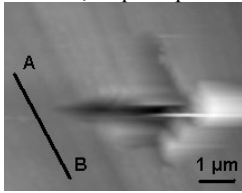


The Investigation of Crack Propagation in Cleavage Directions on the Surface of SiC by Sclerometry

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The SiC crystals have been scratched using SPM-Nanoindenter Nanoscan [1]. The studied samples represent thin hexagonal plates with the natural grown surface. The values of hardness have been measured for “Si” (23 ± 3 GPa) and “C” (34 ± 4 GPa) sides of the H6-SiC samples with nitrogen impurity of $1 \times 10^{18} \text{ cm}^{-3}$. The effect of microcracks along the cleavage direction $\{1\bar{1}00\}$ (marked AB) occurs with the load about 10 mN, that is shown on the image. Secondary microcracks propagate from the cracks in direction of secondary cleavage $\{11\bar{2}0\}$. The width of cracks is in range of 300-600 nm, depth up to 60 nm. The cracks are developed during the scratching with the “face forward” indenter arrangement. The direction “edge forward” does not develop scratches with cracks, but the effect of periodic pile-up’s is present. The period is in range of 300-600 nm for given loads. The samples have been turned to achieve various direction of scratching. The differences found between the behaviours of cracks around the scratches made in various directions and different indenter orientations.



[1] Blank V., Popov M., Lvova N., Gogolinsky K., Reshetov V., *J. Mater. Res.*, 1997, **12**, 3109.

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