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Electrical characterization of 5.4 MeV alpha-particle irradiated 4H-SiC with low doping density

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Abstract content
 (Max 300 words)

Nickel Schottky diodes were fabricated on 4H-SiC. The diodes had excellent rectification with twelve orders of magnitude between -2V and +2V. The ideality factor was obtained as 1.05 which signifies the dominance of the thermionic emission process in charge transport across the barrier. Deep Level Transient Spectroscopy (DLTS) revealed the presence of four deep level defects in the 30 – 350 K temperature range. The diodes were then irradiated with 5.4 MeV alpha particles up to a fluence of $2.6 \times 10^{10} \text{ cm}^{-2}$. Current Voltage (I-V) and Capacitance Voltage (C-V) measurements revealed degraded diode characteristics after irradiation. DLTS revealed the presence of two more energy levels with activation enthalpies of 0.42 eV and 0.76 eV below the conduction band. These levels were however only realized after annealing the irradiated sample at 200 °C and they annealed out at 400 °C.

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MSc

Main supervisor (name and email)
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F. D Auret, danie.auret@up.ac.za, University of Pretoria

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Primary author: Mr PARADZAH, Alexander (University of Pretoria)

Presenter: Mr PARADZAH, Alexander (University of Pretoria)

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