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Fabrication of magnetic $\text{Fe}_3\text{O}_4@\text{nSiO}_2@\text{mSiO}_2\text{-NH}_2$ core-shell mesoporous nanocomposite and its application for highly efficient ultrasound assisted dispersive μSPE -spectrofluorimetric detection of ofloxacin in urine and plasma samples

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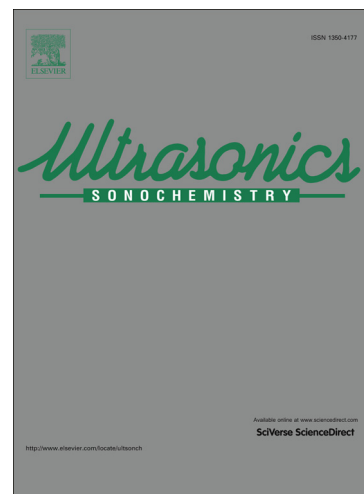
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Fabrication of magnetic $\text{Fe}_3\text{O}_4@\text{nSiO}_2@\text{mSiO}_2\text{-NH}_2$ core-shell mesoporous nanocomposite and its application for highly efficient ultrasound assisted dispersive μSPE -spectrofluorimetric detection of ofloxacin in urine and plasma samples

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In this research, a sensitive, simple and rapid ultrasound assisted dispersive micro solid-phase extraction (USAD- μSPE) was developed using a synthesized core-shell magnetic mesoporous nanocomposite ($\text{Fe}_3\text{O}_4@\text{nSiO}_2@\text{mSiO}_2\text{-NH}_2$) as an efficient adsorbent for the preconcentration and spectrofluorometric determination of ofloxacin (OFL) in biological samples. The synthesized adsorbent were characterized using FT-IR spectroscopy, transmission electron microscopy (TEM), vibrating sample magnetometer (VSM), energy dispersive X-ray (EDX) spectroscopy, thermogravimetric analysis (TGA) and Brunauer-Emmett-Teller (BET) analysis. The application of this magnetic nanocomposite as a sensitive solid phase for removal, preconcentration and spectrofluorometric quantification of trace amount of OFL was developed. Influence of various variables including pH, sorbent dosage, desorption solvent properties and sonication time on present method response was studied and optimized. The results showed that using the proposed method OFL can be determined in the linear concentration range of $1.0\text{--}500.0\text{ }\mu\text{g L}^{-1}$ with a limit of detection as low as $0.21\text{ }\mu\text{g L}^{-1}$ and relative standard deviation less than 2.5 (%). The results of human urine and blood plasma analysis showed that the method is a good adsorbent for biological sample analysis purposes.

Keywords: Ofloxacin, magnetic nanoparticles, ultrasound assisted, preconcentration, fluorescence detection

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