#01384
Mortars from the Monastery of Santa Maria de Alcobaça, in Portugal: characteristics and functions

U. Merging voices in Cultural Heritage: protection through innovation in materials and methods

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Abstract

Among the materials that constitute built heritage, mortars have distinct and essential functions. They can be used as a joining element between stone or masonry blocks, as a fixing material for finishings, as protection in the case of plasters, and they can also be used as decorative elements. Mortars correspond to a mixture between a binding material and aggregates, both inorganic, to which water is added until the desired consistency is achieved. Despite this common basis, the properties of the resulting material may be made to vary to better suit the function for which they are intended. Several factors will influence the mortar's properties, namely the type of raw materials, their quality, the proportion between the components, the

process of preparation and the method of application. When considering a historical monument, mortars found in the present time may correspond to distinct phases of its construction, remodelling, adaptations or even maintenance works, which often include the total or partial replacement of mortars. The Monastery of Santa Maria de Alcobaça portrays eight centuries of history going through all these types of changes. This study aims to define chemical and mineralogical patterns in mortars from this monument according to their different functions, used either as a joining element of blocks and closure of joints, or as a fixation agent of the primitive ceramic floor, both in the current conditions of exposure and storage. To accomplish this, and prioritising nondestructive techniques, a multi-analytical approach was designed, using XRF, XRD, Optical Microscopy, Raman Spectroscopy, and TG-DTA. The results indicate that all mortars are rich in quartz sand and the binder is lime-based, a higher silicon content corresponding to pavement laying and fixing mortars. Furthermore, when considering the elemental composition, it is possible to observe the presence of specific elements in certain sets of samples, resulting from the type of use and its state of conservation, such as lead in pavement samples and chlorine mostly in samples of the façade.

Acknowledgements

We thank FEDER funds through the COMPETE 2020 Programme and National Funds through the Fundação para a Ciência e a Tecnologia under the project ref. UIDB/50025/2020-2023 and, SFRH/BD/145308/2019 (F. Carvalho). Funding from the European Institute of Innovation and Technology (EIT), a body of the European Union, under Horizon 2020, the EU Framework Programme for Research and Innovation, through the RM@Schools4.0 Project (PA 20069) and AMIR-LIH (PA 20114), is acknowledged.

E-MRS
European Materials Research Society

2023 Spring Meeting May 29 | June 2

40th Anniversary

Congress & Exhibition Centre, Strasbourg, France

SYMPOSIUM U

Merging voices in Cultural Heritage: protection through innovation in materials and methods

Symposium Organizers:

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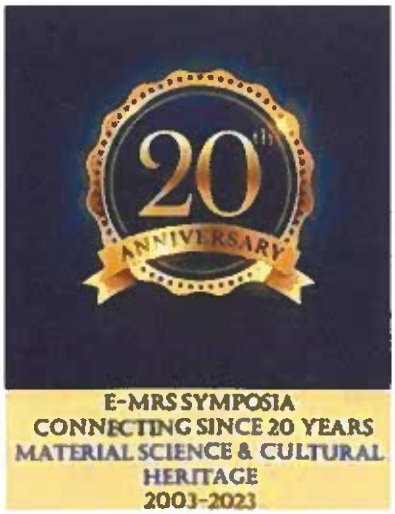

Thursday June 1

U01
Techniques and Methods for a deeper knowledge of CH

Chairperson(s) : PADELETTI Giuseppina

Berlin (Ground floor)

10:15	**2785**	**INV**	Non-invasive (chemical) imaging of works of art – some case studies illustrating current possibilities	**JANSSENS Koen**
10:45	**2100**		Stratigraphy of ancient frescoes: a new approach with photoacoustic and SORS imaging	**PISU Francesca Assunta**
11:00	**1339**		Innovative nano-engineered formulations for the protection of frescoes from microbiological attacks	**MOGLIANETTI Mauro**
11:15	**2339**		Innovative method for provenance study: a new algorithm based on observables from high-resolution Raman spectra	**CHIRIU Daniele**
11:30	**495**		Nanostructured ZnO/CuO based chitosan hydrogel coating for the protection of cultural heritage buildings and sculptures	**BASAK Sayantani**

Thursday June 1

U02
World Heritage Case Studies

Chairperson(s) : BOUQUILLON Anne

Berlin (Ground floor)

13:45	**1687**		Turning tragedy into opportunities: analyzing the fragments of the glass artefacts of the AUB Archeological Museum shattered by the Beirut August 2020 explosion	**TABBAL Malek**
14:00	**1384**		Mortars from the Monastery of Santa Maria de Alcobaça, in Portugal: characteristics and functions	**VEIGA João Pedro**
14:15	**1756**		Preservation of Bush Hammering Granite Ashlars of Casa de Mateus Palace Complex Chapel (Vila Real, Galicia-North Portugal Euroregion)	**LÓPEZ Ana J.**