ENERGY POSITION OF BISTABLE DEFECT $(C_iC_s)^O$ IN "B" CONFIGURATION IN A FORBIDDEN ZONE OF n-Si

A. P. Dolgolenko, P. G. Litovchenko, M. D. Varentsov, G. P. Gaidar

Float-zone and phosphorus-doped n-Si samples after irradiation by fast-pile neutrons and subsequent annealing at room temperature were investigated. The calculation of effective concentration of carriers after irradiation was carried out in the framework of Gossick`s model taking into account the recharges of defects both in conducting matrix of n-Si and in the space-charge region of defect clusters. The distribution function of electrons on the acceptor level of bistable defect $(C_iC_s)^o$ when the concentration of this defect is the function of the Fermi level in conducting matrix of n-Si is determined. The concentration of bistable interstitial-carbon-substitutional-carbon pair and its energy level at (E_c - 0,123 eV) in forbidden band of silicon were calculated. On the observable level of stable configuration C_iC_s (A^-)-defects at (E_c - 0,147 eV) the theoretical change of carriers concentration in the conduction band simulated by the recharges $(C_iC_s)^o$ was imposed. The concentration of these $(C_iC_s)^o$-defects has been changed in the process of their recharges. It is shown that in n-Si with high carbon and oxygen concentration after affiliating of oxygen atoms to bistable defect $(C_iC_s)^o$ in a forbidden band of n-Si the stable defects not only in "A" but also in "B" configurations are formed with energy levels at (E_c - 0,13 eV) and (E_c - 0,09 eV).