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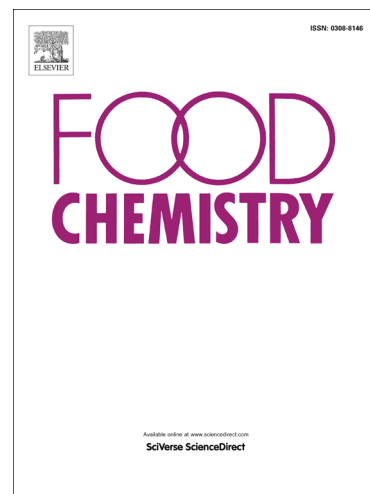
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## Core-shell Fe<sub>3</sub>O<sub>4</sub> polydopamine nanoparticles as sorbent for magnetic dispersive solid-phase extraction of copper from food samples

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### Abstract

In the present study, core-shell Fe<sub>3</sub>O<sub>4</sub> polydopamine nanoparticles were synthesized and used for the first time as an adsorbent for the vortex assisted magnetic dispersive solid phase extraction of copper from food samples. After elution, copper in the solutions was determined by FAAS. The adsorbent was characterized using X-ray diffraction, scanning electron microscopy, energy dispersive X-ray spectroscopy, Fourier transform infrared spectroscopy, Brunauer-Emmett-Teller surface area, and zeta potential measurements. Various parameters affecting the magnetic dispersive solid-phase extraction were evaluated. The optimum pH and magnetic adsorbent amount were found to be 5 and 40 mg, respectively. Elution was made by 3 mL of 2 mol L<sup>-1</sup> HNO<sub>3</sub>. The major advantage of the method is the fast equilibration during adsorption without the need for vortexing or shaking. The preconcentration factor and detection limit of the method were found to be 150 and 0.22 mg L<sup>-1</sup>, respectively. The precision (as RSD%) and adsorption capacity of the method were 3.7% and 28 mg g<sup>-1</sup>, respectively. The method was successfully verified by analyzing four certified reference materials (SPSWW1 Batch 114, TMDA 53.3 Lake water, BCR-482 Lichen and 1573a Tomato Leaves) and by addition/recovery tests of copper standard solution in organic baby food, muesli, macaroni, honey, and milk samples.

*Keywords:* Magnetic dispersive solid-phase extraction; Copper; Fe<sub>3</sub>O<sub>4</sub>@PDA; Core-shell; Food samples; FAAS

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