

KINETICS OF PHOTOCONDUCTIVITY  
IN MACROPOROUS SILICON STRUCTURES

*L.A. Karachevtseva, V.F. Onyshchenko, A.V. Sachenko*

V. Lashkarev Institute for Semiconductor Physics,  
Nat. Acad. of Sci. of Ukraine  
(45, Nauky Ave., Kyiv 03680, Ukraine;  
e-mail: [lakar@isp.kiev.ua](mailto:lakar@isp.kiev.ua))

S u m m a r y

Relaxation of photoconductivity in macroporous *n*-silicon structures has been studied. The corresponding effective relaxation time was found to be governed by the barrier mechanism, and the relaxation itself to follow the logarithmic law. The relaxation time of photoconductivity in macroporous silicon turned out by an order of magnitude larger than that in single-crystalline silicon. The temperature dependence of the relaxation time of photoconductivity was found to be governed by the thermoemission mechanism of the current transport in the space-charge region at temperatures higher than 150 K, by the recombination mechanism in the temperature range 150–100 K, and by the processes of tunnel current transport at temperatures below 100 K. The probability of tunneling, the lifetime of photocarriers, and the cross-section of their capture are established to be independent of the temperature.