

CHARACTERIZATION OF ANCIENT CERAMICS BY PHYSICAL – CHEMICAL ANALYSIS

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For the study the ceramics, dating from the centuries I-II A.C., and discovered during the archaeological excavations done at Dumbrava-Iași, Romania, there have been done analyses of microscopy in polarized light, in an attempt to identify the mineral clay compounds and the non-plastic inclusions. To complete the data obtained through petrographic analyses, we also used the X-rays diffraction.

The analyses focused on eight samples (no.1-8). According to the data obtained using the petrographic analyses, they were grouped as following: 1-5; 2-3; 4-6-7-8. The differences of composition among the samples are minor and accidental. In the samples, there are minerals such as mica, feldspars and some others specific to these sorts of clay, and quartz, whose predominant presence makes us think that the sand was the main non-plastic inclusion used.

With regards to the work procedure, the orientation of the inclusion in parallel layers, shown by the thin sections, indicates that the ceramics was executed using a wheel.

Concerning the combustion temperature, only an approximate judgment can be made. Taking into account the glassy aspect of the paste and the presence of some minerals that decompose themselves or become amorphous over a certain temperature, such as the calcite, the sericite, the orthoclase, etc., we can conclude that the combustion temperature varied between 600°C and 750°C. The hematite, found in most of the samples, indicates the presence of an oxidant medium.

The same samples were submitted for X-ray diffraction analyses. The comparative study of the X-ray diffraction patterns of the samples points out a similar composition of the eight samples. The minerals identified by X-ray diffraction, present in different proportions in these samples, are the following: quartz, biotite, potash mica, sericite, orthoclase, oligoclase, albite, hematite, calcite.

Taking into account the aspect of the X-ray diffraction patterns, the samples were grouped as following: 1-3-4; 5-6-7-8; 2.