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Modification of glassy Carbon under Strontium ion implantation

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Abstract content
   (Max 300 words)

Diffusion, structural and surface changes of glassy carbon (Sigradur® G) due to implantation with 200keV strontium ions at room temperature are reported. The samples were implanted to a fluence of 2 ×1016 ions/cm2 at room temperature. The implanted samples were vacuum annealed at temperatures ranging from 200oC-900oC. The influence of ion implantation and annealing on surface topography was examined by the scanning electron microscopy (SEM), while Raman spectroscopy was used to monitor the corresponding structural changes induced in the glassy carbon. The depth profiles of the implanted strontium before and after annealing were determined using Rutherford backscattering (RBS).

Compared to SRIM predictions the implanted strontium profiles was broader. After annealing, diffusion of the strontium atoms took place with a significant amount of the strontium atoms migrating to the surface of the glassy carbon. Evaporation of the strontium atoms was noticed as the melting point of strontium (769oC) was approached.

The Raman spectrum showed that only some of the damage due to implantation was annealed out. Annealing at 20000C for 5 hours resulted in a Raman spectrum very similar to that of virgin glassy carbon indicating that the damage due to the ion implantation was annealed out. SEM showed large differences in the surface topography of the polished glassy carbon surfaces and those of as-implanted samples. Annealing did not significantly change the surface microstructure of the implanted samples.

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Level for award
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MSc

Main supervisor (name and email)
and his / her institution

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