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## Effect of swift heavy ion irradiation on the migration behavior of strontium implanted into polycrystalline SiC

*Thursday, 11 July 2019 15:00 (2 hours)*

The influence of swift heavy ion (SHI) irradiation on the microstructure and the strontium (Sr) migration behavior of Sr implanted into polycrystalline SiC were investigated using Rutherford backscattering spectrometry (RBS), Raman spectroscopy and scanning electron microscopy (SEM). The as-implanted and SHIs irradiated samples were vacuum annealed from 1100 to 1500 oC in steps of 100 oC for 5 hours. Implantation of strontium (Sr) amorphized the SiC, while SHIs irradiation of the as-implanted SiC resulted in limited recrystallization of the initially amorphized SiC. Annealing at 1100 oC already caused recrystallization in both the irradiated and un-irradiated but implanted with Sr samples. At 1500 oC, a carbon layer appeared on the surface of the irradiated and un-irradiated but implanted with Sr samples. This was due to the decomposition of the SiC and subsequent sublimation of silicon leaving a free carbon layer on the surface. SHIs irradiation alone induced shift of the implanted Sr toward the surface. This it may be due to the surface sputtering that caused by SHIs. Annealing the samples at 1400 oC caused a release of all implanted strontium in the SHIs irradiated samples, while 55% of implanted strontium was released in the un-irradiated but implanted with Sr samples. The enhanced Sr releasing in SHIs irradiated samples was explained in terms of the high number of pores in the irradiated samples compared fewer pores in the un-irradiated but implanted with Sr samples. The results show that more Sr was released in the irradiated SiC samples.

**Apply to be considered for a student &nbsp; award (Yes / No)?**

Yes

**Level for award&nbsp;(Hons, MSc, &nbsp; PhD, N/A)?**

PhD

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