



ZADAVATEL: Mgr. Tímea Varga

ODBĚR – LOKALITA: Egyptian coffin

Č. AKCE / Č. VZORKU: 23/18/67-69

POPIS VZORKŮ A MÍSTA ODBĚRU: 3 samples of colour layers (sample 3, 10 and 14)

POŽADOVANÉ STANOVENÍ: material analysis

PROTOKOL

Procedure

Analysis of organic materials - varnishes and binders. Samples - cross-sections embedded into the epoxy resin were analysed by FTIR spectroscopy on FTIR spectrometer Nicolet iN10 microscope technique ATR / Ge crystal. The spectra were compared with spectra of standards from different databases.

The obtained spectra are not spectra of pure compounds, but spectra of mixtures. In some cases, the analysis cannot specify exactly the substance, but only the chemical group of substances, which belongs to (for example waxes, polysaccharides, ...).

Sample 3E

Fig. 1: Sample 3 blue layer

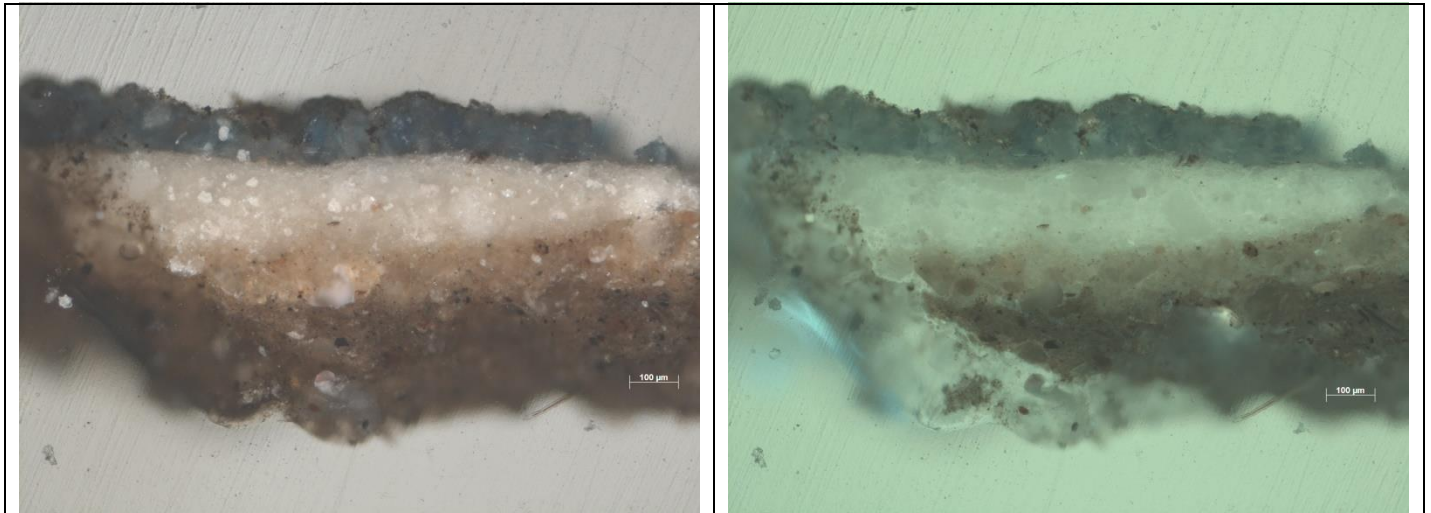


Fig. 2: Sample 3E - FTIR spectrum of (dark) ground layer with spectra of standards. Ground layer consists of chalk, oil and probably some impurities (aluminosilicates).

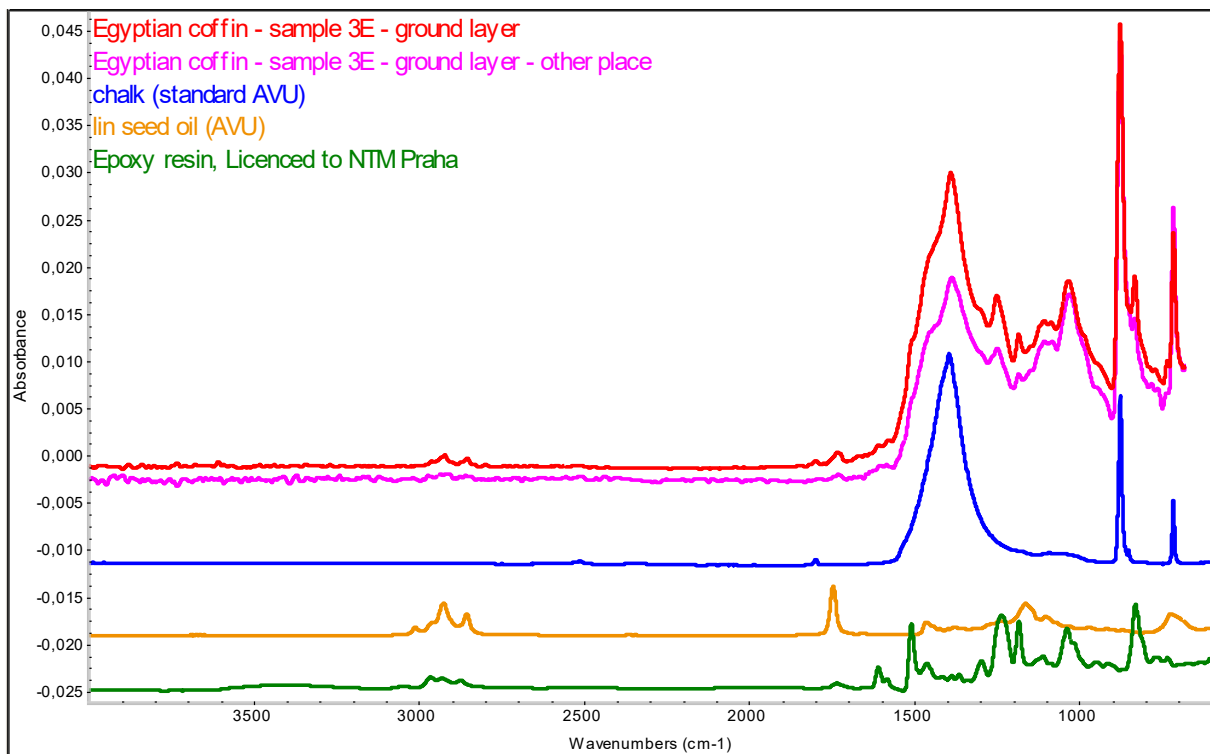


Fig. 3: Sample 3E - FTIR spectra of colour layer achieved from the different places.

