FT-IR and EDXRF Analysis of Wall Paintings of Ancient Ainos Hagia Sophia Church

S. Akyuz[1], T. Akyuz[1], S. Basaran[2], I. Kocabas[2], A. Gulec[2], H. Cesmeli[2]

[1]*Istanbul Kultur University, Science and Letters Faculty, Physics Department, Atakoy Campus, 34156 Bakirkoy, Istanbul, Turkey*
[2]*Istanbul University, Letters Faculty, Department of Restoration and Conservation of Artefacts, Vezneciler, 34134, Istanbul, Turkey*

The ancient Ainos was founded at the northern coast of the Aegean Sea and it is one of the most important archaeological sites in Turkey. In this study the wall paintings of ancient Ainos Saint Sophia church were investigated by FT-IR and EDXRF spectroscopy.

The identification of pigments used for archaeological artifacts is important for their restoration, conservation, dating and authentication. The aim of this study is to investigate the chemical composition and manufacture techniques of the wall paintings of ancient Ainos Saint Sophia church dating back to Byzantine age (12. century AC)

Quartz, gypsum and calcite were detected in all the samples. Feldspar phases were inferred from the second derivative profiles of the IR spectra. Black, dark brown and red coloration was due to different concentrations of MnO_2, magnetite and haematite. In the case of black samples, calcium phosphate bands were also observed.

Fig. 1: Ancient Ainos Hagia Sophia Church.