

PETROLOGY OF ECLOGITES AND ASSOCIATED GNEISSES OF THE POLINIK STRUCTURAL COMPLEX (KREUZECK MOUNTAINS, EASTERN ALPS)

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The region of the Kreuzeck Mountains southeast of the Tauern Window in the Austrian Eastern Alps reveals contrasting early-Cretaceous overprint of the Austro-Alpine (AA) basement complexes from (sub-) greenschist to high-pressure (HP) amphibolite/eclogite facies (HOKE, 1990; PUTIŠ et al., 2002; MICHÁLEK et al., 2001; KONZETT et al., 2011). The HP amphibolites to eclogites and the host kyanite-garnet paragneisses and granitic orthogneisses form tectonic lenses of the AA Polinik structural complex along a dextral strike slip shear zone. The eclogites/HP amphibolites and Grt-Ky-St micaschists of the AA Polinik structural complex form tectonic lenses within the MP kyanite-garnet para- and orthogneisses and amphibolites, sporadically containing thin layers of marble and calc-silicate rocks.

The eclogite mineral assemblage is represented by garnet, omphacite, zoisite, amphibole and rutile (M1 stage). $\text{Cpx}_1(\text{Jd}_{25-45}) - \text{Grt}(\text{Alm}_{53-50}\text{Prp}_{19-23}\text{GrS}_{29-34})$ pairs were used to obtain temperatures of 600-720 °C at minimum estimated pressures of 1.1-1.7 GPa based on the Jd content found in Omp. Using PERPLE_X (CONNOLLY, 2005), the calculated pseudosection yields peak metamorphic conditions of 630 – 730 °C at 1.4 – 1,7 GPa. Omp (Jd_{25-45}) is decomposed into symplectite of $\text{Cpx}_2(\text{Jd}_{19-8})$ and Pl (An_{14-26}) during the M2 exhumation stage at a temperature of c. 700 – 650 °C and 1.4 – 1.0 GPa. Subsequent retrogression caused corona textures around garnet consisting of Am (Prg – Al-Fe Prg) and Pl (An_{34-52}), which indicate the M3 stage of metamorphism. Rt is overgrown by Ilm-Ttn as a result of decompression.

The hosting Grt-Ky-St gneisses are composed of Grt, St, Bt, Ms, Pl, Ky, ±Tur and mostly reflects the retrograde conditions of the M2 stage of metamorphism. A temperature of 650 ± 30 °C at 0.9 ± 0.1 GPa can be calculated by using the Grt-Bt, GRAIL and GASP geothermobarometers. A temperature of 665 ± 15 °C at 0.8 ± 0.08 GPa has been calculated by PT average mode in THERMOCALC 3.31 (HOLLAND & POWELL, 1998) which is comparable to results from Grt-Bt, GASP and GRAIL geothermobarometry.

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