A comparative study of different aspects of manipulating ratio spectra applied for ternary mixtures: Derivative spectrophotometry versus wavelet transform

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Abstract

This work represents a comparative study of different aspects of manipulating ratio spectra, which are: double divisor ratio spectra derivative (DR-DD), area under curve of derivative ratio (DR-AUC) and its novel approach, namely area under the curve correction method (AUCCM) applied for overlapped spectra; successive derivative of ratio spectra (SDR) and continuous wavelet transform (CWT) methods. The proposed methods represent different aspects of manipulating ratio spectra of the ternary mixture of Ofloxacin (OFX), Prednisolone acetate (PA) and Tetryzoline HCl (TZH) combined in eye drops in the presence of benzalkonium chloride as a preservative. The proposed methods were checked using laboratory-prepared mixtures and were successfully applied for the analysis of pharmaceutical formulation containing the cited drugs. The proposed methods were validated according to the ICH guidelines. A comparative study was conducted between those methods regarding simplicity, limitation and sensitivity. The obtained results were statistically compared with those obtained from the reported HPLC method, showing no significant difference with respect to accuracy and precision

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