عنوان مقاله:

Spectrophotometric Multicomponent Analysis of Ternary and Quaternary Drug Mixtures in Human Urine Samples by Analyzing First-order Data

محل انتشار:

تعداد صفحات اصل مقاله: 13

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خلاصه مقاله:

A new method was developed for the spectral resolution by further determination of three- and four-component mixtures of drugs in urine samples through the complementary application of multivariate curve resolution-alternating least squares with correlation constraint. In the current study, a simple method was proposed to construct a calibration set for the mixture of drugs in the presence of all possible interferents in the human urine samples collected, in duplicate, from volunteers. First, urine samples were collected without any dosage of drugs. Then, urine samples containing a specific brand of drugs were collected. The collected urine samples without any dosage of drugs were spiked with a different concentration of analytes to construct a calibration set; therefore, the proposed method might be successfully used in the presence of matrix effects and unknown calibrated interferences in human urine using first-order data. In this method, a smaller number of calibration samples were used as compared to first-order multivariate calibration methods. Despite intense spectral overlapping and the presence of interferents in the test samples, the results indicated good analytical performance towards the analytes. By calibrating all present components in the unknown samples and imposing the known values in calibration samples during iterations as a correlation constraint, accurate concentrations of the analytes in the unknown set could be predicted. The maximum and minimum band boundaries of feasible solutions corresponding to the species profiles were estimated. The proposed method was used to determine ternary and quaternary mixtures of drugs in urine samples.

کلمات کلیدی:

MCR-ALS, Ternary mixture of drugs, Quaternary mixture of drugs, First order data, Human urine

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