Group of Environmental and Cultural Heritage Chemistry

Dept. of Industrial Chemistry and Materials – UniBO

Prof. Luciano Morselli, Dr. Elena Bernardi
This group studies the interaction between Environment and Cultural Heritage in order to contribute to:

• the comprehension of the mechanisms of decay
• the development of suitable protection strategies
### Alma HeritageScience
**Integrated Research Team**

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- Environmental Monitoring: monitoring of meteoclimatic parameters, sampling and analysis of particulate matter, wet & dry atmospheric depositions, atmospheric pollutants (indoor and outdoor), water, soil, ...
  - knowledge of the environment surrounding Cultural Heritage

- Natural or artificial ageing of different materials and protective products
  - knowledge of the decay induced by different environmental conditions or pollutants
  - optimization of materials and protective treatments depending on the environmental conditions

- Chemometric analysis
  - correlation between environmental and cultural heritage data

- Critical Loads calculation
  - evaluation of the sensitivity of the ecosystems to acidification, eutrophication, metal depositions.
Main Analytical Techniques:
• Atomic Absorption Spectrometry (AAS)
• Inductively Coupled Plasma (ICP) Spectrometry
• Ionic Chromatography (IC)
• High-Performance Liquid Chromatography (HPLC)
• Gas Chromatography-Mass Spectrometry (GC-MS)

Accelerated artificial ageing:
• Alternated immersions
• Rainfall simulation
Some Case Studies

Analysis of damage layers in modern concrete buildings
In collaboration with:
• CNR Institute of Atmospheric Sciences and Climate (CNR-ISAC)

Corrosion of outdoor bronzes
In collaboration with:
• Dept. Metal Science, Electrochemistry and Chemical Techniques, UniBO
• Dept. Physical & Inorganic Chemistry, UniBO
• Université de Toulouse, CNRS, UMR 5608 TRACES (F)

Effects of bird dropping on copper and bronze
In collaboration with:
• School of Environmental Sciences, University of East Anglia, Norwich (UK)

Effects of NO\textsubscript{x} on the Lecce stone and evaluation of the efficiency of different protective products
In collaboration with:
• CNR Institute for the Conservation and Enhancement of Cultural Heritage (CNR-ICVBC)
Main publications in CH field

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