Application of ZnS/S/S-RGO three-component~~s~~ nanocomposites in dispersive solid-phase microextraction coupled with ion mobility spectrometry for ultra-trace analysis of bendiocarb, butachlor, and diazinon~~,~~ in food and environmental samples

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ABSTRACT:

A fast, effective, and sensitive dispersive solid-phase microextraction method coupled with ion mobility spectrometry for the simultaneous determination of bendiocarb, butachlor, and diazinon was developed using Zinc sulfide/Sulfur/Sulfur-doped reduced graphene oxide (ZnS/S/S-RGO) nanocomposites. ZnS/S/S-RGO three-component~~s~~ nanocomposites were synthesized through a single-step solvothermal procedure, and their properties were characterized by FT-IR, FESEM, and EDX. The influence of different parameters was optimized on the efficiency of the extraction ~~such as kind,~~including the type and the volume of desorption solvent, pH, ~~kind~~ type and the volume of buffer, the amount of absorbent, sorption, ~~and~~ plus desorption time~~, were optimized~~. Under the optimal conditions, linear ranges were achieved 0.8-110, 1-110, and 0.5-100 ng mL^{-1} with the detection limits of 0.320, 0.40, and 0.27 ng mL^{-1} for bendiocarb, butachlor, and diazinon, respectively. The presented method was successfully employed for the ultra-trace determination of bendiocarb, butachlor, and diazinon in water, rice, wheat, and soil samples with acceptable recovery values ~~in~~ within the range of 96.4-103.7 %.

Keywords:

Bendiocarb; Butachlor. Diazinon; Dispersive solid phase microextraction; Ion mobility spectrometry (IMS);