

Chemometrics-assisted spectrophotometry for simultaneous determination of sodium benzoate and citric acid in beverage products

Title	Chemometrics-assisted spectrophotometry for simultaneous determination of sodium benzoate and citric acid in beverage products
Author Order	3 of 4
Accreditation	2
Abstract	<p>The development and validation of chemometrics-assisted spectrophotometry have been successfully performed for determination of sodium benzoate and citric acid that have overlapping of ultra violet absorption spectra. The study aimed to develop, validate, and apply spectrophotometric method with chemometrics approach for determination of both compounds in beverage products simultaneously. The analytical method was performed by making a calibration model using 16 training sets and 10 test sets of mixed solution followed by absorbance measurement at wavelength of 190 nm up to 400 nm. In addition, the absorbance data was processed by multivariate calibration models of principal component regression (PCR) and partial least square-1 (PLS-1) and validated internally and externally to obtain optimum model. Validation of analytical methods was done by evaluating some parameters such as linearity and ranges, accuracy, precision, detection limits and quantification limits. The results showed that the optimum wavelength was 235 nm to 250 nm for sodium benzoate and 220 nm to 240 nm for citric acid with the selected optimum principal components (PCs) value were 6 (PCR) and 4 (PLS-1) for sodium benzoate and PCs 2 (PCR and PLS-1) for citric acid. The parameters of the analytical method validation developed were suitable and the analytical methods could be applied for the determination of the sodium benzoate and citric acid contents simultaneously in the beverage products.</p>
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