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Investigations of the Diffusion of Xenon Implanted in 6H-SiC

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Abstract content
 (Max 300 words)

The diffusion behaviour of implanted xenon in 6H-SiC has been investigated using Rutherford backscattering spectroscopy (RBS) and channelling techniques. Xenon (Xe+) ions with an energy of 360 KeV were implanted in SiC to a fluence of 2×1016 cm-2 at room temperature (23° C), 350° C and 600° C. Channelling revealed that the sample (6H-SiC) at room temperature created an amorphous layer, while at 350° C it did not cause amorphisation and the crystal structure was preserved. 5h sequential isochronal annealing was performed at temperatures ranging from 1000 to 1400° C. RBS on the annealed samples showed that no diffusion of the Xe occurred in the 350° C implanted samples. In the room temperature implanted samples there was evidence of diffusion of the xenon which only started after annealing at 1200° C. The diffusion was accompanied by a loss of xenon from the SiC surface. The difference in diffusion behaviour between the room temperature implanted and the 350° C samples suggest that the Xe diffusion in the room temperature implanted samples is due to the amorphisation of the 6H-SiC and subsequent recrystallization into a polycrystalline layer after annealing.

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T.T Hlatshwayo Thulani.hlatshwayo@up.ac.za

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Primary author: Ms THABETHE, Thabsile (University of pretoria (Tuks)) **Presenter:** Ms THABETHE, Thabsile (University of pretoria (Tuks))

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