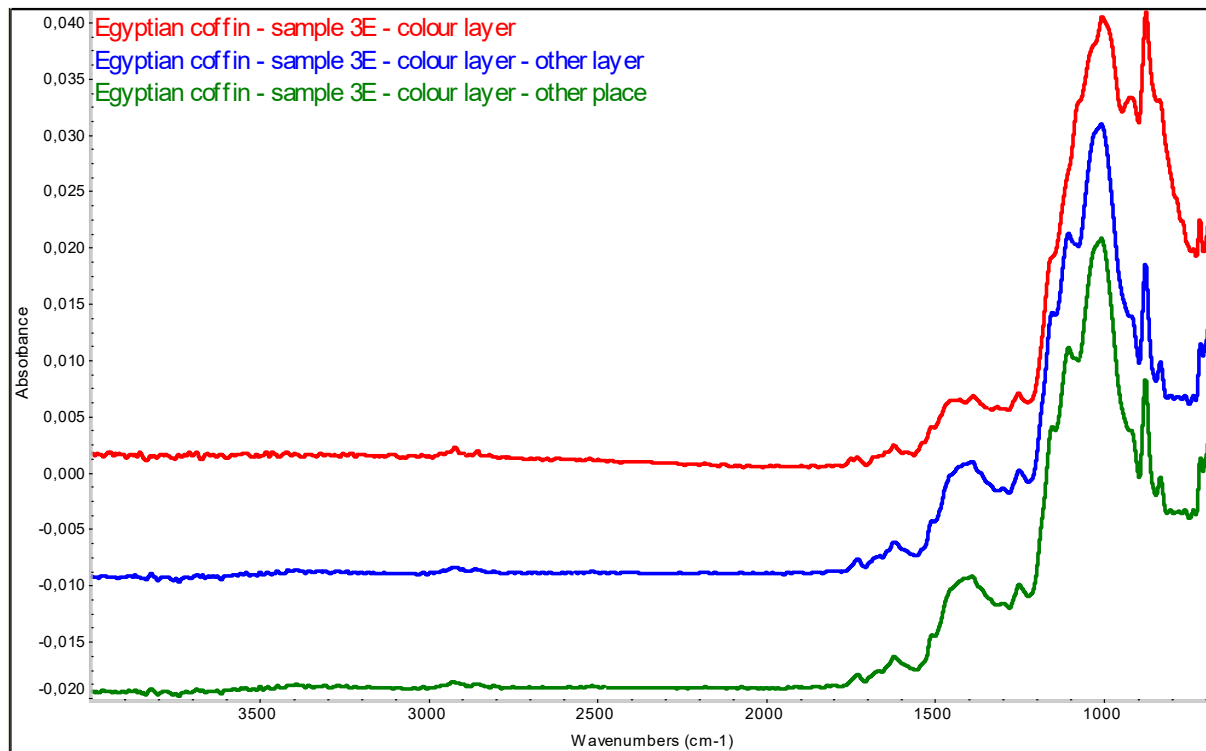
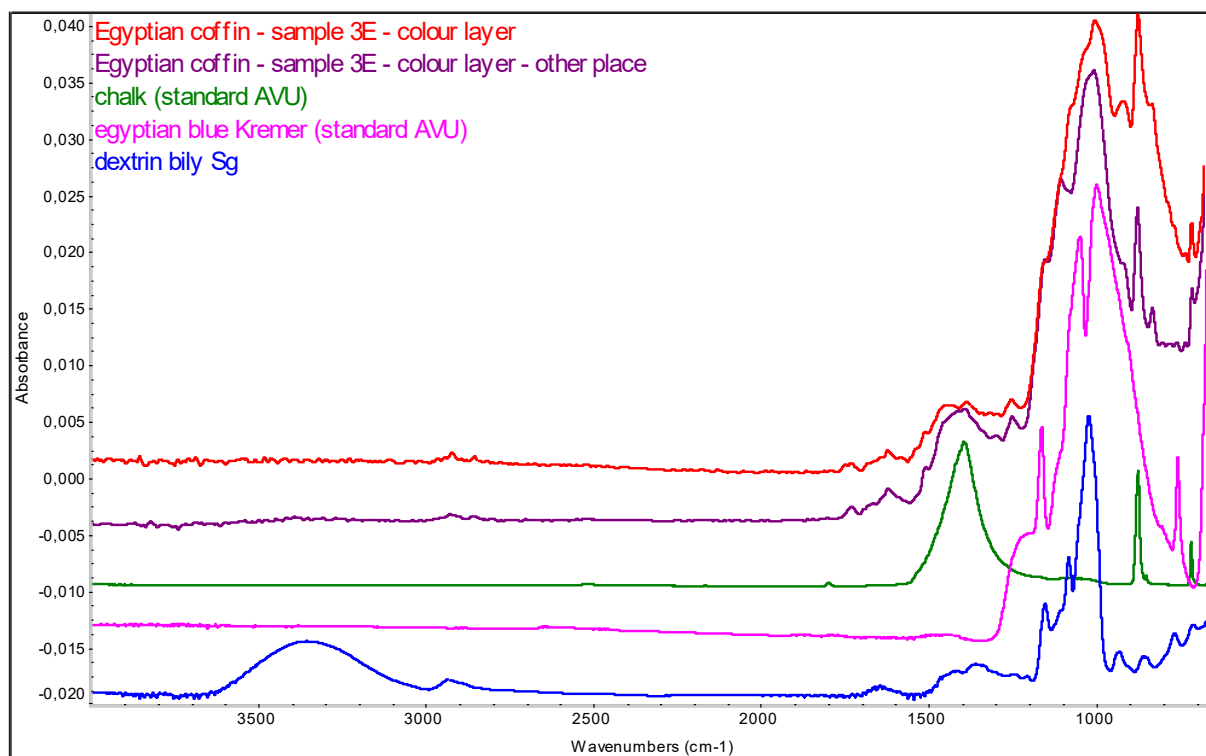
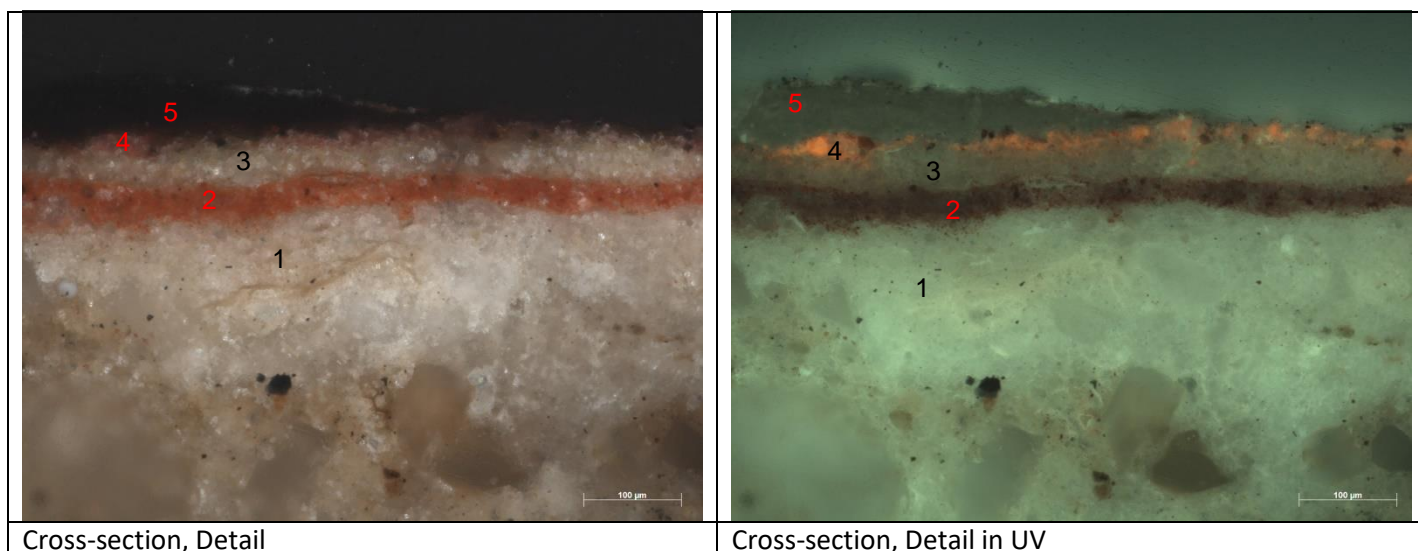


