

Investigation of point and extended defects in electron irradiated silicon –dependence on the particle energy

Wednesday 11 June 2014 09:10 (20 minutes)

Silicon samples of n-type have been irradiated with electrons in the range 1.5 –27 MeV and different fluences. The Mott cross section as function of silicon recoils kinetic energy revealed that the threshold for the production of cluster related defects is 1.2 keV. For the characterization of the radiation induced defects the Thermally Stimulated Current (TSC) and Deep Level Transient Spectroscopy (DLTS) methods were used. From DLTS studies the impact of the V3 and E205a defects on the leakage current was confirmed, whereas from the TSC studies the contribution of the E(30K), H(40K), Ip and H defects to the N_{eff} is shown.

The annealing kinetics of the H defects was studied in detail by performing isothermal annealing for temperatures higher than 200 0C. From the Arrhenius plot of $\ln(1/\tau)$ versus $1000/T$ the activation energy for the annealing out process of the H defect, for DOFZ and STFZ samples, are calculated. The obtained results will be presented and discussed.

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Session Classification: Session 1 - Defect and Material Characterization