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SHI irradiation enhanced diffusion of silver implanted into polycrystalline SiC

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Migration behavior of silver (Ag) ions implanted into polycrystalline CVD-SiC was investigated by Rutherford backscattering spectrometry (RBS), Raman spectroscopy and scanning electron microscopy. Silver ions of 360 keV were implanted into CVD-SiC to a fluence of $2 \times 10^{16} \text{ cm}^{-2}$ at room temperature. Some of implanted samples were irradiated with xenon (Xe) ions of 167 MeV to a fluence of $3.4 \times 10^{14} \text{ cm}^{-2}$ and $8.4 \times 10^{14} \text{ cm}^{-2}$ at room temperature. Both the as-implanted and implanted then irradiated samples were isochronal annealed at temperatures ranging from 1100 °C to 1400 °C in steps of 100 °C for 10 h. Raman results of the as-implanted samples showed that implantation of Ag resulted in the amorphisation of SiC, while irradiation of the as-implanted samples with Xe ions caused some recrystallization. Recrystallization was already taking place after annealing at 1100 °C in both samples. After annealing at 1400 °C, un-irradiated samples were fully recrystallized, while the irradiated samples were still not fully recrystallized. Ag started to move towards the surface without broadening after annealing at 1100 °C in the un-irradiated samples, while no movement of Ag was detected in the irradiated samples up to 1200 °C. Diffusion of Ag was detected after annealing at 1300 °C for the irradiated samples and no diffusion was detected in the un-irradiated samples up to 1400 °C. Therefore, SHI irradiation somehow enhanced diffusion of Ag.

Apply to be considered for a student award (Yes / No)?

yes

Level for award (Hons, MSc, PhD, N/A)?

PhD

Would you like to submit a short paper for the Conference Proceedings (Yes / No)?

yes

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