

عنوان مقاله:

Amylodextrin hydrogel as a green sorbent for pipette tip micro solid phase extraction of triazole fungicides from environmental water samples

محل انتشار:

دهمین سمینار ملی شیمی و محیط زیست ایران (سال: 1400)

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خلاصه مقاله:

In the present work, a hydrogel was synthesized by combination of hydrophilic acrylic polymers and biodegradable amylopectin and characterized by Fourier transform-infrared (FT-IR) spectroscopy, Brunauer-Emmett-Teller (BET) surface area, elemental CHN analysis, field emission scanning electron microscopy (FE-SEM) and used as a green sorbent for extraction and preconcentration of triazole fungicides. Triazole compounds have been globally used for controlling fungal diseases such as rusts, powdery mildews and many leaf-spotting fungi. These compounds have also negative effects on the environment and human health. This research has investigated the determination of triazole fungicides (penconazole, hexaconazole, tebuconazole) in environmental water samples (river water and agricultural wastewater) using pipette tip micro solid phase extraction combined with corona discharge ion mobility spectrometry as a rapid and sensitive detection technique. The effects of important variables on the extraction efficiency were optimized by response surface model (RSM). Under optimum experimental conditions (amount of sorbent: 6 mg, pH of sample solution: 8.0, flow rate of sample solution: 2.0 mL/min, adsorption time: 16.5 min, desorption solvent volume: 1.1 mL, flow rate of desorption solvent: 0.5 mL/min, desorption time: 11.7 min) the technique provided good linearity ($r^2 > 0.995$) over a concentration range of 1.0-1000 ng/mL and repeatability (RSD < 1.7%, $n = 5$), low limits of detection (0.18-0.20 ng/mL), good preconcentration factors (18.6-19) and high recoveries (93-95%). Finally, the proposed method was applied for quantification of triazoles in environmental water samples.

کلمات کلیدی:

Amylodextrin hydrogel; Environmental water samples; Ion mobility spectrometry; Pipette tip micro solid phase extraction; Triazole fungicides

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