P-67

Si_3N_4막으로 보호된 GaN의 급속 열처리효과
(Effect of rapid thermal annealing on GaN capped with Si_3N_4 layer)

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The effect of rapid thermal annealing (RTA) on GaN films capped with Si_3N_4 layer was investigated. Each of GaN films capped without and with Si_3N_4 was annealed with various times at temperature of 800, 900, 1000°C.

After RTA, GaN films capped with Si_3N_4 were compared with *no capping* GaN films. The Si_3N_4 capping layers were removed by BOE(buffered oxide etchant) after heat treatment.

Hall measurement, double crystal X-ray diffraction (DCXRD) and Raman spectroscopy were used to monitor the changes in electrical and structural properties.

The carrier concentration of the GaN films with Si_3N_4 capping was decreased and the carrier mobility was increased, whereas the carrier concentration of GaN film without Si_3N_4 capping was increased and the carrier mobility was decreased. This result clearly showed that improved Hall mobility and carrier concentration was resulted from the protection of Si_3N_4 capping.

Judging from these results, it can be concluded that the Si_3N_4 cap layer plays an important role in preventing the dissociation of GaN.

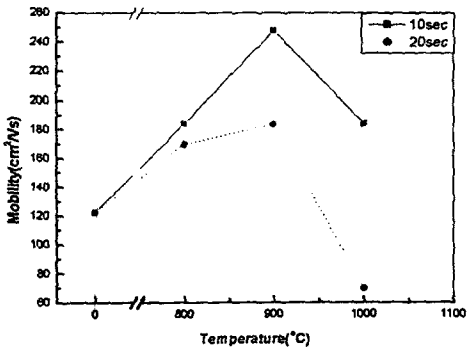

fig1. Hall measurement results of GaN as a function of Temperature