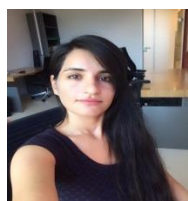


Simultaneous determination of adulterants in dietary food supplements using multivariate data analysis after preconcentration with novel nano sorbents and chromatographic measurement

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Abstract

An analytical method for the simultaneous and reliable detection and quantitative determination of three key adulterants in dietary food supplements was developed. High-pressure liquid chromatography (HPLC) assisted by multivariate curve resolution-alternating least square (MCR-ALS) analysis was used to detect adulterants in real samples after separation and preconcentration using novel mesoporous carbon nanoparticles. Solid phase extraction (SPE) optimization was accomplished by central composite design (CCD). In order to obtain the best results, the MCR-ALS model was compared with the parallel factor analysis 2 (PARAFAC2) model and validated by estimation of linearity, detection limits, and recovery. The detection limits and linear dynamics were calculated as 1.5, 4.27, 4.77 μgml^{-1} and 1 - 50, 5 - 20, 5 - 20 μgml^{-1} for caffeine, ephedrine, and fluoxetine, respectively. Mean recovery for determination of caffeine, ephedrine, and fluoxetine using the developed method was reported 101.75, 91.7, and 92.36, respectively. The results showed that to avoid negative health outcomes associated with the inconsiderate consumption of adulterated food supplements, releasing such products should be carefully regulated.

Keywords: HPLC-DAD, Multivariate calibration, Multivariate curve resolution, Dietary food supplements, Adulterants.

Biography

Ensie Hosseini is a PhD student in analytical chemistry at Tehran University. After she finished her first project she traveled to the Netherlands to work on a new project under supervision of Prof. Age Smilde. Two papers out of her projects are ready to be published soon.



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