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Synthesis of silver nanoparticles used as SERS Raman substrate , analysis of various organic samples and first tests on micro plastics

The following work aims to develop the synthesis of silver nanoparticles used as a substrate for Micro Raman SERS analysis of various organic samples antimicrobial) and first tests on micro plastics. There are many advantages of the Raman technique, however the limit is linked to the inelastic scattering process, its cross section is approximately 10 orders of magnitude smaller than the absorption cross section.

To address this problem, SERS spectroscopy (Surface Enhanced Raman Spectroscopy) was subsequently introduced which allows the sensitivity to be increased by several orders of magnitude and consequently obtain a more intense signal.

The amplification of the Raman signal is possible thanks to the interaction of the incident electromagnetic radiation with a metallic substrate (usually gold or silver) near the sample. In particular, we propose the development of a simple and easily reproducible synthesis of spherical silver nanoparticles which act as a metal substrate and allow the intensity of the Raman signal to be significantly increased and the concentrations of molecules of the order of nanomolar to be detected. and lower the fluorescence sometimes induced by the sample.