

# Internships 2013

## Green marbles degradation: Raman mapping of serpentines structures

Green marbles are commonly used as ornamental stones on building heritage. These are serpentinites and are sensitive to the degradation. The understanding of the degradation mechanisms needs to know better the importance of the intrinsic factors such as their constitutive minerals that can be involved in them. These minerals are members of the serpentine family.

Serpentinites generally come from ultrabasic rocks such as peridotites, pyroxenites or dunites. They are constituted of a large variety of microstructures including chrysotile, lizardite or polygonal serpentines (antigorite, protoseppentine...). In another hand, lots of pseudomorphic textures are associated to these microstructures. Photonic microscopy is only able to differentiate the textures and TEM allows identifying microstructures types. But it is difficult to understand the relationships between microstructures of serpentines and textures because of the gap in scales ( $\mu\text{m}$  to  $\text{nm}$ ).

Therefore an intermediary characterization technique such as Raman spectroscopy is needed. Rinaudo *et al* (2003) and Groppo *et al* (2006) have shown its capacity to identify the different microstructures without any doubt at a micrometric scale. Raman spectroscopy is also able to map them on thin sections.

The study will be based on photonic microscopy, transmitted electronic microscopy, and Raman spectroscopy analyses on thin sections.

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