

GARNET ZONING AND GARNET ISOPLETH GEOTHERMOBAROMETRY AT THE TRANSITION BETWEEN THE ÖTZTAL-BUNDSCHUH NAPPE SYSTEM AND THE KORALPE-WÖLZ HIGH-PRESSURE NAPPE SYSTEM WEST OF THE TAUERN WINDOW

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The transition between the Ötztal Complex as part of the Ötztal-Bundschuh Nappe System and the Schneebergzug and Texel Complex, both are parts of the Koralmpe-Wölz High Pressure Nappe System, is intensely folded which hampers a clear separation between this units. Based on earlier geological maps rocks of the southern located Texel Complex as part of the Koralmpe-Wölz High-Pressure Nappe System appear incorporated into units of the Ötztal-Bundschuh Nappe System. The aim of this study is to clarify this approach by the aid of a NW-SE profile using garnet major element zoning linked with garnet isopleth geothermobarometry. “Jumps” in element distribution of major elements are linked with metamorphic events, like Variscan (MP/MT) in the Ötztal Complex, Permian (LP/HT) in the Texel Complex and eo-Alpine (HP/MT) in both complexes

Two main types of pre-*eo*-Alpine garnet zoning patterns in the cores, type-1 and type-2 and two main types of *eo*-Alpine garnet zoning in the rims, type-3 and type-4 have been observed. Type-1 shows typical prograde zoning with decreasing X_{Grs} (Grs_{30} to Grs_8) and bell-shaped X_{SpS} patterns, as well as increasing X_{Alm} (Alm_{60} to Alm_{70}) and X_{Prp} (Prp_5 to Prp_{12}) from the inner core close to the rim. Type-2 is characterized by homogeneous contents of X_{Grs} (Grs_{8-10}), X_{Alm} (Alm_{70-75}), X_{Prp} (Prp_{10-15}) from the inner core to the outer core. The rims of the porphyroblasts show two different garnet zoning types with significantly higher X_{Grs} and can be distinguished into: type-3 with a small jump in X_{Grs} (from Grs_{10} to Grs_{25}), in X_{Alm} (Alm_{75} to Alm_{60}) and in X_{Prp} (Prp_{15} to Prp_{10}) and type-4 with a higher jump in X_{Grs} (from Grs_{10} to Grs_{30}), in X_{Alm} (from Alm_{75} to Alm_{55}) and in X_{Prp} (from Prp_{15} to Prp_5). Type-4 comprises a large garnet volume with a continuous decrease in X_{Grs} (Grs_{30} to Grs_{20}) and a continuous increase in X_{Alm} (Alm_{55} to Alm_{65}), and in X_{Prp} (Prp_5 to Prp_{10}) towards the outermost rims.

To estimate the P-T conditions of pre-*eo*-Alpine garnet growth, grossular-, almandine- and spessartine isopleths were calculated with the program PERPLEX. The intersections of the isopleths yield 0.7-0.9 GPa and 550-650 °C for the pre-*eo*-Alpine type-1 core and type-2 core garnets and 0.8-0.9 GPa with 550-600 °C for the *eo*-Alpine type-3 and type-4 garnet rims. It can be concluded that based on garnet thermobarometry and major element zonation it is more likely that rocks directly exposed north of the Schneebergzug experienced a Variscan than a Permian event, followed by an *eo*-Alpine metamorphic overprint.