

Anneal dependent variations of lifetime and deep levels in neutron irradiated MCZ Si

Monday 10 November 2008 14:15 (20 minutes)

The photoconductivity spectra (PC) and lifetime measurement were used for control of transforms and competition of recombination and generation centres in neutron irradiated MCZ Si. In the as-irradiated material the recombination centres prevail and cause mono-exponential decay with nearly linear decrease of carrier lifetime from several microseconds to sub-nanoseconds with enhancement of fluence from 1012 to 3×10^{16} n/cm². Isochronal 24 hours anneals in the range of temperatures from 80 to 420 C induce variation of the density of different deep levels, which depends on irradiation fluence. Appearance of two-exponential decays and the changes of the effective lifetimes of the initial and asymptotic decays imply the complicated transformations of radiation defects under heat treatments. Qualitatively these transforms can be understood when existence and dominance of cluster defects is assumed. The PC spectra allowed to identify the deep levels playing role in free carrier capture and generation.

Author: Prof. VAITKUS, Juozas (Vilnius University)

Co-authors: Dr ZASINAS, Ernestas (Vilnius University); Dr GAUBAS, Eugenijus (Vilnius University); Prof. KAZUKAUSKAS, Vaidotas (Vilnius University); Mr KALENDRA, Vidmantas (Vilnius University)

Presenter: Prof. VAITKUS, Juozas (Vilnius University)

Session Classification: Defect and Material Characterization