

Thermal diffusivity measurement for p-Si and Ag/p-Si by photoacoustic technique

ABSTRACT

Thermal diffusivity (TD) of p-Si and Ag/p-Si samples were measured by photoacoustic technique using open photoacoustic cell (OPC). The samples were annealed by heating them at 960, 1050, 1200, and 1300 °C for 3 h in air. The thermal diffusivity of Ag-coated samples was obtained by fitting the photoacoustic experimental data to the thermally thick equation for Rosencwaig and Gersho (RG) theory. For the single layer samples, the thermal diffusivity can be obtained by fitting as well as by obtaining the critical frequency f_c . In this study, the thermal diffusivity of the p-Si samples increased with increasing the annealing temperature. The thermal diffusivity of the Ag/p-Si samples, after reaching the maximum value of about 2.73 cm²/s at a temperature of 1200 °C, decreased due to the silver complete melt in the surface of the silicon.