HEAT TREATMENT EFFECT ON RADIATION STABILITY OF THE SCHOTTKY BARRIER ON THE BASE OF n-Ge

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ABSTRACT

The analyses of the method for increase of radiation stability of semiconductor devices are given in the present state. For this purpose in n-Ge the thermal defects have preliminarily been created and their interaction with radiation defects in the irradiation process has been investigated by photocapacity and photoconductivity methods.

It has been found that when interacting with radiation defects in the irradiation process, preliminarily created thermal defects in n-Ge form more stable defects which lead to increase of radiation stability of diodes.

The set of the obtained experimental data indicates that at heat treatment of Germanium at temperatures of T ≥ 500 °C the defects with intrinsic structural disturbances of the crystal lattice itself are formed. These defects interacting with radiation defects during irradiation form more stable defects leading to increase in radiation stability of the material. The fact that the insertion velocity of radiation defects in thermally treated samples is less than in thermally untreated samples indicates that thermal defects are responsible for mobile radiation defects. The results obtained from this study are agree with the handled data.

Key Words: Stability, Semiconductor, Effect, Schottky

1.INTRODUCTION

Recently, much attention is given to the investigation of the ionising radiation effect on the self diffusion in solids. This is attributed to the fact that the radiation-stimulated processes in solids determine the character of the change of the properties of solids at their interaction with radiation. The investigation of these regularities in solids allows to obtain information on mechanisms of the formation and annealing of radiation defects and is also of great practical importance due to the problem of increase in radiation stability of semiconductor devices. (Jafarov, 1990)