Fig. 4: Sample 3E - FTIR spectra of colour layer with spectra of standards. Pigments chalk and Egyptian blue, and polysaccharidic binding medium (standard dextrin) were identified.



Sample 10E

Fig. 5: Sample 10 red layer



1 – white underlayer

2 – red layer

3 – upper white underlayer

4 – upper red layer

5 – dark red layer

Fig. 6: Sample 10 - FTIR spectrum of non-embedded sample – white layer (1). Mixture of chalk and gypsum was found.

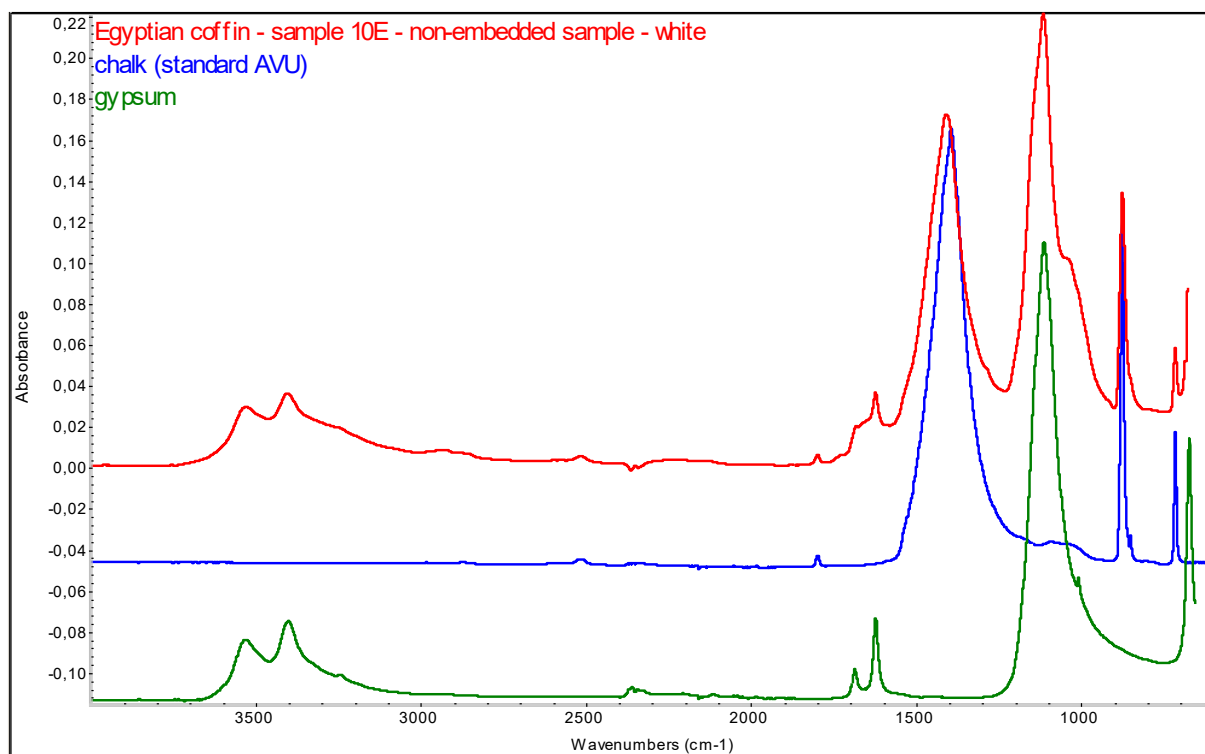


Fig. 7: Sample 10E - FTIR spectrum of white ground layer (1) with spectra of standards. This layer consists of chalk and oil.

