Novel spectrophotometric determination of chloramphenicol and dexamethasone in the presence of non labeled interfering substances using univariate methods and multivariate regression model updating

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Abstract

Smart and novel spectrophotometric and chemometric methods have been developed and validated for the simultaneous determination of a binary mixture of chloramphenicol (CPL) and dexamethasone sodium phosphate (DSP) in presence of interfering substances without prior separation. The first method depends upon derivative subtraction coupled with constant multiplication. The second one is ratio difference method at optimum wavelengths which were selected after applying derivative transformation method via multiplying by a decoding spectrum in order to cancel the contribution of non labeled interfering substances. The third method relies on partial least squares with regression model updating. They are so simple that they do not require any preliminary separation steps. Accuracy, precision and linearity ranges of these methods were determined. Moreover, specificity was assessed by analyzing synthetic mixtures of both drugs. The proposed methods were successfully applied for analysis of both drugs in their pharmaceutical formulation. The obtained results have been statistically compared to that of an official spectrophotometric method to give a conclusion that there is no significant difference between the proposed methods and the official ones with respect to accuracy and precision.

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