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ACCEPTED MANUSCRIPT

Synthesis of Fe_3O_4@CuS@Ni_2P-CNTs magnetic nanocomposite for sonochemical-assisted pre-concentration of trace Allura Red from aqueous samples prior to HPLC-UV detection: CCD-RSM design

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Abstract

A simple procedure based on ultrasound-assisted (UA) dispersive micro solid phase extraction (D-μ-SPE) was applied for adsorption of trace amount Allura Red (AR) in fruit juice and water samples. After loading process by UA-D-μ-SPE, the concentrated AR was eluted and monitored using high-performance liquid chromatography-ultraviolet -visible detector (HPLC-UV). The best operational conditions were obtained as follows: pH = 3.0, 8 mg of the sorbent, sonication time of 4.5 min and 0.16 mL THF as elution solvent. Under the optimum operational conditions, the present method was acceptable for AR quantification in the range of 1.0-5000 ng mL^{-1}. The repeatability based on RSD with the amount of 1.67–3.18%, low LOD (0.198 ng mL^{-1}) and LOQ (0.659 ng mL^{-1}) were obtained. The UA-D-μ-SPE-HPLC-UV method was successfully applied for trace quantification of AR from water and commercial fruit juice samples supplied from local supermarkets, and acceptable relative recoveries over the range of 97.7-105.4 % with RSDs ≤ 5.50 % were obtained.

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