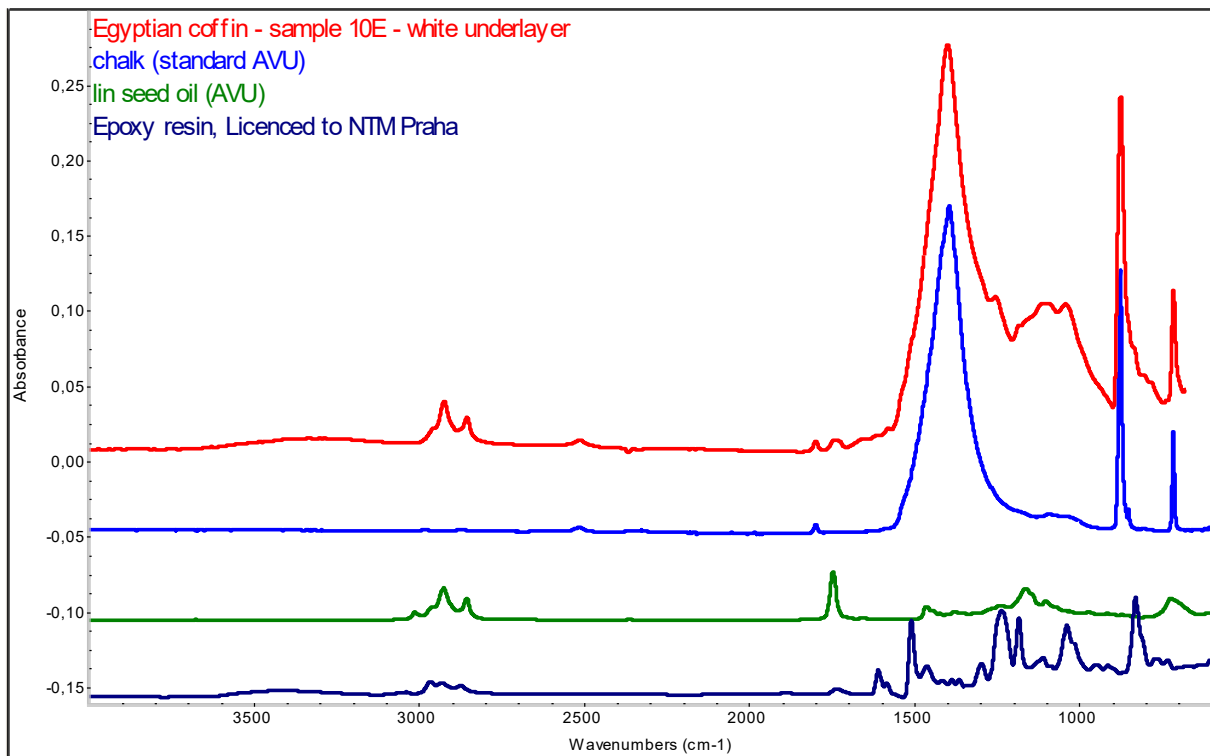


Fig. 8: Sample 10E - FTIR spectra of all red layers in summary.

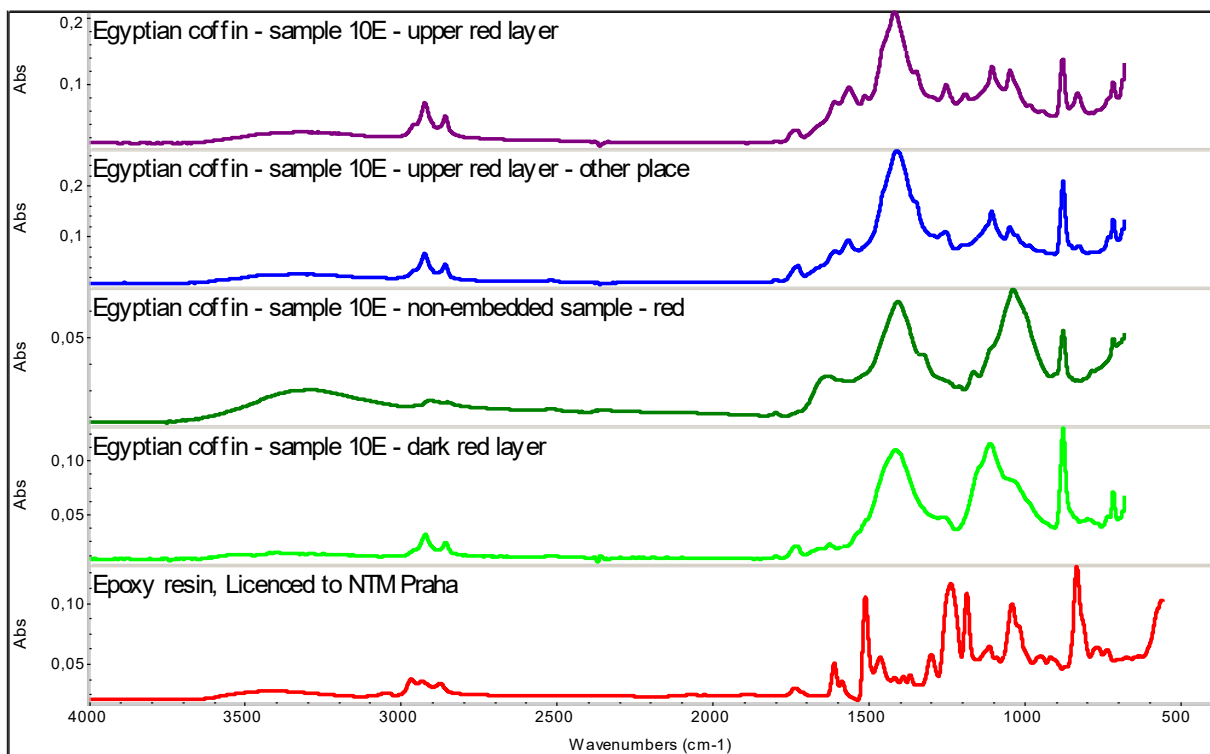


Fig. 9: Sample 10E - FTIR spectrum of white underlayer (3) up the red layer (2) with spectra of standards. Chalk and oil were identified.

