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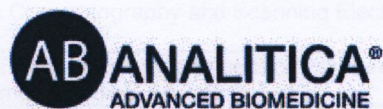
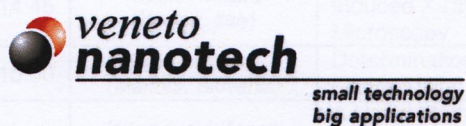
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## Characterization of Polychrome pre-Roman Glasses by Laser Ablation ICP-MS

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### Abstract

The wide period from the end of the 3<sup>rd</sup> millennium to the end of 1<sup>st</sup> millennium B.C. (bronze and iron ages) is considered the first step in the history of the technology of the ancient glass production. There are several papers about the chemical composition of the bronze-age glasses, mainly from Egypt, Near-East and Aegean area, but only few physico-chemical studies about the glasses of the iron age [1-4].

This work presents the preliminary study of a small set of polychrome glass samples - fragments (glass vessels and ewers) from 5<sup>th</sup> to 2<sup>nd</sup> century B.C., made with the so called "core forming" technique. They were found in an Etruscan archaeological site of Adria in North-East Italy, but were probably produced in the Aegean area. All the samples feature different decorative coloured glass patterns on the surface of a main blue glass core and show inhomogeneous morphologies, with many bubbles and inclusions.

The aim of this work was the elemental analysis of the samples, in order to get information about the nature and the origin of the sands, fluxes, chromophores and opacifiers used for their production. This can help to state the points of continuity with the production technology of the glasses on the previous and following periods.

The glass samples were analyzed by the ICP-MS technique with solid sampling by laser ablation (LA). 54 elements were measured, forming matrix, major, minor and trace constituents of the samples. The experimental procedure uses the advantage of the sum-normalization calibration approach, developed at the L-04 Laboratory of the National Institute of Chemistry in Ljubljana, Slovenia, using a high quality set of glass standards for the calibration purpose [5]. Bivariate and multivariate analysis of the data obtained by LA-ICP-MS may help us in the characterization of the glasses in terms of the production technology and possible provenance. A further characterization of samples was attempted by LA-ICP-MS surface rastering to obtain high quality elemental maps.

### Acknowledgement

We are grateful to Dr. Simonetta Bonomi, former Director of the Museo Archeologico Nazionale di Adria and now Soprintendente ai Beni Archeologici della Calabria, for the supplying of the glass samples and the related cultural support.

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