

PETROLOGICAL AND STRUCTURAL CHARACTERISTICS OF THE AUSTRO-ALPINE HIGH PRESSURE BELT IN THE SOUTHERN ÖTZTAL ALPS, TYROL

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The investigated area is located in the southern Ötztal Alps at the transition from the Ötztal Complex (ÖC) in the north, part of the Ötztal-Bundschuh Nappe System and the Texel Complex (TC) in the south, part of the Koralpe-Wölz high pressure nappe system (SCHMID et al., 2004). Both reflect a polymetamorphic evolution which is documented by discontinuous chemical zonation of garnets due to a pre-Alpine core overgrown by an eo-Alpine rim. The metamorphic pattern of the southern Ötztal Alps is characterized by a continuously increasing eo-Alpine metamorphic grade towards the south from greenschist-amphibolite transition facies (ÖC) to eclogite facies (TC). The pre-Alpine imprint in this area is different: a high P/T Variscan in the ÖC and a Variscan and/or low P/T Permian in the TC (SCHUSTER & STÜWE, 2008).

It is generally accepted to classify the ÖC and TC as different tectonic units (SCHMID et al., 2004; SÖLVA et al., 2005) probably because of the occurrence of eclogites in the TC in contrast to the ÖC but by ignoring the metamorphic field gradient and the typical large scale structure characterized by vertical fold axes ("Schlingentektonik"). This large scale structure is well documented in the geological map of SCHMIDEGG (1932) showing that distinct lithologies can be traced from the TC into the ÖC.

This work is a petrological approach using garnet zoning patterns, geothermobarometry based on pseudo-sections and EMPA-monzite-dating to distinguish between lithologies of the TC and the ÖC by considering their different metamorphic history. Applying these methods to a distinct micaschist layer in the ÖC which continues into the TC, results in garnet zoning patterns typical for the TC. Additionally PT-conditions for garnet core formation show significant differences between the micaschist layer (ca. 6-7kbar) and the surrounding ÖC (8-9kbar). This is interpreted as hint for Permian vs. Variscan garnet core formation in the micaschist layer and the ÖC respectively. Moreover monazite of the ÖC is clearly of Variscan age but in the micaschist layer Permian additionally to Variscan ages were measured.

We conclude that lithologies of different metamorphic history are tectonically interlayered in the southern ÖC which probably belong to the eo-Alpine HP wedge (TC). This mingling of parts of the wedge enclosed within the upper plate (ÖC) result from SE-directed subduction and subsequent exhumation of the TC below the ÖC.

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