

Earth Sciences Department

NATURAL STONE ALTERATION

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CEVALOR
CENTRO TECNOLÓGICO DE PEDRA NATURAL DE PORTUGAL

LNEG



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Petrology and Geochemistry)

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Objectives

Studies in Mineralogy, Petrology (1) and Geochemistry.

Experimental alteration of igneous and metamorphic rocks in order to determine their use as natural stone.

Tests of laboratorial alteration of rocks simulating polluted atmospheres, acid rains, pollutant particles and saline atmospheres.

Studies of alteration of rocks applied in the recent and ancient built heritage (2).

The use of geo-materials (3) in the production of information systems for support to teaching and dissemination of the Earth Sciences.

Methodology

The experiments included a series of tests of alteration in laboratory: tests with salt fog spray chamber (4), test of rock percolation with water using Soxhlet extractor, rock alteration with acid solutions (HCl, HNO₃, H₂SO₄), simulating acid rains, in hand sample and thin section, tests with cycles of temperature and moisture, freeze thaw cycles, etc.

The rocks that have been studied included several lithological types of Portuguese and Brazilian silicate dimension stones (granites, syenites, gabbros, basalt, etc), Portuguese ornamental marbles and limestones, rocks with water repellent and consolidant covers, engineered artificial stones and ceramic materials.

Expected Results

This works show the importance of testing and characterization of rocks and the results have been obtained through studies of optical observations with polarized and electronic microscopy (5), chemical mobility using several techniques of analysis, determination of the variation of some physical and mechanical properties.

The tests allowed to detect chemical and mineralogical and petrographic modifications in the rocks and evaluate the extension of the alterations.

Funding:

