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Versatile magnetic carbon nanotubes for sampling and pre concentration of pesticides in environmental water

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ABSTRACT

This article describes a simple, efficient, and versatile magnetic carbon nanotubes (MCNT) method for sampling and pre-concentration of pesticides in environmental water samples. The multi-walled magnetic carbon nanotubes were obtained by chemical deposition vapor (CVD) process. The MCNTs structures are formed of hydrophobic and hydrophilic fractions that provide great dispersion at any water matrix allowing simultaneously a high efficiency of pesticides sorption. Following the extraction, analytes were desorbed with minor amounts of solvent and analyzed by gas chromatography coupled mass spectrometry (GC/MS). The parameters amount of MCNTs used to extraction, desorption time, and desorption temperature were optimized. The method showed good linearity with determination coefficients between 0.9040 and 0.9733. The limits of detection and quantification were ranged between 0.51 and 2.29 μg L^{-1} and between 1.19 and 5.35 μg L^{-1} respectively. The recovery ranged from 79.9 to 111.6 %. The method was applied to the determination of fifteen multiclass pesticides in real samples of environmental water collected in Minas Gerais, Brazil.