THE DIFFERENT P-T HISTORIES RECORDED BY HP BLOCKS IN A TECTONIC MELANGE (LIGURIAN ALPS - NW ITALY): IMPLICATIONS FOR SUBDUCTION AND EXHUMATION PROCESSES

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The Voltri meta-ophiolitic massif is located at the southern end of the Western Alps: it records subduction-related high-pressure metamorphism followed by exhumation to crustal environments with greenschist-facies retrogression.

We present a structural and petrologic analysis of a tectonic mélange in the north-western sector of the Voltri massif. In the mélange, a foliated chlorite-actinolite greenschist matrix encloses decametre-scale lenses of metabasites and metasediments. The mélange zone is hosted by country serpentinites which do not enclose such a variety of HP rocks. All lenses well preserve the dynamic structures and the mineral assemblages formed during stages of HP metamorphism. Moreover, they are characterized by internal high-pressure foliations discordant respect to the greenschist foliation of the surrounding matrix. The lenses display foliated chlorite-actinolite rinds, the orientation of which parallels the main matrix foliation. The mafic lenses in the mélange zone equilibrated over a wide range of peak metamorphic conditions: peak assemblages range from eclogite- to blueschist-facies. Some blocks record the prograde transition from lawsonite-bearing assemblages to epidote + omphacite + garnet eclogites. Omphacite-garnet foliations in the eclogites are overprinted by the multiple growth of syn-tectonic garnet- and epidote-blueschist assemblages. The blueschist lenses display peak syn-tectonic garnet-blueschist assemblage overgrown by epidote-blueschist ones. A late stage greenschist-facies re-equilibration heterogeneously affects the HP lenses and is particularly widespread at their rims. On the other hand, the surrounding chlorite-actinolite matrix does not contain relics of HP assemblages.

The HP lenses sampled by this mélange zone thus record different segments of subduction-related P-T paths. This suggests that the HP blocks were sampled by deformation horizons in a dynamic regime active during the entire peak and exhumation history. Even if development of the present-day mélange zone clearly post-dates the HP events recorded inside the lenses, the mélange shear zone likely reactivated older structures incorporating blocks from different tectonic levels. Tectonic mechanisms responsible for the mélange formation are therefore discussed in the framework of the subduction and exhumation processes.