INFLUENCE OF NITROGEN IMPURITY ON PHOTOLUMINESCENCE OF SILICON NANOCLUSTERS IN SiO_2 MATRIX

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S u m m a r y

Photoluminescence (PL) spectra of SiO_x layers (x = 1.4–1.6) have been investigated. It is determined that the maximum intensity of PL is observed after the thermal annealing in SiO_x films with $x = 1.5$. The dependence of the photoluminescence spectra of $SiO_{1.5}$ layers on the concentration of nitrogen introduced by ion implantation and annealing in the N_2 ambient is investigated, and the depth profiles of the nitrogen distribution in SiO_x films are studied as well. The results obtained are explained within the framework of a model of the origin of radiative recombination centers on Si nanocrystal/matrix interfaces under the participation of nitrogen and the passivation of centers of non-radiative recombination.