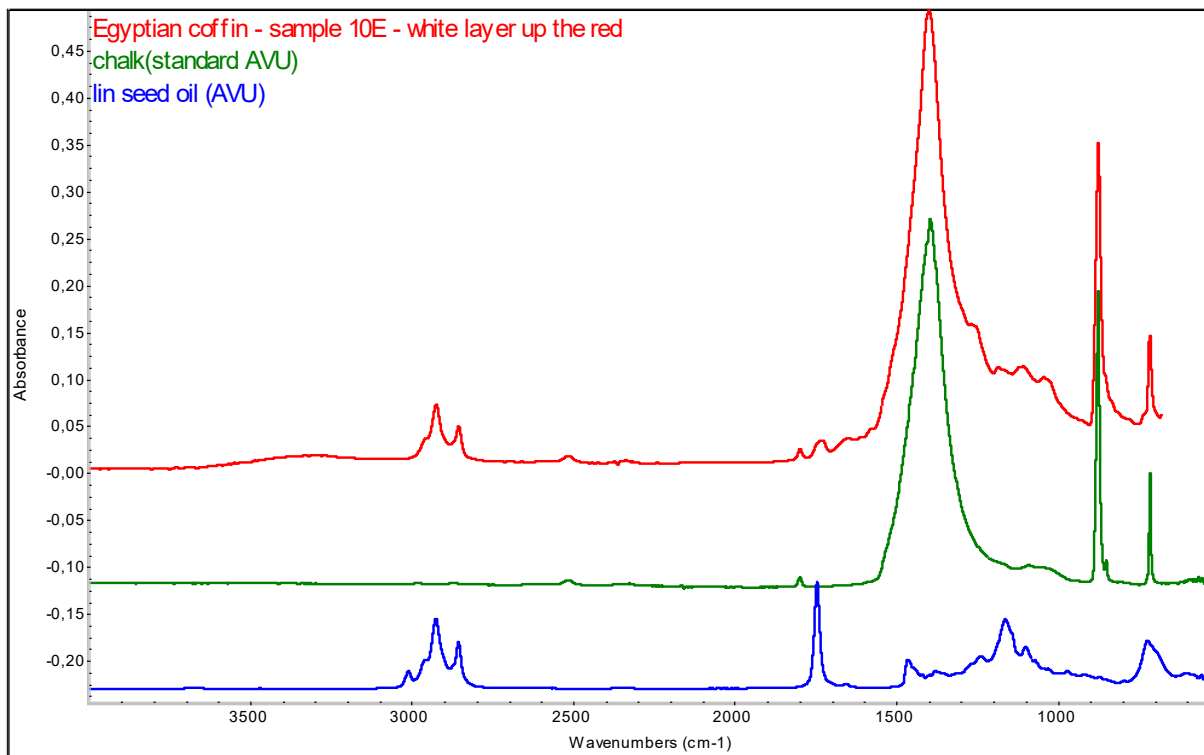


Fig. 10: Sample 10E - FTIR spectrum of upper red colour layer (4) with spectra of standards. Pigment red natural ochre (+ contamination with gypsum), chalk and oil as the binding medium were identified. In the spectrum, the strong contamination with epoxy embedding resin has been obvious.

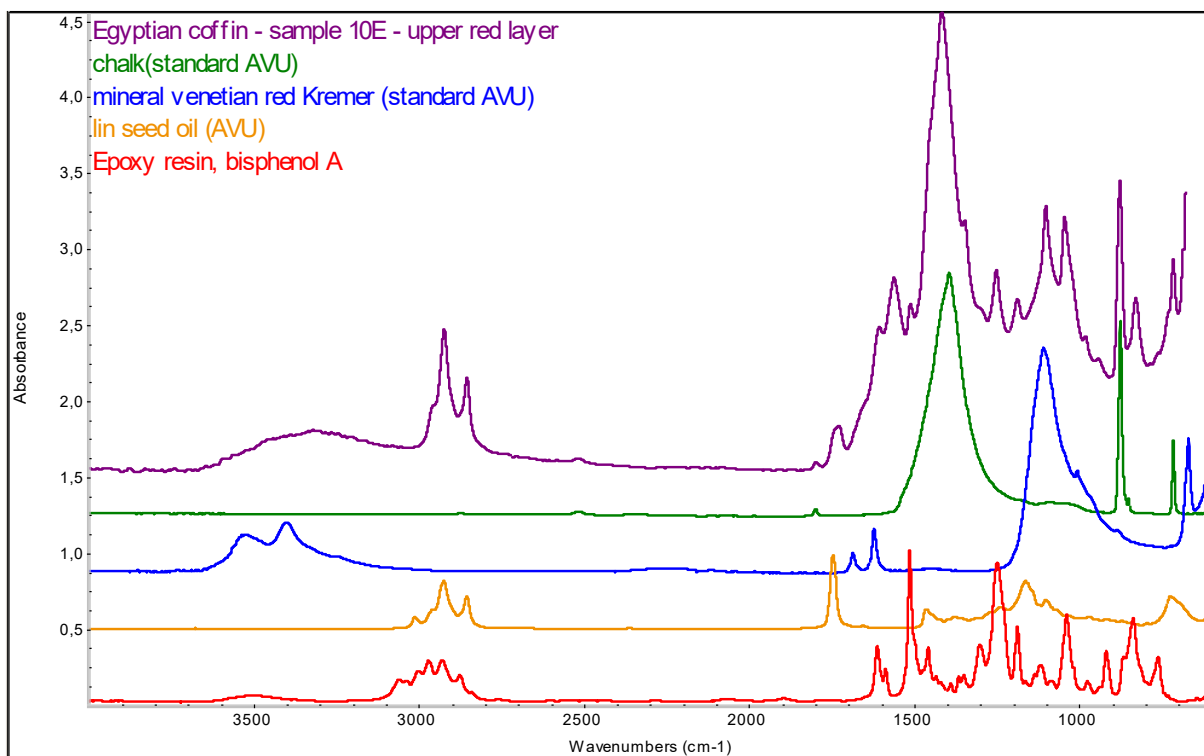


Fig. 11: Sample 10E - FTIR spectrum of upper dark red colour layer (5) with spectra of standards. Mineral red pigment (+ contamination with gypsum), chalk and oil as the binding medium were identified. Contamination with embedding resin is obvious.

