

Materials Science Department

X-Rays for Materials Characterization

CENIMAT-I3N / Structural Materials Group



João Pedro Veiga

Assistant Professor

2006 – Ph.D. in
Crystal Chemistry
(Structural Analysis)

Objectives

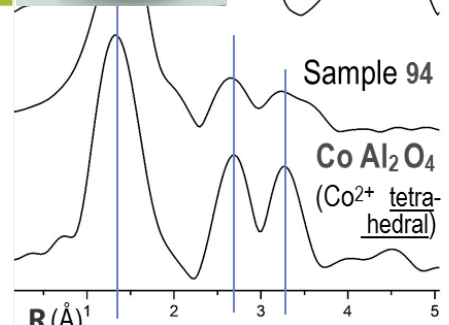
- Valence plus bonding state of chromophore ions (iron, copper, cobalt) in natural painting pigments and in ancient glazes (Portuguese tiles and faïences, Chinese porcelains).
- Binding state of strategic metals - particularly, indium - in sulphide ores and oxides; Scarce elements (Se, Re).
- Coordination of hazardous metals in sulphates from acid mine drainage.
- Theoretical interpretation of peculiarities observed in XANES spectra from sulphur (K-edge) and indium (L_3 -edge).

Methodology

- X Ray Fluorescence
- X Ray Diffraction
- X Ray Absorption Near Edge Spectroscopy (XANES)
- Extended X-Ray Absorption Fine Structure (EXAFS)
- Synchrotron Radiation

Expected Results

- Understanding materials from the past – strategies for cultural heritage preservation.
- Nanomaterials for the protection of public art.
- Development of glasses with added value properties using nanoparticles.
- Strategies for recycling of rare-earth elements in mining residues.



Funding: