

U-Shaped Fiber Sensor Based on Surface Plasmon Resonance of Gold Nanoparticles for Measuring Glyphosate in Water

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Abstract

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Keywords

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Abstract:

This work describes the development of a plasmonic plastic optical fiber sensor for measuring glyphosate in water, probed within the 0.2 μ M - 4.0 mM concentration range. By combining an adequate synthesis of functionalized metallic Au nanoparticles with an optimized 37 % thin film coverage of the fiber surface, the sensing presents a 17 nM limit of detection for glyphosate. This result complies with most international standards for water potability. The sensor showed specificity against the interferents aminomethylphosphonic acid-AMPA and glufosinate-ammonium. It is possible to accomplish the sensing with two different approaches: while the U-shaped sensor is still immersed in the water or after being removed from the sample under test and left to dry. The innovative latter option can be highly beneficial for field application.

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