

Characterization and formulation of egg-tempera paint with sienna pigment

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Between the 13th and 15th centuries, in Italy, egg-tempera painting was the predominant technique before being superseded by oil paint. This practice consists in mixing pigments with an aqueous binder, in this particular case, egg yolk. Among the different types of pigments, painters were using natural earths as a first layer for painting flesh tones. Sienna has been known to be part of the painter's palette in the Middle Ages, and has been identified on artworks painted *a tempera*. It is mainly composed of clay minerals and iron oxides [1].

Ancient recipes have been collected in order to reconstitute paints in the laboratory according to medieval processes. Their properties (texture, stability, conservation) differ according to the ingredients and their proportions. The rheological characterization shows that our reconstructions have a shear thinning behavior. Due to the high proportion of swelling clay, the resulting paint is well homogeneous because the pigment is suspended in the binder. Adsorption isotherms of simplified systems combined with IR spectroscopy allow to study the adsorption of the binder on the pigment.

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Références :

[1] D. Hradil, T. Grygar, J. Hradilová, et P. Bezdička, « Clay and iron oxide pigments in the history of painting », *Applied Clay Science*, vol. 22, n° 5, p. 223- 236, avr. 2003, doi: 10.1016/S0169-1317(03)00076-0.

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