

Quantification of Salicylates and Flavonoids in Poplar Bark and Leaves Based on IR, NIR, and Raman spectra

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Streszczenie

Poplar bark and leaves can be an attractive source of salicylates and other biologically active compounds used in medicine. However, the biochemical variability of poplar material requires a standardization prior to processing. The official analytical protocols used in the pharmaceutical industry rely on the extraction of active compounds, which makes their determination long and costly. An analysis of plant materials in their native state can be performed using vibrational spectroscopy. This paper presents for the first time a comparison of diffuse reflectance in the near- and mid-infrared regions, attenuated total reflection, and Raman spectroscopy used for the simultaneous determination of salicylates and flavonoids in poplar bark and leaves. Based on 185 spectra of various poplar species and hybrid powdered samples, partial least squares regression models, characterized by the relative standard errors of prediction in the 4.5–9.9% range for both calibration and validation sets, were developed. These models allow for fast and precise quantification of the studied active compounds in poplar bark and leaves without any chemical sample treatment

Słowa kluczowe

poplar, salicylates, flavonoids, multivariate analysis, vibrational spectroscopy

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