

Detection of Glyphosate in Water with Photonic-Tailored Silver Nanoparticles

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Abstract

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Abstract:

This work describes an approach towards the detection of glyphosate levels in liquid compatible with standards for drinking water. Prismatic nanostructures were produced from spherical silver nanoparticles by photoinduced shape conversion, leading to an enhanced interaction between the nanoparticles and the analyte, inferred by both ultraviolet-visible and surface enhanced Raman spectroscopy. The role of the silver nanoparticles' shape and charge in the interaction with glyphosate was investigated. SERS spectra revealed fingerprint bands that provide an unambiguous identification of this herbicide. The obtained limit of detection was 0.11 mg/L, which is almost 8.2 times smaller than the health-based reference value.

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