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Abdelmegeed, M.* & Hassan, S.	أسماء المؤلفين
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DIAGNOSTIC INVESTIGATION OF DECAYING LIMESTONE IN HISTORICAL BUILDINGS AT THE MAMLUKS CEMETERY- CITY OF THE DEAD, EGYPT

Abstract

The Mamluks cemetery, City of the dead, is one of the famous historical Islamic places that contain many outstanding structures. Limestone, which is the main building material used in the Mamluks cemetery buildings, always underwent weathering processes and deterioration factors. The present study is an analytical and petrographic assessment of limestone used in historical buildings in Cairo-Egypt. It is organized into three main sections. The first section provides a historical background of Mamluks cemetery. The second one sets out to evaluate the current situation of the decaying limestone. The third section explains the alteration mechanisms between deterioration forms and surrounding environmental factors. Visual, microscopic, and laboratory analysis by means of PM, XRD, and EDX highlighted the causes of limestone decaying. The decay phenomena of limestone in the (City of the dead) are independent of the exposure of the architectural surface and are strongly influenced by the sedimentary nature (micro laminations), which acts with the formation and distribution of salts as preferential planes for the formation of aggressive weathering forms. Another issue is related to the formation of cavities. Furthermore, small quartz grains occasionally occupy some shell cavities (chambers).