Formulation of nanocomposites of silver nanowires and graphene for the fabrication of SERS substrates for GMOs detection

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This work is aimed at finding optimal formulations of silver nanowires (AgNWs) and graphene derivatives, including proper assembly and engineering in 2D substrates, to define a standard, simple and reproducible procedure for surface-enhanced Raman spectroscopy (SERS) for detection of GMOs in the environment. A hybrid SERS substrate was produced by deposition of AgNWs onto a laminated paper of graphene nanoplatlets (G-Paper). Deposition was performed using a common aerosol device upon optimization of concentration and deposition time to maximize the SERS activity. The as-fabricated substrate was tested under a microRaman spectrometer for the detection of haemoglobin, as model protein. Then it was further optimized using a spots template coating, which allowed to increase the sensitivity of the technique confining the protein within the spot area. Finally the substrate was tested for direct detection of GMOs upon simple deposition of a few-microliter drop of solution of RolC protein (Cytokinin-beta-glucosidase) on the top of the spot followed by evaporation and Raman inspection.

References:

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Acknowledgments:

C.A., M.B., C.D’A., M.de A., F.B and P.M. acknowledge support from Tuscany Region in the framework of the POR FESR 2014-2020 – action line 1.1.5.a3 - FAR-FAS 2014 - SENSOGM project.