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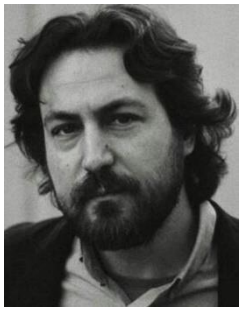
A Preliminary Case Study on the Conservation of Mudbrick Materials Used in Neolithic Architecture of Central Anatolia



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ABSTRACT

This case study focuses on determining the composition of Neolithic mud brick materials found in the Melendiz region, located within the borders of Niğde province in the volcanic Cappadocia region of the Republic of Turkey. The aim of this case study is not so much the analysis of Neolithic mud bricks themselves, but rather the determination of the chemical, physical, and mechanical properties of mud brick made using traditional construction techniques from the Neolithic period. The mud brick blocks considered for determining material properties consist of products created by mixing the components of traditional construction techniques in varying proportions. The mud brick blocks, prepared with three different clay/soil ratios, also had varying amounts of straw added to them. The clay material used in this study was obtained from clay sources near Tepecik- Çiftlik mound, a Neolithic settlement in the Melendiz region. These mud brick blocks, produced using traditional methods, are ready for examination after being dried in the shade and then fired in an open kiln over an oak wood fire. SEM analyses were performed on these prepared samples to determine their morphological structures, and XRD analyses were performed to determine their chemical content. Compression and bending tests were conducted to determine the mechanical properties of the adobe blocks. One of the aims of this study is to shed light on the selection of reinforcing materials to be used in the conservation of mud brick blocks that the analyses and tests conducted, through especially those used in Neolithic architecture. The properties of materials used in strengthening mud brick blocks and plasters are scientifically necessary to better determine their effectiveness in Neolithic architecture. Based on previous research, materials used in the conservation of mud brick blocks and plaster did not yield clear results or did not meet the desired level during their general use and This study will shed light on better methods for preserving Neolithic mud brick materials.

KEY WORDS:

Mud Brick, Neolitic Architecture Conservation, SEM and XRD analysis, Compression and Bending Tests