INFLUENCE OF A- AND E-CENTERS ON THE LIFETIME OF NONEQUILIBRIUM CHARGE CARRIERS IN γ-IRRADIATED n-Si

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S u m m a r y

The results of experimental comparison made for the recombination properties and the formation efficiencies (FEs) of A- and E-centers in γ-irradiated n-Si are reported. The conductivity of n-type was induced in Si by introducing there either chemical donors (phosphorus, n-Si$\langle$P$\rangle$) or thermal oxygen donors (n-Si$\langle$TD$\rangle$). The substitution of P by TDs, which are not sensitive to radiation, allows such n-Si to be obtained, in which irradiation does not give rise to the formation of E-centers. The A-centers have been shown to be dominant radiation-induced defects (RIDs) with almost identical FE values, as well as dominant recombination centers (RCs), in both n-Si forms with the doping levels of about $10^{14} \div 10^{16}$ cm^{-3}. The corresponding value of the hole-capture cross-section for A-centers was determined as $\sigma_A = (2.5 \pm 0.3) \times 10^{-13}$ cm^{-2}; and the corresponding value σ_E for E-centers was found not to exceed 1×10^{-14} cm^2.