

Modification of Surface Profile by means of Ion-Beam Induced Expansion Effect on Crystal Materials

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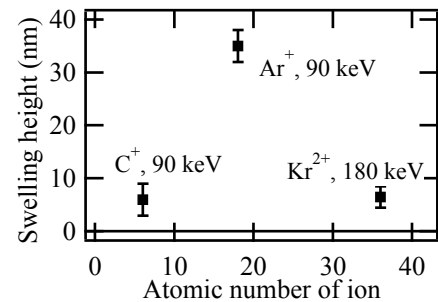
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One of the important applications of ion-beam technology is fabrication of structures in submicron scale. The importance of three-dimensional (3D) structures, which have relatively complicated surface profile, has been growing in the recent industries, such as MEMS. The expansion effect induced by ion-beam irradiation¹ is one of the hopeful processes to realize the fabrication of 3D structures. In our previous studies², the controllability of the surface profile in the vertical direction was confirmed.

In the present study, the key factors to control surface profile of crystal materials were investigated by means of the expansion effect. C, Ar, and Kr ion-beams, which were provided from ECR ion source, were irradiated on Si crystal with changing irradiation parameters. The experimental results indicate a remarkable ion dependence as shown in the figure, and the modification in the lateral direction.



References

- [1] O.W. Holland, B.R. Appleton, J. Narayan, J. Appl. Phys. 54 (1983) 2295.
- [2] J. Zhang, S. Momota et al., Nucl. Instr. and Meth. B 282 (2012) 17–20.

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1. Industrial and medical applications__

2. -----

3. -----