

THE SAW-DAMAGE-INDUCED STRUCTURAL DEFECTS ON THE SURFACE OF SILICON CRYSTALS

Jung M. Kim, Young K. Kim*

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E-mail : kjm4061@incheon.ac.kr, *

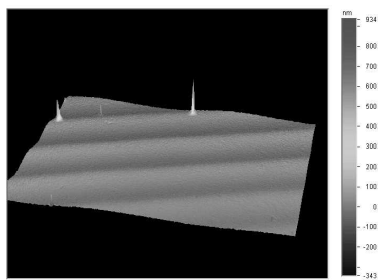
youngkim@incheon.ac.kr

Work telephone number : 82-32-770-8272 Work fax
number : 82-32-761-6658

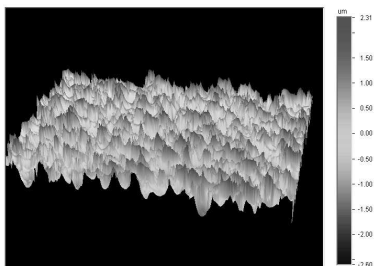
Postal address : 402-749, Department of Materials Science
& Engineering, University of Incheon, Namku, Dowha-
dong, Incheon, Republic of Korea

Abstract

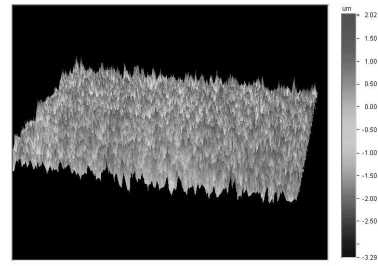
During the process of cutting silicon ingots into wafers, saw damage is produced on the surface of silicon crystals. This saw damage induces defects during the oxidation of the silicon. Unlike silica slurry wet blasting, which is known to induce OISF (Oxidation-Induced Stacking Faults), saw damage produced by the wire sawing process induces the generation of dislocation loops during the oxidation process. The type of defects formed during the oxidation process seems to depend on the amount of damage: if the damage is bigger than some critical value, then dislocation loops are generated. If the damage is smaller than this critical value, then stacking faults are generated during oxidation.



(a) Polished



(b) Caustic etched



(c) Sliced with wire saw

Fig. 1. Surface roughness of the specimen measured with Veeco metrology group NT 1000 (3D Micro vision)