

Quantitative determination of prednisone in tablets by infrared attenuated total reflection and Raman spectroscopy.

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Streszczenie

The quantification of prednisone in tablets was performed using partial least squares (PLS) models based on FTIR-attenuated total reflection (ATR) and FT-Raman spectra. To compare the predictive ability of these models, the relative standard error of prediction (RSEP) values were calculated. In the case of prednisone determination from the FT-Raman data, RSEP values of 3.1 and 3.2% for the calibration and validation data sets were obtained. For FTIR-ATR models, which were constructed using five spectra for each sample, these errors amounted to 2.6 and 2.9%, respectively. Four commercial products containing 1, 5, 10, and 20 mg prednisone/tablet were quantified. Concentrations derived from the elaborated models correlated strongly with the results of reference analyses and with the declared values (in parentheses). The analyses gave recoveries of 100.0-101.6% (100.1-103.0%) and 98.1-103.2% (100.4-102.9%) for FTIR-ATR and FT-Raman data, respectively. A successful quantification of prednisolone in tablets containing 5 mg active ingredient/tablet was also performed using the PLS model, which was based on FTIR-ATR spectra, with a recovery of 99.8 (98.8%). Both reported spectroscopic techniques can be used as fast and convenient alternatives to the standard pharmacopeial methods of prednisone and prednisolone quantification in solid dosage forms. However, in the case of FTIR-ATR spectroscopy, it is necessary to repeat measurements several times to obtain sufficiently low quantification errors.

Adres publiczny

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