

INCOHERENT LIGHT-INDUCED DIFFUSION OF ALUMINUM INTO SILICON

*A.B. Gerasimov, A.P. Bibilashvili, R.E. Kazarov,
I.D. Lomidze, Z.G. Bokhochadze, E.N. Maziashvili*

Tbilisi State University, Faculty of Physics
(13, Chavchavadze Ave., Tbilisi 0179, Georgia;
e-mail: ngmk@geomail.ge)

S u m m a r y

We have investigated the diffusion of aluminum from a thin metal stimulated by the halogen lamp light. Samples were irradiated on the aluminum-free surface by pulses with duration within 1-30 s, which caused the heating of a sample from 120 to 1200 °C. The impurity concentration profile was determined by the repeated etching of the thin substrate diffusion layer and by measuring the surface resistivity by the four-probe method and the capacitance-voltage ($C-V$) method using a mercury (Hg) probe. It is shown that, at a given intensity, the impurity concentration in the near-surface region increases and the penetration depth reduces with increase in the pulse duration. The observed dependences are ascribed to the generation of additional drift diffusion flows due to the non-uniform depth distribution of free carriers created by light and temperature which weaken chemical bonds.