

Fabrication and simulation of silver
nanostructures on different types of
porous silicon for surface enhanced
Raman spectroscopy

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Abstract: In this paper, we propose a systematic approach to controllably fabricate silver nanoparticles, dendrites and nanovoids on porous template based on silicon and two-step wet process. Geometry of metallic structures was managed by variation of dopant type of silicon, regimes of template formation and deposition of silver. General models of each structure were developed and studied for distribution and strength of electric field arising in them under 473, 633 and 785 nm lasers. Simulation results revealed reasons of variable activity of fabricated structures in surface enhanced Raman spectroscopy, which allowed to define optimal conditions of analysis of target molecules.

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