

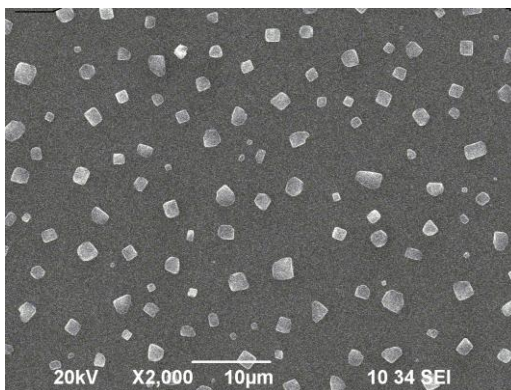
# Nanocomposites and nanomaterials

## Mesoscopic design of inorganic self-assembled nanostructures of spatially ordered in the thin mesoporous films.

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For the specific property under consideration, mesoscopic materials can describe in terms of continuous, homogeneous media on scales less than that of the nanostructure. Self-assembly of inorganic clusters in the pore channel due to their size effect gives Self-assembly procedures are proving to be useful in this aspect Templates such as surfactants used to form nanoparticles various architectures.



SEM image of the stabilized Ag/SiO<sub>2</sub> films

We are reporting the controlled formation of uniform sized Au and Ag nanostructures generated from the self-assembly of biochemical based synthesis. It established that silver and gold nanostructure that are mesoscopic distributed in mesochannels of thin films, are characterized by high thermal stability and photoactivity. Stabilization of nanostructures in the matrix is accompanied by a shift of maximum surface plasmon resonance bands due to the interaction of metal with elements of the matrix. These nanocomposite showed attractive electronic and photocatalytic properties, in particular, in the reactions of hydrogen evolution from aqueous-alcoholic solutions, coatings, self-cleaning rest. Adjustable density of silver nanostructures is promising to create for them a high gain Raman signal and application of analytical techniques in materials obtained SERS and SEIRA.