Geophysical Research Abstracts, Vol. 7, 02344, 2005
SRef-ID: 1607-7962/gra/EGU05-A-02344

Characterization of serpentinites to define their appropriate use as building stones.

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Many questions arise when considering the appropriate use of building stones such as serpentinites. The commercial names of these rocks, collectively grouped as “Green Marble”, have no correspondence to their actual mineralogy, geochemistry and/or physical characteristics, serpentinite being the hydrated product of an ultramafic parent rock and not a metamorphic product of limestone as implied by the term ‘marble’. However, the serpentinites most widely used for ornamental purposes come from India (e.g. Rajasthan Green, Emerald Green) and in these the original mineralogy has been almost completely converted into carbonates. By contrast, serpentinites from elsewhere (e.g. Vermont Verde Antique from the USA and Verde Pirineo from Spain) do preserve some of their original mineralogy. The different physical and chemical behaviour of carbonates and serpentine minerals can result in significantly different behaviour of the commercial building stones. Thus carbonates are resistant to weathering but suffer from acidic cleaning agents in interior use whereas serpentinites with a high content of talc used on external faces undergo an increase in volume and a consequent rapid degradation.

Accurate and precise characterization of serpentinites, including information on their mineralogy and geochemistry (including major, trace and volatile elements together with oxygen isotopes), in conjunction with their physical properties, would enable

architects to select the appropriate interior or exterior use of these handsome building stones.