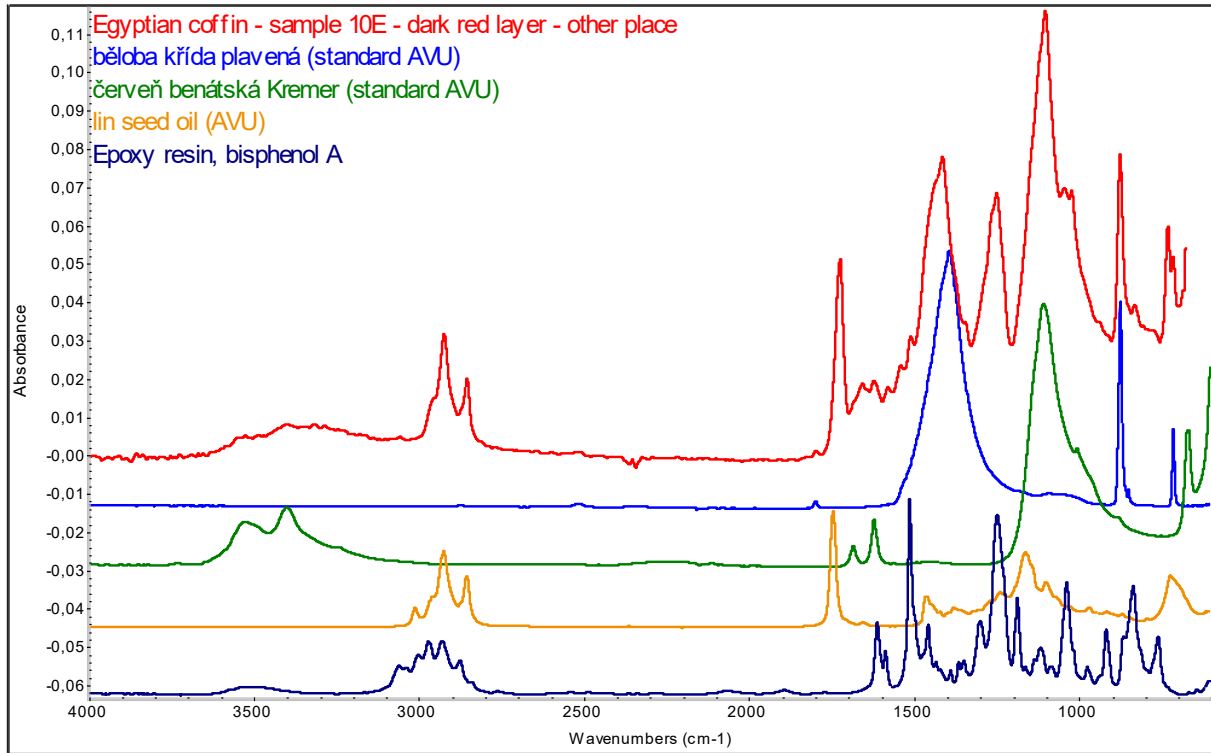
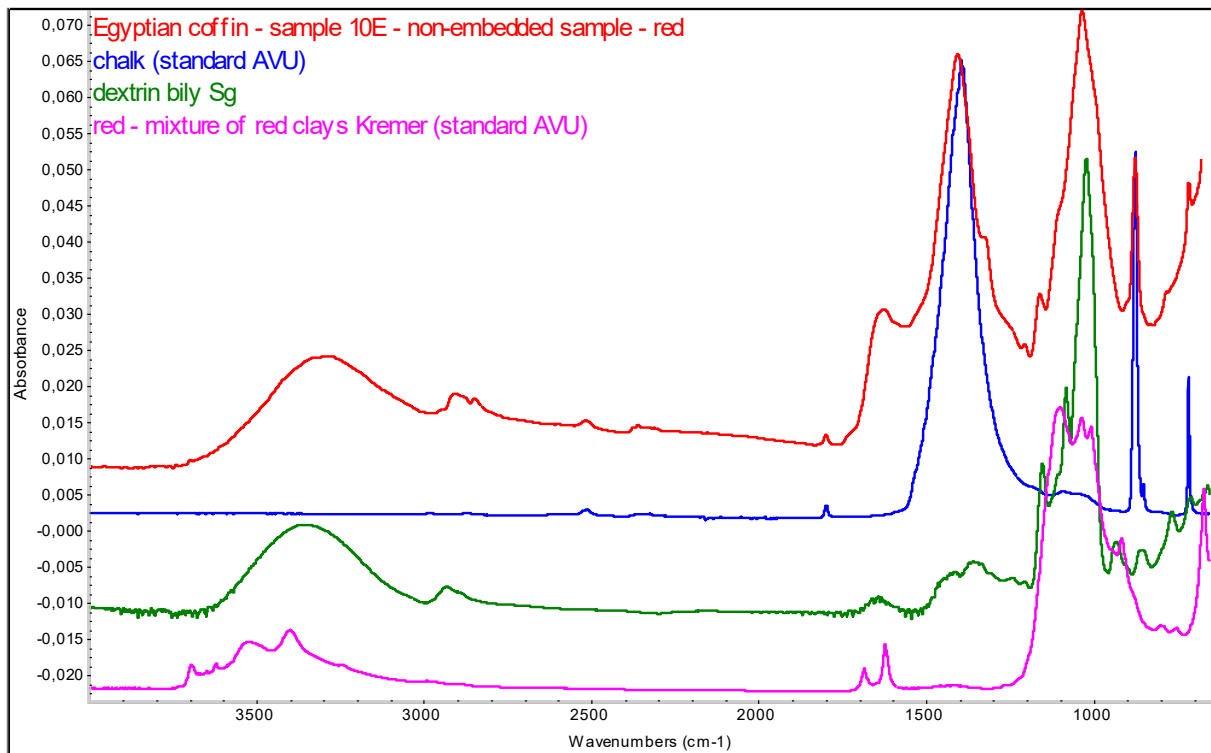
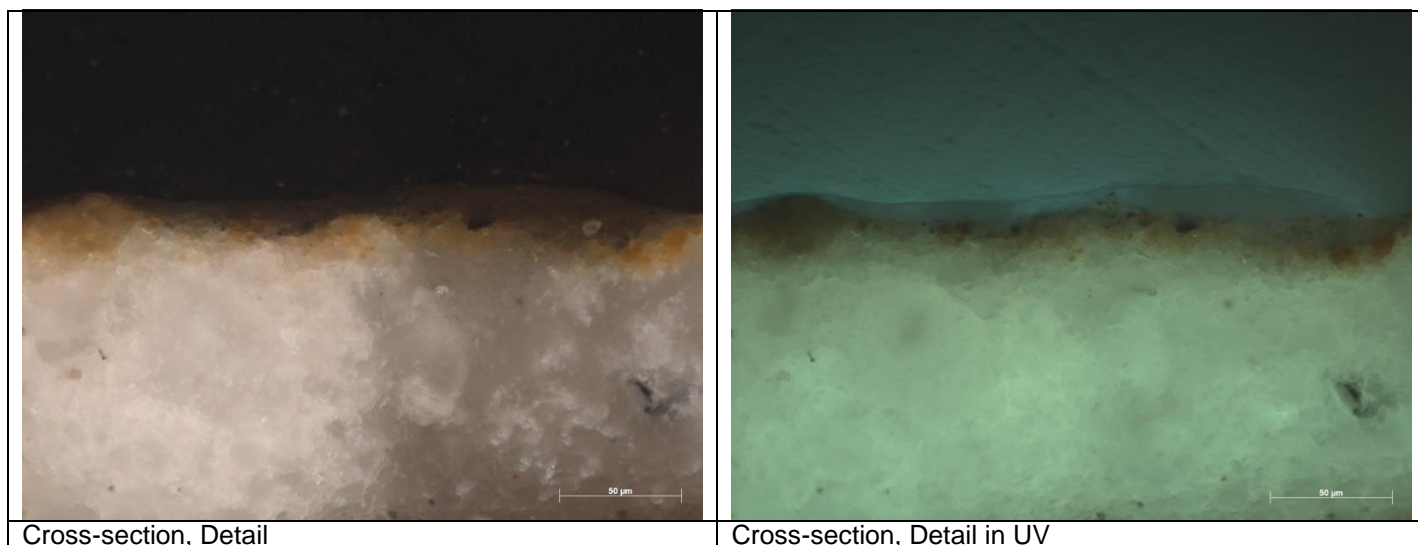


