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## Nonlinear and Chiral Plasmonic Glasses

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Hybrid materials and in particular transparent monolithic materials (xerogels, aerogels) are intensively investigated for optical applications (sensors, filters, imaging, photocatalysis...).[1] The preparation of 3D composite structures incorporating either molecular entities and/or functional nanoparticles represents a challenge on the way to optical devices. The preparation of monolithic transparent silica-based material using the sol-gel process and incorporation of functional nanostructures (plasmonic, luminescent) will be presented here.

The sol-gel process allows the design of transparent hybrid monolithic xerogels or aerogels. Plasmonic or luminescent nanostructures can be introduced during the process. Plasmonic nanostructures are functionalized in order to allow their homogeneous incorporation in the transparent hybrid silica matrices.[2] Co-dispersion of the metallic structures with dyes can be achieved.[3-5] The role of the concentration, shape and size of the metal nanoparticles on the nonlinear optical response is crucial, both in the visible and in the NIR. Similarly, chiral nanoparticles can be introduced to provide chiral properties to the final glass.

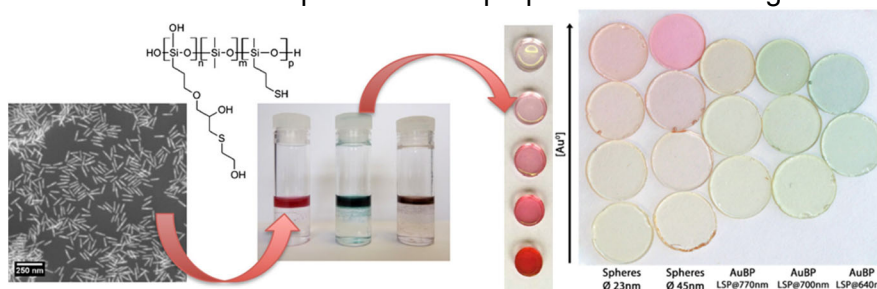


Figure 1. Surface modification of the metal nanoparticles and transfer inside a silica glass.

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