

عنوان مقاله:

Determination of herbicides in environmental samples using pH-sensitive magnetic microgel as a smart sorbent

محل انتشار:

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خلاصه مقاله:

Introducing new sorbents is an interesting and debatable issue in the field sample preparation. In this study, for the first time, a pH-sensitive magnetic microgel, Fe₃O₄-SiO₂-poly(4-vinylpyridine), was introduced as a smart sorbent. The operating mechanism of this sorbent is based on changing the pH value of the sample and consequently that the structure of this pH-sensitive microgel is changed. So that, in pH = 6 the microgel was ready to accept and load the analytes (partial swelling), and when the pH was raised to 8.0, the microgel was closed and analytes were trapped inside the sorbent (deswelling). In pH = 2 the microgel was opened and the analytes were released from the microgel (swelling). As the adsorption and desorption mechanism was based on changing the pH and only aqueous medium was used as effluent solvent, this method was introduced as a green extraction method. The use of this microgel resulted in excellent figures of merit. The limits of quantitation and detection for herbicides were obtained within the range of 10-30 and 3-10 ng mL⁻¹, respectively. Finally, the proposed method was successfully applied to determine the concentration of phenoxy acid herbicides as hazardous materials in environmental samples.

کلمات کلیدی:

Capillary electrophoresis, Environmental samples, Phenoxy acid herbicides, pH-sensitive microgel, Smart sorbent

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