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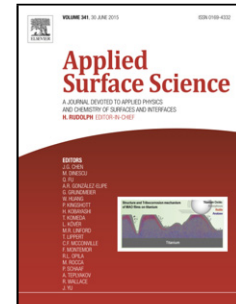

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Authors: Hui Deng, Nian Liu, Katsuyoshi Endo, Kazuya Yamamura

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ACCEPTED MANUSCRIPT

Atomic-scale finishing of carbon face of single crystal SiC by combination of thermal oxidation pretreatment and slurry polishing

Hui Deng [1)], Nian Liu [1)], Katsuyoshi Endo [2)] and Kazuya Yamamura [2)]

[1] Department of Mechanical and Energy Engineering, Southern University of Science and Technology. No. 1088, Xueyuan Road, Shenzhen, Guangdong 518055, China

[2] Research Center for Ultra-precision Science and Technology, Graduate School of Engineering, Osaka University, 2-1 Yamadaoka, Suita, Osaka 565-0871, Japan

Author to whom correspondence should be addressed.

Electronic address:

Deng Hui: dengh@sustc.edu.cn

Kazuya Yamamura: yamamura@upst.eng.osaka-u.ac.jp

Highlights

- Our results revealed that CeO_2 slurry has better polishing performance compared with diamond, Al_2O_3 and SiO_2 slurries.
- Scratch removal mechanism in conventional slurry polishing has been proposed.
- An atomic-scale flat SiC surface with well-ordered atomic steps has been obtained using the proposed hybrid polishing process.

ABSTRACT

Single-crystal silicon carbide (4H-SiC) has a range of useful physical, mechanical and electronic properties that make it a promising material for fabrication of next-generation semiconductor devices. In this work, we report a hybrid polishing process combining thermal oxidation pretreatment and soft abrasive polishing to realize the damage-free and atomic-scale smooth finishing of the carbon face of 4H-SiC. By thermal oxidation pretreatment, the hardness of the carbon face has been reduced

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