Title:

Vortex Assisted Magnetic Solid Phase Extraction for Determination of Triazine Herbicides by High Performance Liquid Chromatography using Surfactant Modified Activated Charcoal Coated with Magnetic Nanoparticle

Name:
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Abstract:
Statement of the Problem: In the present study, activated charcoal modified with non-ionic silicone surfactant of OFX 0309 charcoal coated with magnetic nanoparticles forming AC-OFX MNPs were successfully synthesized as a new generation material for magnetic solid phase extraction (MSPE). The synthesized materials were characterized using a few techniques such as FT-IR, VSM, XRD, TGA, BET and SEM analysis. The new approach of non-ionic silicone surfactant OFX 0309 was chosen due to its properties that may provide good performance toward organic compounds. Methodology: AC-OFX MNPs material was being applied as magnetic adsorbents for pre-concentration and separation of triazine species. Several parameters influencing the extraction efficiency such the concentration of surfactant used, amount of sorbent, sample solution pH, extraction time, ionic strength, desorption conditions and sample volume were optimized to study the performance of MPSE method using newly synthesized AC-OFX MNPs material. Findings: Under the optimal conditions, the proposed method was evaluated and applied to the analysis of triazine compounds in environmental samples using high performance liquid chromatography-diode array detector (HPLC-DAD). The validation method showed good linearity (0.3 – 500 µg L^{-1}) with coefficient of determination (R^2) in the range of 0.992 – 0.998. The limit of detection (LOD) and quantification (LOQ) of the developed method (AC-OFX MNPs-MSPE) were in the range 0.003 – 0.004 µg L^{-1} and 0.010 – 0.013 µg L^{-1} respectively. Conclusion & Significance: The newly synthesized AC-OFX MNPs material owned with good performance toward organic compounds, reusability and fast extraction of triazine compounds under the MSPE procedure in environmental water samples.

(Up to 250 words)

Biography (Up to 100 words)

I, a senior lecturer who has been attached to Cluster of Integrative Medicine, Advanced Medical and Dental Institute (AMDI), Universiti Sains Malaysia (USM) since 2015. I earned my Bachelor in Analytical and Environmental Chemistry from Universiti Malaysia Terengganu, Malaysia. I obtained my Master of Science (Analytical Chemistry and Instrumental Analysis) from Universiti Malaya, Malaysia in 2011 and Doctor of Philosophy (Ph.D) in Analytical Chemistry from the same university (Universiti Malaya) in 2015. I am actively doing research on surfactant, ionic liquids in separation sciences and new material development for analytical applications. I have published interesting research articles in reputable journals which highlights my research field.

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