Fig. 11: Sample 10 - FTIR spectrum of upper dark red colour layer (5) non embedded sample with spectra of standards. Mineral red pigment (+ contamination with gypsum) and chalk were identified. As binding medium, probably a polysaccharidic compound (dextrin has been shown) can be determined.



Sample 14E

Fig. 12: Sample 14, yellow layer



Cross-section, Detail

Cross-section, Detail in UV

Fig. 13: FTIR spectra of sample 14E in summary.

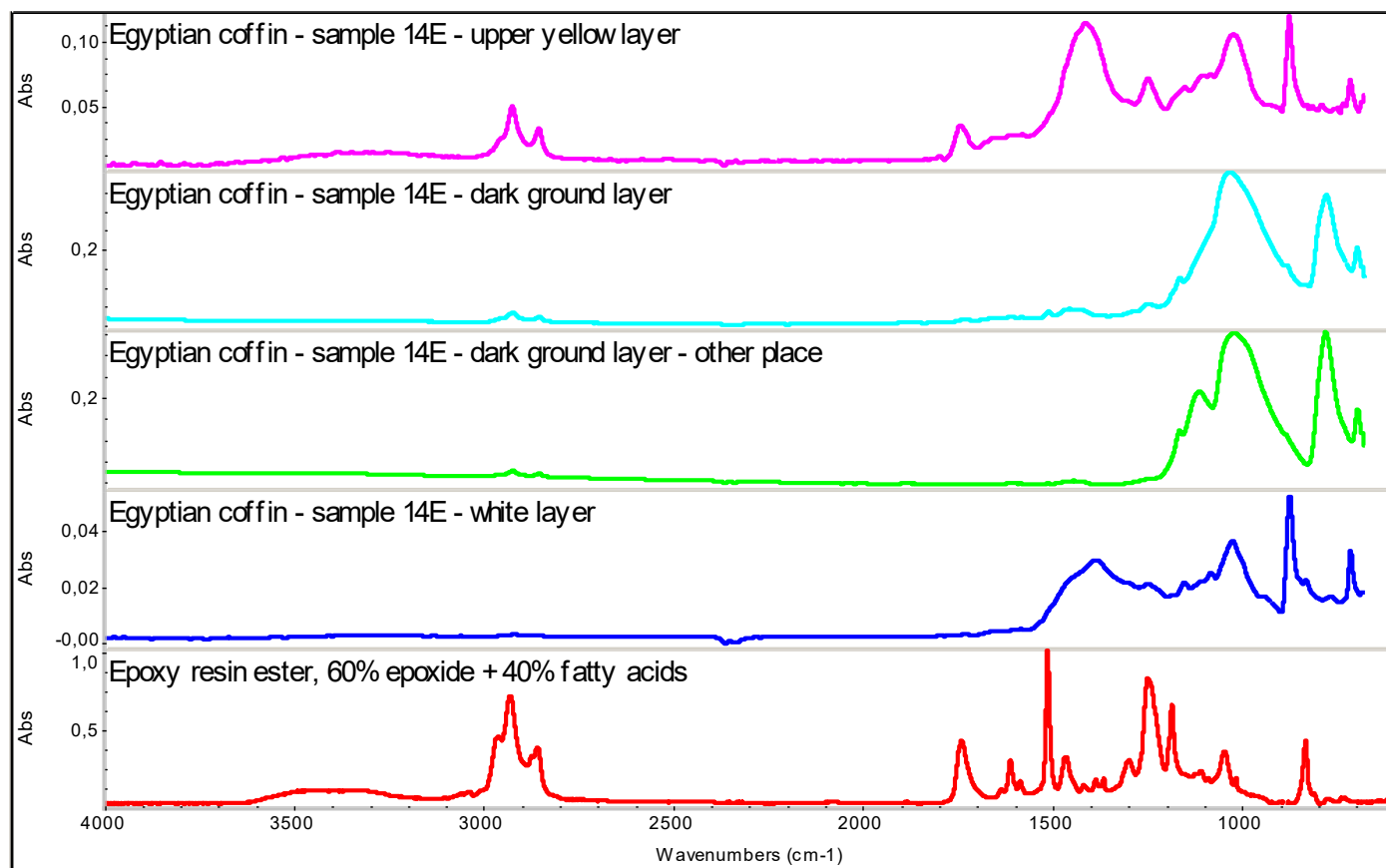


Fig. 14: Sample 14E - FTIR spectrum of white underlayer with spectra of standards. White chalk, polysaccharidic binding medium (dextrin has been shown) and contamination with epoxy resin were identified.

