

THE ULTRAMAFIC BODY OF NAUDERS – PART OF THE DEEPER MANTLE OF THE TASNA OCEAN-CONTINENT-TRANSITION

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Ultramafic complexes of Mesozoic within the Penninic Windows of the Eastern Alps mostly are related to ophiolitic fragments representing former oceanic crust. All of these mantle fragments are highly serpentized and show in the Eastern Alps harzburgitic composition. Only few exceptions are composed of rather undepleted Iherzolitic rocks. (e.g. in the zone of Mauter south of the Tauern window and in the north in the Lower Austroalpine Reckner complex). Another Iherzolite complex occurs SW Nauders and is located between greenschists and sediments to the north, both related to the North Penninic zone of Pfunds, and continental rocks of the Middle Penninic Tasna nappe to the south, indicating a Middle Penninic position as is demonstrated by geological mapping (BERTLE, 2004). Locally, small gabbroic intrusions and synfoliation pyroxenitic layers and more rarely with preserved volcanic texture are connected to the Iherzolites. The coarse-grained Iherzolite of Nauders carries a well-preserved primary assemblage of olivine ($Fo_{0.90}$), clinopyroxene ($X_{Mg} = 0.90$ to 0.91 , with up to 2 wt% Na_2O and 6–7 wt% Al_2O_3), orthopyroxene ($En_{0.89-0.90}$, with 0.4–0.6 wt% CaO and 4–5 wt% Al_2O_3) and a green spinel (with a $Cr\# = 0.065$ and a $X_{Mg} = 0.796$). This assemblage is partly replaced by pure diopside (rimming clinopyroxene), minor amphibole (Na- and Ti-rich pargasite), serpentine and carbonate as well as brown spinel. Chondrite-normalized REE patterns of the ultramafic rock of Nauders are rather flat with slightly depleted LREE (MELCHER et al., 2002), similar to other Iherzolitic samples of the Mesozoic units. Small gabbroic bodies and rare cross-cutting basaltic dikes are associated with the ultramafic rocks. Based on their less mobile trace element (HFSE) geochemistry, they more likely represent within-plate magmas than typical mid-ocean ridge basalts. Based on the differences in preservation and geological setting, and in the geochemical composition of associated mafic rocks the ultramafic complex of Nauders might better correspond to tectonic setting such as, e.g. the Valmalenco complex (MÜNTENER et al., 2000, MANATSCHAL et al., 2006), which is currently interpreted as a fragment of a pre-oceanic subcontinental mantle of the Briançonnais microplate, emplaced and denuded during late Jurassic to early Cretaceous time (BERTLE, 2004).