

ON THE NATURE OF “NEGATIVE” ANNEALING
OF THE NONEQUILIBRIUM CHARGE CARRIER
LIFETIME IN IRRADIATED *n*-Si

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S u m m a r y

A variation of the recombination properties of pre-irradiated (by gamma quanta of ^{60}Co at 30 °C) Czochralski *n*-silicon during annealing at 20–350 °C as well as during the 1-MeV electron irradiation at the same temperature range of has been studied. The reduction of the lifetime τ of nonequilibrium charge carriers (NCCs) after annealing in the temperature range 200–300 °C (“negative” annealing) was found to be caused by the formation of V_2O complexes ($\text{V}_2 + \text{O} \rightarrow \text{V}_2\text{O}$), in particular, because the hole capture cross-section of those complexes is larger than that of V_2 defects. It has been found that the formation and annealing of V_2O complexes are characterized by the activation energies 1.35 and 1.6 eV, respectively, while the hole capture cross-section of those defects is $\sigma_p = 3 \times 10^{-13} \text{ cm}^{-2}$.