

The study of thermally stimulated current effect on silicon base semiconductor

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ABSTRACT

This study investigates the optical and electrical property of semiconductor at different temperature. We use Close-Cycle system to control temperature and observe thermally stimulated current of semiconductor. We use the measurement of thermally stimulated current (TSC) method to determine the energy trap of silicon semiconductor. According to the TSC measurement of semiconductor, the sample will produce photoinduced carriers due to be exposed by light at low temperature. Then these carriers are captured by defects. Because of these carriers will be released by defect at different temperature, we can observe a maximum current in this time. This impurity center energy is about 70 meV which is agreement with the previous result. We also obtain the electron transport characteristic from the Hall effect at different temperature. This sample is P-type according to the result of our study. The activation energy is about 66 meV in the fitting of our TSC measurement at the feature temperature. We can determine the dopants in the semiconductor by the simple method of TSC measurement.

Keywords : thermally stimulated current、Hall effect、activation energy

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