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Obsidian provenance determination by using the beam stability controlled BSC-XRF and the PIXE-alpha portable spectrometers of the LANDIS laboratory of the LNS-INFN and IBAM-CNR in Catania (Italy)

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About 1300 obsidian artefacts coming from various archaeological sites of Sicily were analyzed by using the BSC-XRF (Beam Stability Controlled – X-ray Fluorescence) and PIXE-alpha (Particle Induced X-ray Emission, using low energy alpha particles) portable spectrometers developed at the Landis laboratory at the LNS-INF and IBAM-CNR in Catania (Italy).
The portable BSC-XRF system allows the non-destructive analysis of the Rb, Sr, Y, Zr and Nb trace concentrations, which are considered to be characteristic of the obsidian samples and consequently are indicative of the provenance quarries.
Quantitative data on Rb, Sr, Y, Zr, Nb trace element concentrations where deduced through the use of a method that makes use of a multi parameter linear regression, previously
The portable PIXE-alpha spectrometer allows the quantitative determination of the matrix major elements, from Na to Zn.
In the present work the two instrumental devices are presented.
The data are from: Milena (Cl), Ustica (Pa), Rocchicella (Ct), Poggio dell'Acquila (Ct), San Marco (Ct), Villaggio del Petraro* (Sr) and Licodia Eubea* (Ct).
Results on compositional data for trace elements and major elements allowed to identify Lipari and Pantelleria islands as the only two sources of the analysed samples.
Analyses carried out on vitreous artefact found in Rocchicella, showed for the first time that the Palagonite was used as row material.

*Preliminary data.

Topic of conference: Application of XRS in archaeometry

Kind of presentation: oral