

**CORROSIVE OF CALCAREOUS STONES, WITH HISTORICAL VALUE,
FROM NITROGEN OXIDE AND NITROGEN DIOXIDE**

Ph. KIRKITSOS¹, V. G. BIKAS², D. SIKIOTIS³

*Dr. Environmentalist, 18b Themistochleus Str. Marousi, 15122
Environmentalist, MSc Oceanographer 13 Galinis Str., N. Iraklio, 14122
Chemistc, MSc Environmentalist, Stayros Ithaki*

ABSTRACT

The effects of gaseous nitric acid (HNO_3) and nitrogen dioxide (NO_2) on three calcareous stones (Pentelic marble, Portland limestone and Baumberger sandstone), used extensively in historic buildings, have been investigated under different conditions of relative humidity, mass of stone, nitric acid concentration, grain size of stone and flow rate of gas mixture. It was found that all three stones are good sinks for gaseous nitric acid. An expression has been derived enabling the comparison of the vulnerability of each stone to NO_2 and gaseous HNO_3 . Using this expression it has been estimated that in Athens gaseous HNO_3 is more corrosive than NO_2 for marble monuments, in spite of its presence at appreciably lower concentrations. NO_2 , on the other hand, is more corrosive than gaseous HNO_3 for Portland limestone and Baumberger sandstone in cities such as Athens.