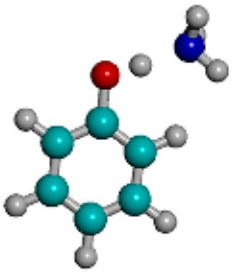

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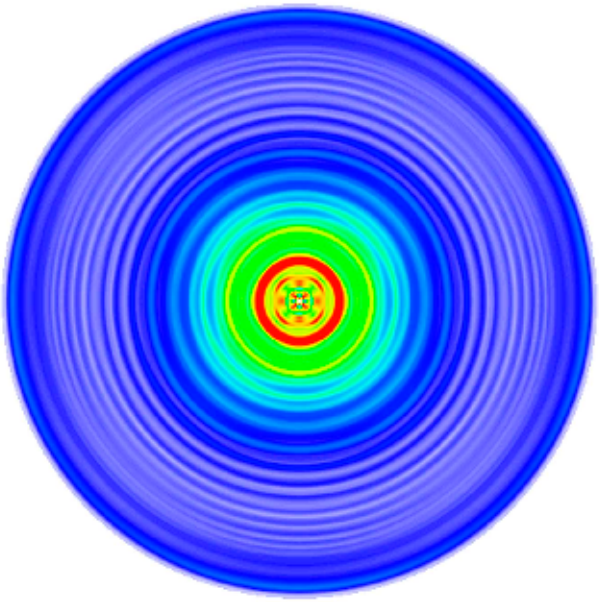

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Fluorescence characterization of a drug delivery system based on a nanostructured porous silicon matrix loaded with the anti-tumoral drug emodin adsorbed on silver nanoparticles

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Porous silicon (PS) (fig.1) is an interesting biocompatible and biodegradable material, able to carry biomolecules conjugated to drugs for achieving site-specific delivery acting as a "magic bullet". These properties make nanostructured-PS microparticles suitable candidates for developing novel drug delivery systems. However, in most cases the drug does not enter inside the pores, being then necessary to functionalize the silicon surface.

To overcome this limitation we have tried a different approach, loading the PS matrix with the drug emodin adsorbed on a silver colloid. This emodin-silver set has been previously spectroscopically characterized in our group [1, 2]. The use of noble metal nanoparticles presents a double advantage. First, drug molecules can be adsorbed on their surfaces and, consequently, transported together; secondly, and very important, the excitation of Localized Surface Plasmon Resonances (LSPRs) on metal nanoparticles makes them excellent sensors using SERS and SEF spectroscopy.

The setting up and optimization of these new systems pass through the characterization of their physicochemical behaviour. We have accomplished it using fluorescence and Raman spectroscopy.

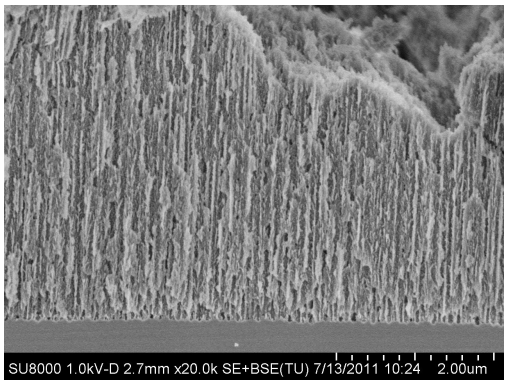

Figure 1: SEM images of porous silicon matrix showing the size of the pores (62.0 nm).

[1] P. Sevilla, F. García-Blanco, J.V. García-Ramos and S. Sánchez-Cortes, Phys. Chem. Chem. Phys., 11, 8342, (2009).

[2] R. De-Llanos, S. Sánchez-Cortés, C. Domingo, J. V. García-Ramos and P. Sevilla, J. Phys. Chem. C, 115, 12419 (2011).