

**G-7**

**Antimony Surfactant Effect on p-GaN growth by Metal Organic Chemical Vapor Deposition (MOCVD)**

이영곤, Karthikeyan Giri Sadasivam, 백광선, 김봉준, 김학준, 이준기†

전남대학교 신소재공학과

(junekey@chonnam.ac.kr†)

An improvement in the optical and structural properties of p-GaN was obtained by using antimony (Sb) as a surfactant during p-GaN growth. Two different growth temperatures of p-GaN such as 1030°C and 900°C were considered. Keeping the growth conditions for p-GaN constant, Sb was introduced during p-GaN growth while varying the $\text{[Sb]/([Ga]+[Mg])}$ flow ratio. $\text{[Sb]/([Ga]+[Mg])}$ flow ratio will be denoted as SGM ratio for convenience. SGM ratio of 0, 0.015 and 0.03% were considered for high temperature p-GaN growth. SGM ratio of 0, 0.005, 0.01 and 0.02% were considered for low temperature p-GaN growth. The analysis results suggest that using the optimum SGM ratio during p-GaN growth greatly improves the optical and structural properties of the p-GaN

**Keywords:** P-GaN, surfactant, antimony