

APPLICABILITY OF PROMPT GAMMA ACTIVATION ANALYSIS TO ARCHAEOOMETRY OF POTTERY

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According to our first experiences, Prompt Gamma Activation Analysis (PGAA) is well applicable to pottery archaeometry. PGAA is a non-destructive bulk analytical method, capable to determine concentrations of most major- and some trace components. Without sampling our preparation of the object, we are able to quantify the major components (SiO₂, TiO₂, Al₂O₃, Fe₂O₃, MnO, MgO, CaO, Na₂O and K₂O) of the bulk material. In most cases, accessory- and trace element concentrations, like B, Cl, Sc, V, Co, Cr, Nd, Sm, Eu and Gd can be determined, too.

In the course of proficiency studies, selected objects have been analysed with PGAA, XRF and INAA too. As an outcome, the agreement between the PGAA and XRF data are good. Although XRF exhibit a better sensitivity for most components, PGAA provides the additional possibility to determine the concentration of B and H.

With the help of H (i.e. H₂O) measurements, the effect of firing on the composition of clay can be ideally tested, as we demonstrated.

In this paper, we give examples of our PGAA investigations on ancient ceramics.

In an occasional co-operation with the Simón Bolívar University, Caracas, we have investigated pre-Columbian ceramics figurines found in Venezuela. Based on some significant element ratios and also on Principal Component Analysis of the data, one can clearly distinguish between the objects of two different provenances.

Within the frame of a MÖB-DAAD project, aimed to investigate Hungarian Neolithic pottery, we have analysed pottery fragments and soil samples from settlements of Szarvas-Endrőd and Tiszalúc region (South-East Hungary and North-East Hungary, respectively) – see Taubald et al., in this Conference.

We took part in a Proficiency Test – organized by the IAEA – on Chinese porcelain reference sample that has resulted in the following outcome: All the identified components with PGAA agreed with the reported target values, excluding Na, which we have quantified with a significant deviation from the target value.