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## **Self-organized gold, silver and copper nanostructures for SERS**

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Surface-enhanced Raman scattering (SERS) spectroscopy is widely recognized as a high-sensitive method for applications in analytical chemistry, ecology, biomedicine and food industry. The noble metal surfaces with nanoscale roughness, so-called SERS-active substrates necessary to use for optical signal enhancement. For SERS-substrates creation, it is very interesting and challenging to understand the mechanism of silver, copper and gold self-organization in limited volumes (pores) for formation of plasmonic nanostructures arrays with complex, but adjustable shapes. Swift heavy ion track technology has been applied to the pre-patterning of porous surfaces. Wet-chemical methods of the deposition of noble metals and their combinations in the pores have been applied for self-organization of nanoscaled metal structures. The characterization of plasmonic structures were carried out by surface analytic methods like SEM, EDX, EBSD, TEM, etc., which are combined with theoretical modeling of growth processes and plasmonic properties supporting the optimization process of the surface.

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