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Analysis of gold-leaf glass tesserae using micro-PIXE/PIGE

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The use of gold-leaf glass tesserae begun in roman times along with the development of wall mosaics and established during the byzantine period. Gold-leaf tessera is a unique type of glass tessera due to its sophisticated manufacture technique - a metal leaf is enclosed between two layers of normally transparent glass. Published data on gold-leaf glass tesserae are limited and mainly focused on the composition of the glass and gold.

The research aimed to establish a non-destructive investigation of nature and decay of gold-leaf glass tesserae. Systematic examination of a large number of tesserae was followed by analysis of selected tesserae. Tesserae were analysed as received, without sample preparation, using Scanning Electron Microscopy coupled with Energy Dispersive x-ray Spectroscopy (SEM/EDX) and supplementary micro-Proton Induced X-ray and γ-ray Emission Spectrometry (μ-PIXE/ PIGE). μ-PIXE/ PIGE analysis was carried out using the scanning nuclear microprobe installed at the 5 MV Van de Graaff electrostatic accelerator of the Institute of Nuclear Research of the Hungarian Academy of Sciences (ATOMKI-HAS) in Debrecen, Hungary, via the Financial support by the Transnational Access to Research Infrastructures activity in the 7th Framework Programme of the European Union (CHARISMA Grant Agreement no. 228330).

In the context of this presentation results of μ-PIXE/ PIGE analysis of gold-leaf tesserae would be provided, demonstrating the efficiency of the selected methodology.

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