



Variable properties of Kızılıkaya ignimbrite used in some historical monuments of Cappadocia, Turkey

Burcu Ertas Deniz and Tamer Topal

Middle East Technical University (METU), Department of Geological Engineering, Ankara, Turkey

Cappadocia is an important region in Turkey with its ancient monuments and historical buildings. Ash-flow tuffs (ignimbrites) were dwelled and used for the construction of church, caravanserai and other old and new structures. Kızılıkaya ignimbrite (Lower Pliocene) is a welded tuff with different and variable physical and mechanical properties in different locations. It is red, grey, and pink, colored and exhibits a columnar structure with red-coloured pumice, volcanic pumice and volcanic fragments. Tepesidelik caravanserai and dwellings in Ihlara valley are the places where Kızılıkaya ignimbrite was used.

In this study, Sevinçli quarry where the Kızılıkaya ignimbrite crops out was examined. The Sevinçli quarry was located 8 km east of the Aksaray. The Kızılıkaya ignimbrite has two different colored ignimbrite levels in this quarry due to the spreading out of the ash-flow material. This study investigates the properties of the unit at two different levels of the ignimbrite from both field observations and laboratory tests. The laboratory tests revealed that wetting-drying, freezing-thawing, and salt crystallization reduce the strength of the ignimbrite. Dark pink-red colored ignimbrite used in Ihlara Valley is found to be more resistant to the ageing tests than the light gray ignimbrite used in the Tepesidelik caravanserai.