

Different applications of isosbestic points, normalized spectra and dual wavelength as powerful tools for resolution of multicomponent mixtures with severely overlapping spectra.

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Abstract

Analysis of complex mixture containing three or more components represented a challenge for analysts. New smart spectrophotometric methods have been recently evolved with no limitation. A study of different novel and smart spectrophotometric techniques for resolution of severely overlapping spectra were presented in this work utilizing isosbestic points present in different absorption spectra, normalized spectra as a divisor and dual wavelengths. A quaternary mixture of drotaverine (DRO), caffeine (CAF), paracetamol (PCT) and para-aminophenol (PAP) was taken as an example for application of the proposed techniques without any separation steps. The adopted techniques adopted of successive and progressive steps manipulating zero /or ratio /or derivative spectra. The proposed techniques includes eight novel and simple methods namely direct spectrophotometry after applying derivative transformation (DT) via multiplying by a decoding spectrum, spectrum subtraction (SS), advanced absorbance subtraction (AAS), advanced amplitude modulation (AAM), simultaneous derivative ratio (SIDR), advanced ratio difference (ARD), induced ratio difference (IRD) and finally double divisor/ratio difference-dual wavelength (DD-RD-DW) methods.

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