RESEARCH
OF RECOMBINATION CHARACTERISTICS
OF Cz-Si iMPLANTED WITH IRON IONS

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S u m m a r y

A comparative study of the defect formation and changes in the lifetime of nonequilibrium minority charge carriers in silicon while gettering the iron impurity with the use of a combined getter "porous silicon layer + aluminum film" is carried out. It is shown that, while annealing specimens with no getter layer, iron silicide and defects of the vacancy type are formed in the implanted regions and, as a result, a considerable reduction in the lifetime of nonequilibrium minority charge carriers is observed. The influence of the getter layer on the defect formation and the redistribution of iron atoms implanted into silicon are studied in the case of high iron concentrations in a vicinity of the surface. The presence of a getter layer is shown to reduce the efficiency of the silicide formation in the implanted region and to increase the concentration of interstitial defects in silicon. A model of the gettering process is proposed, which makes allowance for the gettering-induced reduction of the iron atom concentration in the implanted region and a decrease of the vacancy defect concentration, as well as the simultaneous increase of the concentration of interstitial-type defects associated with the formation of complexes of iron and boron atoms. These complexes are recombination-active and do not allow the lifetime of charge carriers to be restored to the initial value.