

Abstract Submitted
for the SES07 Meeting of
The American Physical Society

Two defect levels for the carbon vacancy carbon antisite pair in 4H-SiC.¹ GEOFFREY NGETICH, MARY ELLEN ZVANUT, University of Alabama at Birmingham — Due to its possible applications in high power devices, 4H-SiC is a material of keen interest to many researchers. The specific structure of point defects is often studied using electron paramagnetic resonance (EPR) while photo EPR allows for the understanding of their defect level. We are using EPR to look at SI5, a carbon-vacancy-carbon-antisite pair, $V_C C_{Si}$. The samples were prepared by halide chemical vapor deposition using gasses with different C/Si ratios. The process produces samples with resistivity activation energy, E_a , between 0.25 eV and 0.85 eV. The photo EPR was performed at 80 K using a quartz tungsten halogen lamp and a monochromator. Wavelengths were varied between 388 nm and 2400 nm. Results reveal that SI5 has photo-threshold energy of 0.75 eV for samples with $E_a = 0.25$ eV and 0.5 eV while samples with E_a of 0.85 eV had a threshold energy of 2.5 eV. In our model, the threshold energy represents the defect level where double negative to negative defect level, $V_C C_{Si}^{--/-}$, is 0.75 eV below the conduction band edge while negative to neutral, $V_C C_{Si}^{-/0}$, is 2.5 eV above the valence band edge.

¹This work was supported by NSF

Mary Ellen Zvanut
University of Alabama at Birmingham

Date submitted: 17 Aug 2007

Electronic form version 1.4