FINGERPRINTING CARPATHIAN OBSIDIANS BY PGAA: FIRST RESULTS ON GEOLOGICAL AND ARCHAEOLOGICAL SPECIMENS

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Obsidian is one of the classical subjects of archaeometrical analyses. Most analytical methods however will require destruction or preparation of the sample equal to destruction. Therefore most of the choice pieces are not to be analysed by these methods. PGAA is suitable for analysing the pieces without destruction and without any residual radioactivity. The pieces were placed into the analytical equipment without any special preparation, intact and naturally, without any destruction or sampling. 2?2 cm^2 of the sample surface was irradiated by a cold neutron beam of $5?10^7$ $cm^{-2}s^{-1}$ flux. Since neutrons penetrate the whole sample, the information we get reflects the bulk composition of the material, which is very advantageous for the glassy, homogeneous volcanic glass (obsidian).

The question is how distinctly we can separate different source regions according to the detected components, and how effectively we can allocate the archaeological pieces into the resulting data sets. Our results of two measurement series seem promising, however we are working on extending our database of PGAA measurements concerning obsidian archaeological, as well as geological samples.

Geological samples from all the important known obsidian sources of the Mediterranean region were measured with special regard to Central European (Carpathian I, II) sources, as well as archaeological sources mainly from Hungary. Elements detected in obsidian include main components (H, Na, Al, Si, K, Ca, Ti, Mn and Fe) accessory- and trace elements (B, S, Cl, Cr, Sm and Gd). The distinction of the sources was made using series of bivariate plots and Principal Component Analysis. PGAA proved to be effective in separating Carpathian I, IIE, IIT groups set on the in accordance with NAA and supported by other analytical techniques (EDS-XRF, PIGE-PIXE) as well.