

カソードルミネッセンスによる *m* 面 GaN の積層欠陥に関する評価

Cathodoluminescence study on the stacking faults of *m*-plane GaN

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GaN growth of non-*c*-plane orientations (e.g. *a*-plane, *m*-plane) attracted more and more attention due to the spontaneous polarization and an additional stress-induced piezoelectric field along the *c*-axis, which have negative impact on the performance of light emitting devices. Stacking faults (SFs) in GaN are considering as minor defects and not so detrimental for application of *c*-plane GaN. However, if non-*c*-plane GaN is applied, SFs should be taken into account for device fabrication. The characterization of SFs of *a*-plane GaN have been widely reported, but few in *m*-plane GaN.

In our study, we have characterized SFs in *m*-plane GaN by spatially resolved cathodoluminescence (CL) at low temperature (10 K) and high-resolution transmission electron microscope (HRTEM). The emissions of different type SFs and the recombination enhanced defect reaction (REDR) were observed. The emission energy of *I*₁ type SFs is unique 3.43eV as well known, but that of *I*₂ type SFs are varied at range of 3.38 to 3.39eV. This emission energy shift of *I*₂ type SFs indicates the relatively complicated SFs structure.

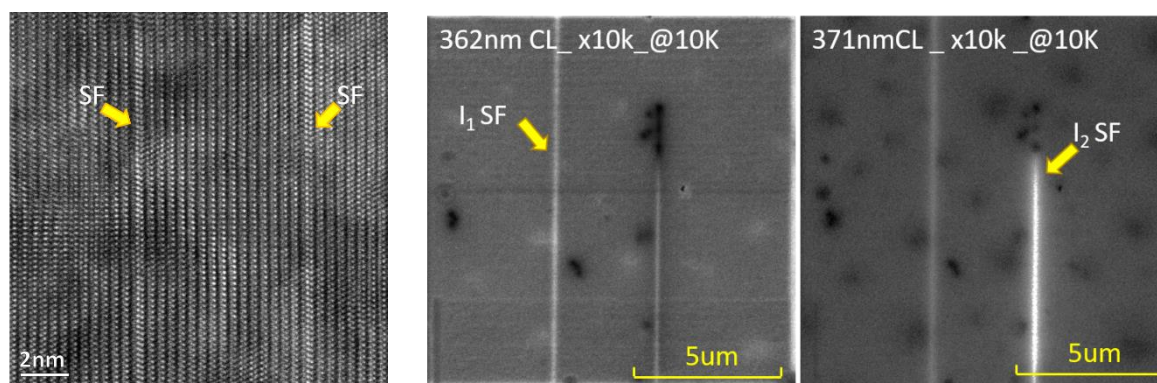


Fig. 1 High-resolution transmission electron microscopy (TEM) image of *m*-GaN along the $[11\bar{2}0]$ zone axis at room temperature; Top-view CL mapping taken at wavelengths of 362nm and 371nm, respectively.

Acknowledgement

This research was supported by the MEXT Program for research and development of next-generation semiconductor to realize energy-saving society.