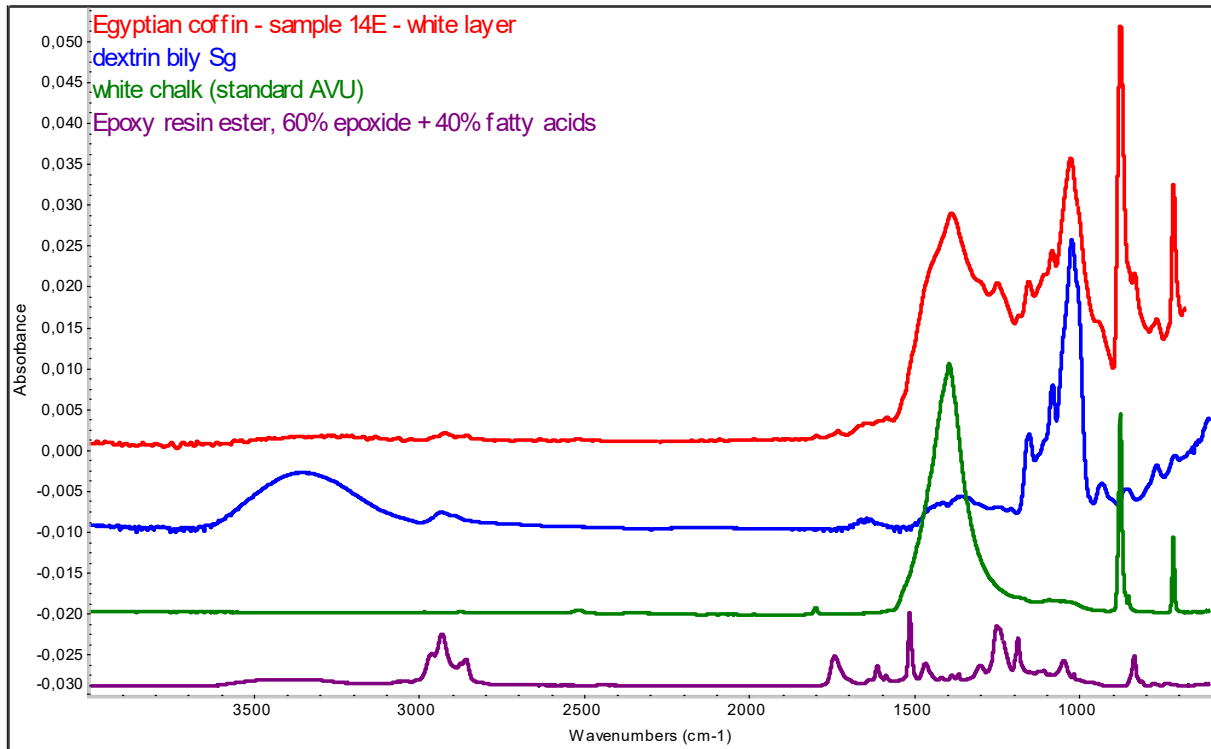
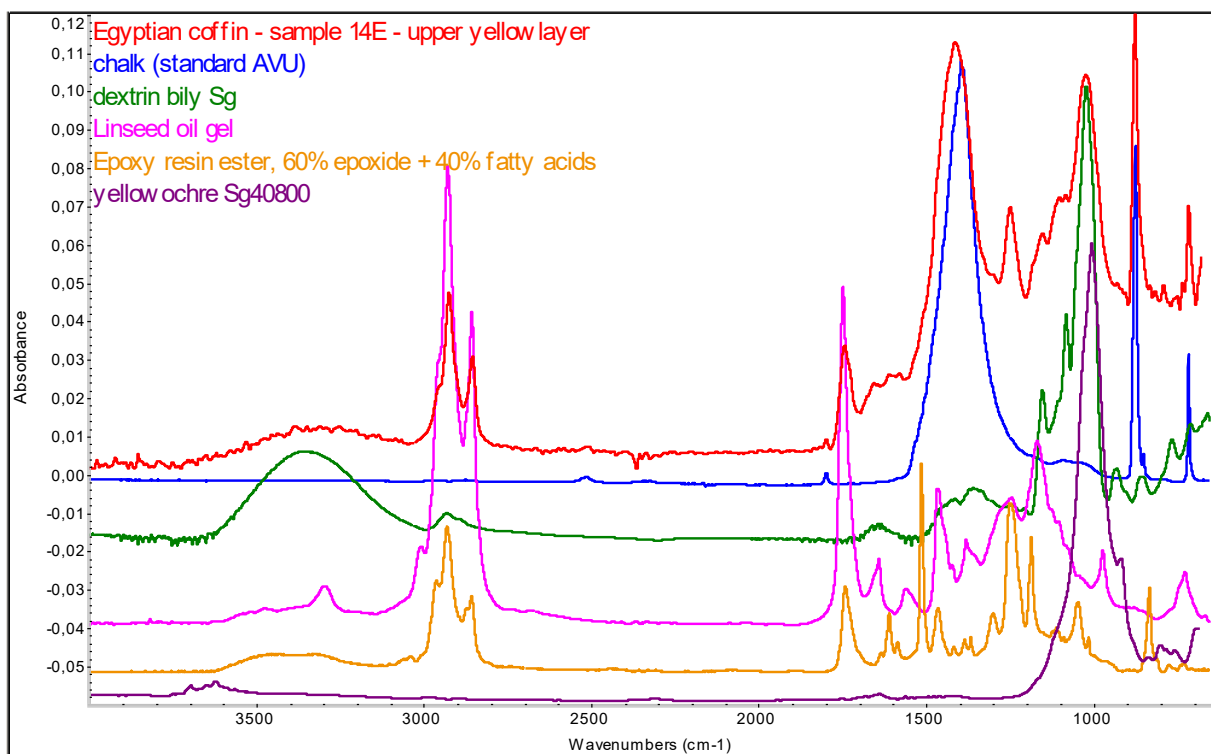


Fig. 15: Sample 14E - FTIR spectrum of upper yellow layer with spectra of standards. Yellow ochre, white chalk and polysaccharidic binding medium (dextrin has been shown) were identified. Because of contamination with epoxy resin the presence of oil cannot be confirmed.



CONCLUSION:

Samples 3 and 14: Ground layers consist of chalk (dark layer mixture of chalk and aluminosilicates – clay) and polysaccharidic binding medium (probably starch).

Starch is probably also binding medium of all colour layers.

In the sample 3 the Egyptian blue, as well as in the upper layer of sample 14 the yellow ochre have been identified. In all others samples natural ochres were identified.

Sample 10: In this sample there were two different types of underlayer identified. In the older underlayer (1) the chalk and gypsum have been identified. On the other hand in the younger white underlayer (3) only chalk and oil as a binding medium have been identified. Oil is probably the binding medium of all layers of this sample.

Some pigments have not a spectrum in the IR range.

Total 10 pages



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