

**ECLOGITE-FACIES TRANSFORMATIONS OF ZERMATT-SAAS
OPHIOLITIC GABBRO AND TROCTOLITE (CREPIN, VALTOURNANCHE,
ITALIAN WESTERN ALPS)**

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Metagabbro and meta-troctolite from the Zermatt-Saas unit of the western Alps are coronitic rocks showing variable degrees of metamorphic transformation from igneous protoliths (plagioclase, olivine, Ca-clinopyroxene and spinel rocks) to completely eclogitized rocks.

Major and trace element analyses, a throughout study of microstructures and thermodynamic modelling of equilibrium assemblages have been performed, in order to unravel the metamorphic evolution of these metabasites and the mechanisms regulating the development and preservation of the high-pressure assemblages.

Evidence has been found that in completely transformed troctolite, fine-grained jadeitic clinopyroxene and clinozoisite replaced igneous plagioclase. Small kyanite crystals, together with micas (phengite and paragonite), chloritoid and garnet, forming irregular coronas at the former plagioclase-olivine interface, have been found towards olivine microdomain. Olivine was mainly transformed to talc. Large tremolite crystals are also common, together with omphacite, phengite, chloritoid, chlorite, kyanite and even rare quartz. Cr-rich clinopyroxene was partially to completely overgrown by omphacite. The latter is here and there overgrown by Cr-rich chloritoid and talc. In incompletely eclogitized rocks, igneous mineral relics are rimmed by eclogite-facies complex coronas consisting of talc + clinopyroxene + chlorite + garnet between olivine and plagioclase, and of omphacite when grown between clinopyroxene and plagioclase.

The variable degree of development of eclogite-facies reactions appears to be related with the intensity of the oceanic alteration that took place before eclogitization. This conclusion is in agreement with the fact that the oceanic metamorphism leads mainly to the development of low-grade hydrous assemblages, which presumably favoured here the chemical homogenization of the igneous microdomains and enhanced the kinetics of subsequent eclogite-facies metamorphic reactions. Computations of P-T pseudosections for the various microdomains of these rocks have provided P-T estimates of $P > 2.0$ GPa and $T \approx 600$ °C for the eclogite-facies reequilibration.