

Nanoplasmonics and surface enhanced spectroscopy

Self-organized silver nanostructures in porous SiO₂ matrix

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Self-organized silver nanostructures were grown in porous Si/SiO₂ matrix fabricated by ion track technology. The different self-organized silver nanostructures with various shapes were realized controllably by applying wet-chemical electroless deposition. These silver nanostructures provide a significantly enhanced Raman signal. The well-organized silver nanostructures can act as efficient surfaces for surface enhanced Raman spectroscopy as well as (bio)-sensor applications.

The investigation was carried out with a financial support from the scientific-technical program “Nanotechnology-SG”, DFG Project No. SI1893/2-1 and European FP7 Project “PIRSES-GA-2011-295273-NANEL”.

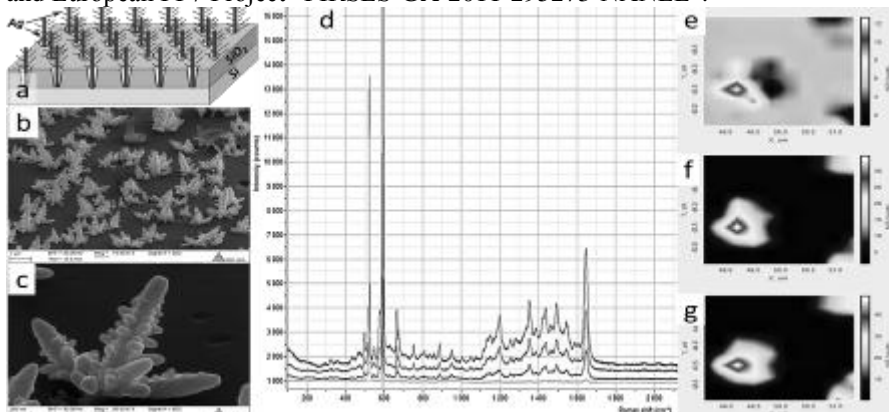


Figure - Silver nanostructures (dendrites) in the pores of SiO₂: schematic representation (a); scanning electron microscopy image (b, c). Enhancement of the Raman signal (laser with a wavelength of 532 nm) of 10⁻⁵ M Nile blue (C₂₀H₂₀ClN₃O) aqueous solution (d); distribution of Raman signal at 520 cm⁻¹ (e), 593 cm⁻¹ (f) and 1643 cm⁻¹ (g) (scanning surface 20×20 μm² in 0.2 μm increments)