THERMAL ANNEALING OF CLUSTERS AND POINT DEFECTS IN n-Si (Cz) IRRADIATED BY FAST-PILE NEUTRONS

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Thermal stability of clusters and point defects in n-Si grown by Czochralski technique (Cz) was studied after irradiation by thefluence ~ $(2 \div 4) \cdot 10^{13}$ $n^o \cdot cm^{-2}$ of fast-pile neutrons. The effective concentration of carriers after series of isochronal and isothermal annealings of irradiated n-type silicon with $n_0 = (0.4 \div 1.2) \cdot 10^{14}$ cm^{-3} before irradiation was described in the framework of the defect cluster corrected model. Stages of isochronal annealing process of defect clusters were determined with activation energies (E_a) and frequency factors (ν): $E_{a1} = 0.81$ eV, $\nu_1 = 5.4 \cdot 10^6$ s^{-1}; $E_{a2} = 0.4$ eV, $\nu_2 = 1$ s^{-1}; $E_{a3} = 1.3$ eV, $\nu_3 = 6 \cdot 10^4$ s^{-1}. Isothermal annealing at 353 K of defect clusters and interstitial atoms I_{Si} (E_c – 0,315 eV) in the conducting matrix of silicon was described with $E_a = 0.74$ eV and $\nu = (1 \div 3.5) \cdot 10^6$ c^{-1}.