

Abstract in English

This master thesis is focused on verifying the possibility of optimizing FTIR spectrometric analysis of terpenic resins using derivatized (fluorinated) samples using XtalFluor-E in combination with triethylamine trihydrofluoride as an agent.

Terpenic resins have very similar FTIR spectra, so for their better differentiation, they need to be derivatized to minimize the influence of overlapping spectral bands in FTIR spectra. This work aimed to create a methodology for derivatization of samples of natural polymers for the National Technical Museum in Prague, where the work was performed.

Samples of terpenic resins were measured non-fluorinated by the ATR crystal method and by transmission, after fluorination, only the ATR crystal method was used. Different fluorination conditions, different times (2, 4, 6, 24 and 96 hours), the effect of sample rinsing (diethyl ether, ethylene tetrachloride) and the effect of matrix on the sample (KBr pellet) were tested.

Fluorination has shown to be effective. Four hours of fluorination and the need to rinse the sample with diethyl ether were chosen as the optimal fluorination conditions. After testing the resins themselves, fluorinated samples of violin varnishes and samples of historical varnishes from harp and piano were analyzed. Their spectra before and after fluorination were discussed and confronted with the experience of the staff of the National Technical Museum in Prague.

In the future, this methodology in the laboratory of the National Technical Museum in Prague will increase the reliability in the analysis of historical and degraded samples of varnishes based on terpenic resins.

Keywords: derivatization, infrared spectroscopy, natural polymers, terpenic resins, XtalFluor-E