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SOLID PHASE EXTRACTION OF DIAZINON USING SDBS MODIFIED Mg/Al LAYERED DOUBLE HYDROXIDE

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Abstract

The preparation and application of a layered double hydroxide containing Mg and Al modified with the surfactant sodium dodecylbenzene sulfonate (Mg/Al-SDBS LDH), as the adsorbent for the solid phase extraction (SPE) of diazinon from water samples, followed by its determination by HPLC is described. The SPE experiments were conducted under optimum conditions determined by Response Surface Methodology (RSM). The best extraction efficiency of diazinon (about 95%), from 20 mL sample containing 100 µg/L of diazinon, was achieved by using 65 mg of the adsorbent while the solution pH and the sodium sulfate concentration were adjusted to 6 and 20 w/v%, respectively. The optimized contact time equals to 26 min. The desorption step was performed by using 2 mL of acetonitrile in contact with the loaded LDH for 30 min. HPLC analysis was realized using a mixture of water/acetonitrile (60/40 v/v%) as the mobile phase. The calibration curves were linear in the range 0.5-500 (LOD 0.12), 5-400 (LOD 0.35), 3-450 (LOD 0.29) and 3-500 (LOD 0.18) µg/L of diazinon in deionized water, agricultural land water, tap water, and mineral water samples, respectively. The reproducibility and repeatability of the method were evaluated to be respectively, 4.10% and 3.10%, for the deionized water samples (n=5) spiked with 10 µg/L of diazinon. The evaluated preconcentration factors were 20-24.5 in different matrices. The useability of the presented method was evaluated by its application for the analysis of diazinon in real samples.

Keywords: diazinon, modified layered double hydroxide, preconcentration, response surface methodology, sodium dodecyl benzene sulfonate

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