

Materials micro infrared spectroscopic identification in works of art: The case of Saint Demetrius of Stomion

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ABSTRACT

The preservation of cultural heritage artifacts is the main subject of Archaeometry, a science, which includes the collaboration of many sciences in order to accomplish dating, analysis, restoration and especially conservation of works of art. Micro Infrared Spectroscopy (micro –FTIR spectroscopy) is a characterization technique which is classified as a non-destructive method and it is based on the interaction of the infrared region of the electromagnetic spectrum with matter.

The advantages of the method, which prove its significance, are that requires minimal sample (dimensions down to $20 \times 20 \mu\text{m}^2$), and is relatively quick compared to most techniques -both in the preparation of samples and the obtaining of spectra. It is capable of stratigraphic analysis, with extreme sensitivity and accuracy and it enables researchers to identify organic and inorganic compounds (such as pigments, binders, preparations, varnishes etc.) as well as the preparation technique. Additionally, it can also detect the possible aging of compounds. These main advantages of the method prove its significance thereof.

The monastery of Saint Demetrios is placed at Stomion (Tsayesi) in the geographical area of Larissa town, Thessaly, Greece and has an interesting historical background because recent excavations have revealed the remnants of a catholicon dated circa in the 12th century while the present one has been dated in the 16th century. Two major destructions by fire, one in 1868 and the other in 1943, have caused the collision of the most part of the wall paintings, which have been dated in the 18th century, with remnants only in the side chapels (typikaria).

During the recent works of restoration, samples were taken and were analyzed by means of spectroscopic techniques in order to examine the used pigments, binders and other materials for the purpose of a first attempt to date the wall paintings. This study demonstrates that micro infrared spectroscopy is one of the most important methods in archaeognostic research.