Photoacoustic Spectroscopy Analysis of Archaeological Pottery Samples from Northern Mesoamerica

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Physical characterization techniques have been applied to archaeological pottery samples with the main purpose of answering where, when, and how were they made [1]. Photoacoustic Spectroscopy (PAS) has been used to study natural pigments in Aztec pottery in order to know composition and technology of the pottery manufacturing process [2]. Also, pre-Columbian pottery fragments found in Buenavista archaeological site, Valle de Ojocaliente, Zacatecas have been dated using archeomagnetic properties [3]. The present work is focused on the optical and morphological characterization of fragments from this same location, where eight samples were selected considering different domestic and ceremonial contexts. In order to obtain the optical absorption spectra, PAS was performed on both the interior and the exterior of the samples. The conducted analysis showed similar optical properties in all of the fragments. Differences between the photoacoustic signal of the interior and exterior of the samples can be attributed to the presence of different pigments. Additionally, XRD and EDS analysis were used to determine the chemical composition and micromorphology of the ceramics. The presence of the same elements and phases may give relevant information about the origin and production of the samples.

References:

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[3] “Archeomagnetic dating of some Pre-Columbian pottery fragments from northern Mesoamerica: Implications for the chronology of central Mexico during the Epiclassic period,” *J. Archaeol. Sci. Reports*, vol. 4, pp. 32–43, Dec. 2015.