

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 (S1DD), advanced ratio difference (ARD), induced ratio difference (IRD) and finally double divisor–ratio difference–dual wavelength (DD-RD-DW) methods.

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