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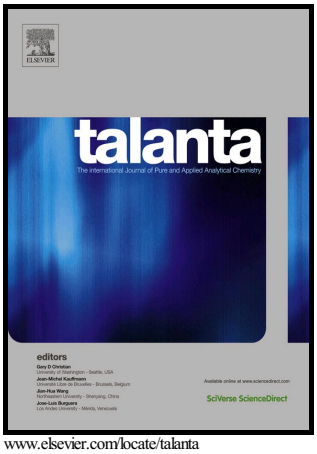

www.elsevier.com/locate/talanta

PII: S0039-9140(18)30334-5
DOI: https://doi.org/10.1016/j.talanta.2018.03.096
Reference: TAL18530

To appear in: *Talanta*

Received date: 31 December 2017
Revised date: 25 March 2018
Accepted date: 29 March 2018

Cite this article as: Marcin Wieczorek, Marek Dębosz, Paweł Świt, Aneta Woźniakiewicz and Paweł Kościelniak, Application of gradient ratio flow-injection technique to implementation of the Chemical H-point Standard Addition Method, *Talanta,* https://doi.org/10.1016/j.talanta.2018.03.096

Application of gradient ratio flow-injection technique to implementation of the Chemical H-point Standard Addition Method

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Abstract

A new gradient ratio approach to Chemical H-point Standard Addition Method (C-HPSAM) was developed in flow injection analysis with spectrophotometric detection. C-HPSAM is based on an idea to use SAM for calibration in several different chemical conditions in order to correct unspecific (additive) interferences in samples with unknown matrix. The approach proposed in this paper employs the gradient ratio flow-injection technique to generate a continuous change of chemical conditions. By doing so a set of two-point SAM calibration curves with different slopes are possible of registering that are intersected in a common point indicating the values of both unspecific interferences and analyte concentration in a sample. The applicability of the approach was verified on the examples of spectrophotometric determinations of ascorbic acid and paracetamol. Ascorbic acid was determined in soft drinks and juices basing on reduction of Fe(III) to Fe(II) and reaction of the latter ion with o-phenantroline to form the ferroin complex absorbing at 512 nm. Paracetamol determined in pharmaceuticals was nitrificated in reaction with sodium nitrite in acidic medium and then the formed derivative species was converted into a more stable compound in reaction with sodium hydroxide, for which absorbance was recorded at 430 nm. All analytical results were obtained within the confidence interval of the values obtained by capillary electrophoresis and the relative errors were below 6%. It was proved that the developed method is readily applicable to analysis of real samples of complex unknown matrices. As it is additionally effective, low-cost and green, it can be considered as a helpful analytical tool.

Keywords: analytical calibration, H-point standard addition method, gradient technique, flow technique, ascorbic acid, paracetamol