

**A COMPILATION OF THERMOBAROMETRIC DATA FROM
THE CRYSTALLINE BASEMENT WEST OF THE TAUERN WINDOW
(ÖTZTAL-SCHNEEBERG-COMPLEX)**

by

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The Ötztal Stubai basement complex (ÖSBC) and the Schneeberger Zug (SC) are large crystalline complexes, west of the Tauern Window. The Paleozoic SC consists of at least three narrow and structurally complicated synclines folded into the southern part of the polymetamorphic ÖSCB. Petrological as well as geochronological data indicate at least three periods of metamorphism in the ÖSCB: First, a Caledonian event (490 - 420 Ma) resulting in the local formation of migmatites, second a dominant Variscan amphibolite facies event (390 - 270 Ma) and the Eo-Alpine event from 90 to 65 Ma. The degree of the Eo-Alpine metamorphic overprint increases from greenschist facies conditions in the NW to eclogite facies conditions in the SE of the ÖSCB (HOINKES et al., 1991). Thermobarometric data of the Variscan- and Eo-Alpine metamorphic overprint in the ÖSCB and SC were obtained by investigating a wide range of samples from areas where Alpine metamorphism is almost lacking in the NW, to the SE where the dominant Eo-Alpine metamorphic overprint occurs.

The investigated metapelites contain the assemblage garnet + staurolite + biotite + muscovite + plagioclase ± kyanite ± sillimanite ± andalusite and were used to reconstruct pressure and temperature conditions with multi-equilibrium methods. Phase equilibria in the system Na₂O-CaO-MgO-Al₂O₃-SiO₂-H₂O (NCMASH) were calculated using the internally consistent data set of HOLLAND & POWELL (1998) and the program THERMOCALC v. 2.7. To avoid uncertainties due to poor knowledge of H₂O activity, in a first attempt only H₂O-absent reactions are taken into account to calculate an H₂O-absent invariant point. These conditions are used subsequently to estimate $a(\text{H}_2\text{O})$ by calculating P- $a(\text{H}_2\text{O})$ diagrams.

In addition to the multi-equilibrium approach, the inverse approach of GORDON (1992) was also applied to all samples. Instead of using a set of independent equilibria, P and T estimates are found by finding the best-fit hyperplane to the partial molar free energies of all phase components (GORDON, 1992). The program WEBINVEQ uses the data base of BERMAN (1988) with subsequent modifications (BERMAN, 1992, written com.).

The obtained P-T conditions of 470 - 710°C and 4 - 8 kbar were derived for the Variscan event in the ÖSCB and 500 - 600°C and 8 - 11 kbar were obtained for the EoAlpine event in the southern part of the ÖSCB and the SC. Textural and chemical data clearly indicate a continuous pre-Alpine metamorphic evolution.

References

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