

**A DIGITAL RADIOGRAPHY, UV FLORESCENCE, X RAY FLUORESCENCE,  
AS WELL AS FOURIER TRANSFORM INFRARED AND RAMAN  
SPECTROSCOPY COMPLEX INVESTIGATION OF A WOODEN PAINTED  
MODEL**

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For a correct identification of pigments and binders used in painting icons of 18th-19th centuries, a reference panel was created by using the same type of material and the same technique as in contemporary works from that period. The panel was made of lime wood dried for two years and painted by using the Kremer Pigments GmbH & Co. KG pigments, as this company produces pigments by using both classic recipes and original raw material. In this case, white and minium lead, cinnabar, orpiment, ocher, lazurite as well as gold leaf were chosen. The paints were prepared by traditional tempera technique with egg yolk as binder. At the same time, a turpentine diluted damar resin was used as varnish.

The panel was divided into eight fields, each covered with only one type of paint. A field was left without paint in order to evidence the preparation. To investigate the possible effect of varnish, this was applied so as to cover only half of each field.

More noninvasive and complementary techniques were used to investigate different peculiarities of traditional painting on wooden panel: digital radiography (DR) and UV photography (UVP), X-ray fluorescence (XRF) as well as Fourier-Transform Infrared (FT-IR) and Raman spectroscopy.

While DR evidenced not only wooden plane texture but the minute differences between pigments as related to their mineral composition, UVP was useful in discerning mainly lead and mercury pigments by a specific fluorescence color. At its turn, XRF allowed identifying all pigments by evidencing the presence of specific elements, and, at the same time, the existence of a certain degree of mixing between pigments, a common characteristic of all paintings. FTIR was very utile in evidencing the proteic motietis characteristic for the hen yolk used as binder, while FT-Raman spectroscopy confirmed the presence of cinnabar and white lead pigments.

All results allowed clarifying more aspects related with the use of physical, noninvasive methods of investigation for the old school paintings.