

Extended Abstract

Restoration Materials Compatible with Heritage Wall Paintings [†]

Ileana Mohanu ^{1,*}, Dan Mohanu ², Ioana Gomoiu ³, Roxana-Magdalena Fechet ¹, Adriana Moanță ¹ and Ionela Petre ¹

¹ CEPROCIM SA, 6 Bdv. Preciziei, 062203 Bucharest, Romania; roxana.fechet@ceprocim.ro (R.-M.F.); adriana.moanta@ceprocim.ro (A.M.); ionela.petre@ceprocim.ro (I.P.)

² National Arts University, 19 General Budișteanu, 010773 Bucharest, Romania; dan_ileana_m@yahoo.com

³ Institute of Biology, Romanian Academy, 296 Spl Independentei, 060031 Bucharest, Romania; ioana.gomoiu@ibiol.ro

* Correspondence: ileana.mohanu@ceprocim.ro

[†] Presented at the 15th International Symposium “Priorities of Chemistry for a Sustainable Development” PRIOCHEM, Bucharest, Romania, 30th October–1st November 2019.

Published: 18 October 2019

Keywords: lime-based mortar; hydraulic lime; fresco painting; wooden church; masonry monuments

The conservation-restoration interventions at historical monuments in Romania require materials that respond both to the general requirements set out in the International Charters on the conservation and restoration of heritage, and to the specific conditions of the country: compatibility with the nature and characteristics of the constituent elements of the historical monuments, reversibility, and resistance to environmental factors. Failure to comply with the above principles has favored, in the past, the application in the works of conservation-restoration some inadequate materials, with excessive hardness and impermeability, with negative consequences on the state of preservation of historical monuments. The restoration materials presented in the paper were made on the basis of the information obtained through the physical and chemical characterization using specific investigation techniques (, X-ray diffraction, scanning electron microscopy coupled with energy dispersive X-ray analysis, Fourier transform infrared spectroscopy, chemical analysis) of the mortars taken from historical monuments. The characteristics of the new materials are compared with those of other similar materials used in the restoration work.

The materials based on hydrated lime or hydraulic lime, with and without pozzolana addition have been characterized from a chemical, physical-mechanical, and durability (frost-defrost and crystallization of soluble salts resistance) point of view.

For the materials made, we obtained characteristics that recommend them in the works of conservation-restoration of the mural paintings:

- do not contain the chemical components of cement degradation (tricalcium aluminate, sulphates);
- allow the exchange of humidity, having good water vapor permeability;
- good resistance to thermal variation;
- mechanical resistance compatible with the original;
- good resistance to biodeterioration.

The materials made were tested on support-models (reproducing the original techniques) and experimentally in situ, on different masonry or wood monuments. Materials containing hydraulic lime or pozzolana addition play a special role in restoration because they allow the execution of work

on monuments located under severe microclimate conditions (permanent excessive humidity or large variations in temperature and humidity).

Acknowledgments: The authors acknowledge the financial support received from the MCI-Plan Sectorial, contract 5PS/05.09.2019.



© 2019 by the authors. Licensee MDPI, Basel, Switzerland. This article is an open access article distributed under the terms and conditions of the Creative Commons Attribution (CC BY) license (<http://creativecommons.org/licenses/by/4.0/>).