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Application of wavelet and Fuorier transforms as powerful alternatives for derivative spectrophotometry in analysis of binary mixtures: A comparative study

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Abstract

Two signal processing methods, namely, Continuous Wavelet Transform (CWT) and the second was Discrete Fourier Transform (DFT) were introduced as alternatives to the classical Derivative Spectrophotometry (DS) in analysis of binary mixtures. To show the advantages of these methods, a comparative study was performed on a binary mixture of Naltrexone (NTX) and Bupropion (BUP). The methods were compared by analyzing laboratory prepared mixtures of the two drugs. By comparing performance of the three methods, it was proved that CWT and DFT methods are more efficient and advantageous in analysis of mixtures with overlapped spectra than DS. The three signal processing methods were adopted for the quantification of NTX and BUP in pure and tablet forms. The adopted methods were validated according to the ICH guideline where accuracy, precision and specificity were found to be within appropriate limits.

Keywords

Bupropion; Continuous Wavelet Transform; Derivative Spectrophotometry; Discrete Fourier Transform; Naltrexone; Signal Processing