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Raman spectra observation of silver nanoparticles in porous silicon fabricated by ion implantation

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Abstract

© 2015, Pleiades Publishing, Ltd. Porous silicon layers fabricated by the low-energy high-dose Ag⁺-ion implantation of crystalline silicon with doses from 7.5×10^{16} to 1.5×10^{17} ion/cm² are studied by Raman spectroscopy. Pores with sizes from ~100–180 nm formed on irradiated silicon surface are controlled by scanning electron microscopy. Synthesized silver nanoparticles are observed in the structure of porous silicon. The sizes of pores and nanoparticles are increased with an increase in implantation dose. Acoustic vibrations generated by laser irradiation in silver nanoparticles of various sizes are registered by low-temperature Raman spectra of composite material.

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