Spectral analysis of overlapped absorption bands of binary mixture-an application on combination of Pseudoephedrine Sulfate and Loratadine mixture

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Abstract

Background
Simple, specific, accurate, and precise spectrophotometric methods are progressed and validated for concurrent analysis of pseudoephedrine sulphate (PSE) and loratadine (LOR) in their combined dosage form depending on spectral analysis procedures. In this binary mixture, pseudoephedrine (PSE) could be determined by using its resolved spectrum of zero-order absorption at 256.8 ɲo "chʋgt"uwdʋtcevkqp"qh" the spectrum of LOR, and also it could be determined in existence of the spectrum of LOR by different methods including absorption correction method (AC) at 256.8 nm and 280 ɲo."fwcn"ycxgnɲpiʋj"ogʋjqf"*FY+"cv"254 ɲo"cpf"273 ɲo."kpfwegf" dual-wavelength method (IDW) at 230 ɲo"cpf"263 ɲo."cpf"tcvkq"fkhhgtgpeg"ogʋjqf" (RD) at 256.8 ɲo"cpf"270 ɲo0"Nqtcvcfkpg"*NQT+"kp"vjg"dkpct{"okzvwtg"eqwnf"dg" determined either by direct analysis at 280 ɲo"ykʋjqwv"cp{"eqpvtkdwʋkqp"htqo"vjg" spectrum of PSE or through its recovered spectrum of zero-order absorption via constant multiplication method (CM) using plateau region (277ó326 ɲo+0"Cnuq." concurrent determination for PSE and LOR in their overlapped binary mixture could be achieved by applying induced amplitude modulation (IAM) method.

Results
Specificity of the proposed spectrophotometric methods was examined by the analysis of prepared mixtures in laboratory and was applied successfully for pharmaceutical dosage form analysis which has the cited drugs without additive contribution. The proposed spectrophotometric methods were also validated as per the guidelines of ICH. Statistical comparison was performed between the obtained results with those from the official methods of the cited drugs, using one-way ANOVA, F test, and Studentøs t test, and the results exhibit insignificant difference concerning precision and accuracy.

Conclusions
The previously proposed spectrophotometric methods could be easily used accurately and precisely for simultaneous determination of the studied binary mixture with simple manipulation procedures.