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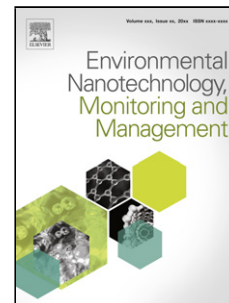
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**Magnetic activated carbon@ iron oxide@manganese oxide composite as an adsorbent for preconcentration of microcystin –LR in surface water, tap water, water and wastewater**

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**Highlights**

- Activated carbon@ iron oxide@manganese oxide composite prepared as a DMSPE sorbent.
- The as-prepared magnetic sorbent revealed excellent affinity for MC-LR.
- The developed DSMPE/UV procedure was rapid, simple, sensitive, and accurate.
- The adsorbent was stable and reusable.

**Abstract**

A simple, rapid and effective method based on dispersive solid phase microextraction (DSPME) and UV-Vis spectrophotometer was developed for the preconcentration and determination of microcystin-LR (MC-LR) in environmental matrices. The activated carbon@ iron oxide@manganese oxide composite was used as solid phase material. The composite was characterized by scanning electron microscope/energy dispersive x-ray spectroscopy (SEM/EDS), transmission electron microscope (TEM), X-ray powder diffraction (XRD), nitrogen adsorption/desorption and Fourier transform infrared (FTIR). The factors affecting the DSPME were optimized using multivariate strategy. Under optimized condition, the LOD, LOQ, repeatability (n=10), reproducibility (n=5) and preconcentration factor were  $0.5 \mu\text{g L}^{-1}$ ,  $1.7 \mu\text{g L}^{-1}$ , 3.1, 4.5% and 50, respectively. The percentage recovery of MC-LR in spiked water samples was found to be 98.5%. The

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