

Comparative SERS and UV-Visible measurements for low concentration detection of biocidal groups

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Raman spectroscopy is widely applied for analytical studies since it combines high selectivity and ability to analyse materials with no prior sample preparation. Surface Enhanced Raman spectroscopy (SERS) might be a more valuable detection method because it is a very sensitive technique manifested as an enhancement by many orders of magnitude of the intensity of Raman radiation by molecules in the immediate vicinity to nano-rough metal surfaces and nano-structured metal systems such as nanocolloid clusters of noble metals. A novel surface enhanced Raman scattering excitation/collection configuration with a new oscillating cell combined with right angle scattering collection geometry has been recently introduced [1]. The present work constitutes an attempt to introduce SERS in the monitoring of release processes of biocidal analytes and to compare the detection limits obtained by this method with a most traditional and common technique used in quantitative analysis controlled release as UV-Vis absorption. These analytes are novel polymeric materials with enhanced and controllable antifouling properties, which are promising for potential applications in the field of “clean” surfaces, either for sanitary purposes or as antifouling paints.

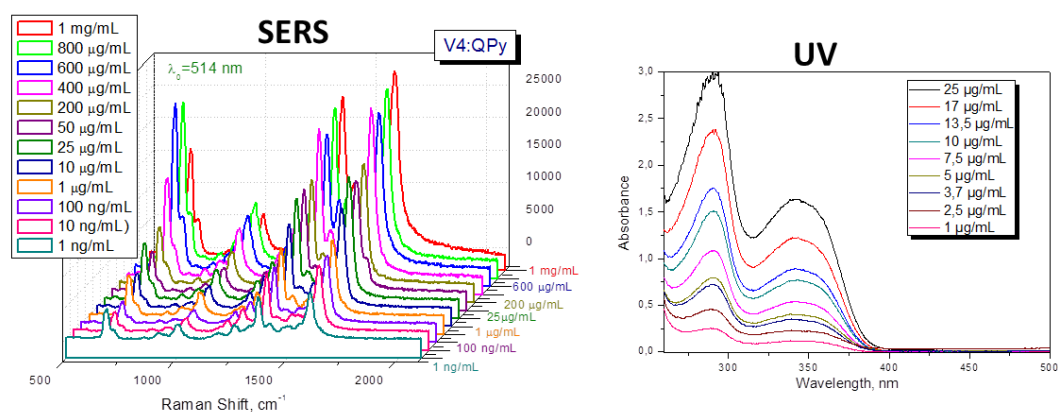


Figure 1: Comparison of the low concentration (detection limits) for the same biocidal analyte using UV-Vis spectroscopy (1 µg/mL) and SERS (1 ng/mL)

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References

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