

Determination of Total Phenolic Content in Olive Oil Samples by UV-visible Spectrometry and Multivariate Calibration

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The viability of determining the total phenolic content in olive oil samples by chemometric analysis of UV-vis spectral data was studied. As a result, a novel spectrophotometric method that does not require prior analyte separation is proposed. The method uses partial least squares (PLS) regression modeling in conjunction with UV-vis absorption spectral data obtained on oil samples dissolved in hexane. The resulting PLS model was developed by correlating the total phenolic content determined by Folin-Ciocalteu assay with the spectral data of oil solution between 210 and 340 nm. The predictive ability of the model was good as indicated by the root mean square error of prediction (RMSEP) and relative error (6.7 mg kg⁻¹ and 6.1%, respectively) obtained for analysis of the validation set of samples. The principal figures of merit, namely limit of detection (7.3 mg kg⁻¹), analytical sensitivity (1.0 mg kg⁻¹) and precision (<10% RSD) were considered adequate for routine analysis. The