Sensors and Materials, Vol. 25, No. 3 (2013) 177–187
MYU Tokyo

S & M 0912

Assessment of Stacking Faults in Silicon Carbide Crystals

Hidekazu Yamamoto*

Faculty of Engineering, Chiba Institute of Technology,
2-17-1 Tsudanuma, Narashino, Chiba 275-0016, Japan

(Received September 24, 2012; accepted November 5, 2012)

Key words: silicon carbide (SiC), staking fault, X-ray topography, photoluminescence (PL), mirror electron microscopy (MEM), atomic force microscopy (AFM)

X-ray topography, photoluminescence (PL) spectroscopy, mirror electron microscopy (MEM), and atomic force microscopy (AFM) were employed to evaluate stacking faults in silicon carbide (SiC) crystals. The results reveal that transmission X-ray topography can be used to assess internal stacking faults in crystals, while PL spectroscopy and MEM can be used to assess stacking faults near the surface. The stacking faults assessed by these different methods were found to be the same. AFM revealed that sites where stacking faults were exposed on the surface had microscopic level differences of about 0.1 nm, which are thought to be generated by different etch rates during mirror polishing.

*Corresponding author: e-mail: yamamoto.hidekazu@it-chiba.ac.jp