QUANTITATIVE ANALYSIS OF BINDING MATERIALS IN PAINTS

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Paints are complex multicomponent mixtures, that consist of organic binders (oils, waxes, proteins or their combinations, in modern times also numerous synthetic binders), pigments (inorganic or organic) and various additives. Due to their chemical nature paints age with time and the organic constituents undergo complex reactions (mainly degradation), to produce foreign compounds and therefore further adding complexity to the chemical analysis. [1] All this makes chemical analysis of such materials difficult. For obtaining the maximum possible amount of information from such complex paint samples, accurate methodologies for the analysis of small sample amounts and very low analyte contents, are needed.

Binders are analysed mainly qualitatively, right now quantitative approaches are very limited [2]. The purpose of the work ahead is to develop a set of methodologies using complementary techniques (GC-MS, FT-ICR-MS with MALDI, APCI and ESI sources, ATR-FT-IR, SEM-EDS etc) for thoroughgoing quantitative investigation of the composition of one- (oils, proteins, etc) or two-binder systems (oil-protein, oil-wax, etc) in the paint mixtures. Quantitative (or semiquantitative) analysis approach would help to obtain the maximum information from the objects of cultural heritage. The developed quantitative methodology will be applied to the paint samples taken from the different cultural heritage objects relevant to the Estonian art history.

References

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2. F. C. Izzo, 2010, PhD thesis.

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