



5th Historic Mortars Conference

HMC 2019

Book of Abstracts

University of Navarra, Pamplona

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Universidad
de Navarra



5th Historic Mortars Conference (HMC 2019)

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Studies of the mechanical properties of lime mortars treated with alkaline earth hydroxide nanoparticles

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Abstract

In the last decades a special attention has been devoted to the development of nanomaterials for conservation and restoration of Cultural heritage. Nanomaterials exhibit distinct properties when compared to their bulk analogues and have been seen as a good alternative of compatible materials for long-term preservation of monuments and artefacts [1-3]. Our studies have been focused on the elaboration and optimization of preparative strategies of micro- and nanolimes and on the study of their efficiency in the consolidation of lime mortars and lime paintings [4, 5]. In this communication we report the synthesis approaches to prepare calcium and magnesium hydroxides nanoparticles, $\text{Ca}(\text{OH})_2$ and $\text{Mg}(\text{OH})_2$, with chemical precipitation from aqueous solutions. The synthesis is carried out at temperatures range Troom - 90 °C from equal volumes of NaOH and CaCl_2 or MgCl_2 solutions with different concentration. We also report our attempt to achieve a good particles morphology by the addition of surfactants. The possibility of the application of their alcohol dispersions in cultural heritage restoration for consolidation of wall paintings on lime mortar renders is anticipated. We discuss the laboratory tests conducted to assess the efficiency of the nanolimes on lime mortar specimens. Furthermore, we report out preliminary studies of the compatibility of the nanoconsolidants with inorganic pigments which have been used in the preparation of the paint layer of wall paintings.

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Keywords

Nanolime; Nanoconsolidants; Magnesium Hydroxide; Calcium Hydroxide