

X-RAY STUDY OF SO₂ DRY DEPOSITION EFFECT ON MONUMENTAL BUILDING STONES

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The main atmospheric pollutant affecting building materials is primarily SO₂ which is very reactive, corrosive and acidifies rain. The aims of this research were to evaluate the durability of a porous monumental limestone (Repedea - Romania) treated with siloxane-based worldwide used water repellent products (Lotexan-N, Silres BS 290 and Tegosivin HL 100), against the environmental conditions the stone monuments may be surrounded by and to find, characterize and propose new, improved chemical recipes (newly synthesized hybrid nanocomposite with silsesquioxane units named TMSPMA) to be used as an alternative to the commercially available ones.

X-ray diffraction patterns and ESEM measurements of Repedea samples subjected to SO₂ dry deposition illustrate the presence of hanebachite on untreated Repedea, as well as on the ones treated with all compounds.

Only Tegosivin and TMSPMA assured a smaller degree of sulphation and a higher resistance to SO₂ action, process evidenced by the smaller crust thickness as compared to the one obtained in case of untreated Repedea.