COMPARATIVE PETROLOGY OF THE MANTLE-CRUST TRANSITION ZONE: EXAMPLES FROM THE WESTERN ALPS AND THE ATLANTIC RIDGE.

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The mantle-crust transition zone of the oceanic lithosphere is one of the most active part of the oceanic accretion system not only in terms of magmatic accumulation, impregnation, percolation, and subsequent chemical interactions, but also in terms of geodynamic processes.

A way to get a better understanding of such phenomena is a comparative approach between present-day oceanic lithosphere materials and their fossil equivalents from alpine ophiolitic successions.

Mantle tectonites and ultrabasic to basic plutonic rocks coming from the equatorial Atlantic Vema and Romanche fracture zones and from the liguro-piémontais Montgenèvre ophiolitic complex (MOC) are involved in this study, both environments being considered as slow rate accretion system expressions.

The MOC is largely preserved from the alpine metamorphic effects. This allows a significant comparison to precise how the mantle-crust transition zone, in such a highly dynamic geotectonic context, acquires its petrological features.
From both types of localities, mantle tectonites, impregnated or not, members of a strongly differenciated cumulate gabbroic sequence, such as troctolites, cpx-gabbros, Fe-Ti gabbros, are implied.

The main primary mineral phases, often as relics only, are spinel, olivine, orthopyroxene and clinopyroxene, plagioclase, Fe-Ti oxides. The most significant secondary minerals consist of serpentinite minerals, a suite of amphiboles mainly developed after pyroxenes, and plagioclase.

Petrographical and geochemical (major and trace elements) aspects are presented. The chemical interactions between the ascending mantle extracted magmas and previously crystallized rocks, as well as the textural features of the concerned lithologies, are discussed.

We also make the demonstration of numerous analogies in terms of primary mineral assemblages, textural characteristics, and development mode of secondary paragenesis.

All the collected data supply evidences on the timing of the recrystallizations and deformations suffered by those rocks. The discrimination between the respective contributions of both oceanic and alpine orogenic metamorphisms is significantly improved.