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Aragonite: crystallographically oriented inclusions in blueschist/eclogite-facies garnet from Corsica

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Aragonite, the high-pressure polymorph of calcite, occurs as a metamorphic index mineral in the lowest-grade low-temperature, high-pressure metamorphic terranes, e.g. the Franciscan formation in California, or western Crete in Greece. The rapid kinetics of its back-reaction to calcite upon decompression makes its preservation an indicator of decompression under quite low temperatures, implying either anti-clockwise P-T paths or at least continuous cooling during decompression [1, 2]. There are indeed extremely few records of aragonite relics in relatively high-grade rocks, then as tiny inclusions in a rigid host mineral, garnet [3], which prevents expansion and transformation of the high-pressure carbonate polymorph, in the same way as it does for coesite or microdiamond.

We record here the occurrence and preservation of aragonite in eclogitic blueschists of eastern Corsica, showing a most uncommon microtexture. Aragonite exclusively (?) occurs as oriented rods in garnet crystals of a black calcite marble that immediately overlies serpentinite bodies of the meta-ophiolitic unit. The crystallographic control imparts to the garnet the appearance of a sector zoning, and the whole texture is very reminiscent of the crystallographically oriented intergrowths of either quartz or organic material ('graphite') already described in garnet of a few amphibolite-facies metamorphic terranes (Ireland, Norway, [4-6]). These observations and their significance will be discussed in the light of a detailed petrological description of these rocks, Raman imaging of the calcite/aragonite polymorphs in the sections and of Raman investigation of the abundant carbonaceous material of the samples. The bearing on the significance of other crystallographically oriented inclusions in (high-pressure?) garnet will be envisaged as well.

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