Geophysical Research Abstracts
Vol. 14, EGU2012-5944-1, 2012
EGU General Assembly 2012

Characterization of historical mortars in Jordan

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This paper presents the petrographic and mineralogical characterization of mortars from different archaeological sites in Jordan which encompass Nabatean, Late-Antique and Early Islamic (Umayyad) sites, in some cases offering a sequence of different period mortars from the same building. These sites include the Nabataean city of Petra, the Late Antique town of Umm al Jimal and the castle of Qasr Al Hallabat. These mortars were produced with different raw materials and manufacturing technologies, which are reflected on distinctive variations of mineralogy, texture and crystal size and aggregates composition (including volcanic ashes, ceramic fragments, burnt organic material) size and their puzzolanic properties. As a consequence these mortars present different physical properties and reveal nowadays very different states of conservation. There is a dramatic change in mortar properties between those manufactured in pre-Islamic period and those from early Islamic – Ummayad times with a general trend in which these last ones present coarser crystal and aggregate sizes with less puzzolanic aggregates that result in less durable mortars. All of this reflects changes in the different stages of production of the mortar, from the use of either hydraulic, lime putty or slaked lime and the selection of aggregates to the application techniques (polishing). This reflects the evolution of building technology that took place in this area during early Islamic period and how petrological information can shed light on historical interpretation of building technologies.

Research funded by AECID (PCI A/032184/10), GEOMATERIALES (S2009/MAT-16) and MCU (Analisis y Documentación de tipología arquitectónica y técnicas constructivas en el periodo de transición Bizantino-Omeya en Jordania)