

**FROM MICROINCLUSIONS TO MAPPING AND MOBILITY (1983-2005):
AN OVERVIEW OF RAMAN MICROSCOPY APPLIED TO ECLOGITES**

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Raman Microscopy (RM) applied to eclogites seems to have begun in 1983 with the need to clarify the identity of two-phase SiO₂ microinclusions discovered in eclogite-facies rocks in Italy and Norway (BOYER et al., 1985a). This example has become a classic method in UHPM studies as it combined several beneficial possibilities of RM: (1) non-destructive physico-chemical analysis; (2) no special sample preparation; (3) analysis under the surface of transparent media; (4) analysis of a ~1 μm³ volume; and (5) distinction of polymorphs (SMITH & CARABATOS-NEDELEC, 2001, NASDALA et al., 2004). After the original work on coesite / quartz, RM became widely used in many countries to distinguish between calcite / aragonite, sanidine / orthoclase / microcline & graphite / diamond / lonsdaleite / ??? and to study order / disorder phenomena in eclogite-facies rocks. A short time after it was applied to identifying run products in experimental petrology on UHPM minerals, e.g. AlF-rich titanite (BOYER et al., 1985b). Since RM can also analyse liquids and gases, it has been used to determine fluid inclusions (especially gases) in eclogites. Raman shifts can be caused by chemical exchanges that, when calibrated, can lead to semi-quantitative analysis of, for example, the jadeite % in omphacite or the pyrope % in hexary garnet (SMITH & PINET, 1989). More recently Raman mapping has shown its power to image phase distinctions and phase transformations, as well as elemental chemistry, in Norwegian symplectite, in zoned Guatemalan jadeite, and in metamictised zircon and complex carbon intergrowths from Kazakhstan (e.g. SMITH, 2004). Since 1999 Mobile RM (MRM) has been applied to analysing archaeological artefacts *in situ*, but this was not of great interest to eclogites. However the new possibility of "hand-held" analysis with a battery-powered mini-RM has led to "ultra-MRM" of Rock Art inside caves (SMITH, 2005); this means that it is now possible to distinguish the Jd % or Pyr % of eclogite minerals *in situ* in the field.

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