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Ancient mortars from Cape Verde: mineralogical and physical characterization

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Times and locations of different building constructions means different knowledge, habits, different construction methods and materials. The study and safeguarding of the architectural heritage takes nowadays a progressive importance as a vehicle for transmission of cultures and history of nations. The coatings are of great importance in the durability of a building due to the protective role of the masonry. The compatibility between the materials with which they are executed (masonry, mortar and grout settlement) promotes the proper functioning of the wall and a consequent increase in durability. Therefore, it becomes important to study and characterize the mortar coating of buildings to know its characteristics and to use compatible materials in the rehabilitation and maintenance of buildings. This study aims to characterize the chemical, physical, mechanical and mineralogical mortar samples collected in buildings in three islands of Cape Verde, for the conservation, rehabilitation and preservation of them. The collected samples belong to buildings constructed in the end of XIX century and in the beginning of XX century.

In order to characterize the mortar samples some tests was made, such as X-Ray Diffraction, X- Ray Fluorescence, acid attack and mechanical strength.

The samples were divided into three groups depending on origin; so we have a first group collected on the island of Santiago, the second on the island of Saint Vincent and the third on the island of Santo Antao.

The samples are all carbonated, but Santiago samples have a lower carbonates content. In terms of insoluble residue (from the acid attack) it was concluded that the samples have similar value ranging from 9 to 26%. The compressive strength of the mortars have a range between 1.36 and 4.55 MPa, which is related to the presence of more binder in samples with higher resistance.

The chemical and mineralogical analyzes showed that these consist of lime mortars (binder), natural pozzolan and basaltic sands, which would be expected because these buildings are in a volcanic complex.

The addition of pozzolans mortars confers resistance. It will be important in the conservation and maintenance of these buildings to use mortars with the same constituents of those proposed on this study, for greater durability of the coating of these buildings.

These basic properties provide a basis for the development of adequate interventions, preserving the characteristics of the buildings.