BOOK OF ABSTRACTS

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MAGNETO-PLASMONIC NANOCOMPOSITES AS SELECTIVE AND SENSITIVE SENSORS FOR WATER REMEDIATION

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Water monitoring is an important instrument for preventing pollution and, consequently, protecting both public health and the environment. Surface-enhanced Raman scattering (SERS), a highly sensitive analytical technique capable of detecting trace concentrations of analytes, is a promising tool for pollutant detection [1, 2]. Nanocomposites consisting of plasmonic and magnetic nanoparticles (NPs) can serve as SERS substrate owing to the optical properties of plasmonic NPs while also facilitating target extraction from the water using a simple magnetic field [2, 3]. We present magnetic NPs decorated with Au NPs via chitosan, synthesized by an environmentally friendly method. To validate SERS detection, highly charged porphyrins were chosen as model molecules. Subsequently, phenylboronic acid (PBA) was attached to the nanocomposites surface to improve selectivity, followed by SERS detection of selected pollutants containing diols (e.g. amikacin). PBA has a unique ability to reversibly bind diol-containing molecules depending on the solution pH [4]. Therefore, such functionalized magneto-plasmonic nanocomposites can be repeatedly used for the purposes of SERS detection and selective removal of pollutants from water.

References

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