Novel two wavelength spectrophotometric methods for simultaneous determination of binary mixtures with severely overlapping spectra

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Abstract

This work presents the application of different spectrophotometric techniques based on two wavelengths for the determination of severely overlapped spectral components in a binary mixture without prior separation. Four novel spectrophotometric methods were developed namely: induced dual wavelength method (IDW), dual wavelength resolution technique (DWRT), advanced amplitude modulation method (AAM) and induced amplitude modulation method (IAM). The results of the novel methods were compared to that of three well-established methods which were: dual wavelength method (DW), Vierordt's method (VD) and bivariate method (BV). The developed methods were applied for the analysis of the binary mixture of hydrocortisone acetate (HCA) and fusidic acid (FSA) formulated as topical cream accompanied by the determination of methyl paraben and propyl paraben present as preservatives. The specificity of the novel methods was investigated by analyzing laboratory prepared mixtures and the combined dosage form. The methods were validated as per ICH guidelines where accuracy, repeatability, inter-day precision and robustness were found to be within the acceptable limits. The results obtained from the proposed methods were statistically compared with official ones where no significant difference was observed. No difference was observed between the obtained results when compared to the reported HPLC method, which proved that the developed methods could be alternative to HPLC techniques in quality control laboratories. Copyright © 2014 Elsevier B.V. All rights reserved.

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