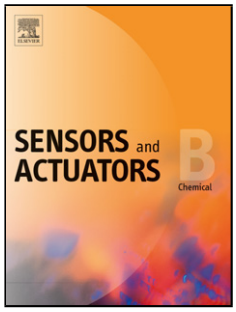

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Surface-imprinted fluorescence microspheres as Ultrasensitive Sensor for Rapid and Effective Detection of Tetracycline in Real Biological Samples

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Highlights

- The highly controllable nanoshell at surface-imprinted fluorescent sensors were synthesized successfully.
- The MIPs-AF@SiO_2 thin surface-imprinted fluorescent sensors integrated the advantages of molecular imprinting and fluorescent probe for rapid and effective detection tetracycline (TC), and LOD is 4.26 nM.
- The fluorescence sensors MIPs-AF@SiO_2 could efficiently detect TC in real biological samples, including tetracycline hydrochloride injection, human serum and swine urine.

Abstract

Molecularly imprinted fluorescence sensors have shown great promise in environmental or biological monitoring and due to its high stability, selectivity and sensitivity. In this study, a fluorescence surface-imprinted sensor (SiO_2-AF@MIPs) towards tetracycline (TC) was successfully prepared to address the shortcomings in current molecularly imprinted fluorescent sensor, such as slow response, limited detection and deteriorated performance in real complex samples. Benefited from the thin surface-imprinting layer, the SiO_2-AF@MIPs sensors showed higher sensitivity (LOD low to 4.26 nM), rapid detection rate, reusable performance and excellent selectivity over several target competitors. Furthermore, the fluorescence sensor could efficiently detect TC in real biological samples, including tetracycline hydrochloride injection, human serum and swine urine. These results clearly demonstrated the