Novel stability-indicating chemometric-assisted spectrophotometric methods for the determination of chlordiazepoxide and clidinium bromide in the presence of clidinium bromide's alkali-induced degradation product

Hayam Lotfy ,Yasmin M.Fawzy, Christine K.Nessim

Abstract

Two simple and accurate chemometric-assisted spectrophotometric models were developed and validated for the simultaneous determination of chlordiazepoxide (CDZ) and clidinium bromide (CDB) in the presence of an alkali-induced degradation product of CDB in their pure and pharmaceutical formulation. Resolution was accomplished by using two multivariate calibration models, including principal component regression (PCR) and partial least-squares (PLS), applied to the UV spectra of the mixtures. Great improvement in the predictive abilities of these multivariate calibrations was observed. A calibration set was constructed and the best model used to predict the concentrations of the studied drugs. CDZ and CDB were analyzed with mean accuracies of 99.84 ± 1.41 and 99.81 ± 0.89% for CDZ and 99.56 ± 1.43 and 99.44 ± 1.41% for CDB using PLS and PCR models, respectively. The proposed models were validated and applied for the analysis of a commercial formulation and laboratory-prepared mixtures. The developed models were statistically compared with those of the official and reported methods with no significant differences observed. The models can be used for the routine analysis of both drugs in QC laboratories.

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