**Nanostructured substrates for highly sensitive detection of degradation products of modern paintings**

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Keywords: *Surface Enhanced Raman Spectroscopy, modern paintings, nanostructured materials*

Surface Enhanced Raman Spectroscopy (SERS) is a vibrational spectroscopy technique which allows the detection of very small amounts of analytes through the amplification of the electromagnetic field generated by plasmon excitation on the surface of metallic nanostructured materials. Such amplification depends on three main parameters such as the plasmonic structure used as optical enhancer, the intrinsic Raman properties of the analyte and the affinity of the analyte for the plasmonic structure. In this presentation, we propose the development of a SERS substrate conceptually and technologically new, with high performances and easily scalable. That is with the final aim to expand the versatility of SERS and allow its use as routinely analytical technique for the detection of organic and inorganic species of interest for the cultural heritage conservation. In particular we show preliminary results on the direct application of elastomeric, therefore flexible, nanostructured substrates before plasmonic material coating as support which may be directly applied onto paintings (or other surface of interest) to extract/remove a small amount of the degradation products of synthetic binders. After accurate removal form the surface of interest the substrate is coated with the opportune metal to assure the SERS effect, and is finally submitted to a laboratory analysis in a Raman spectrometer.

*The financial support by the European Commission – Horizon 2020 project “NANOmaterials for the REStoration of works of ART” is kindly acknowledged.*