

RELATIVE CHRONOLOGY AND ABSOLUTE AGE DATING OF STRUCTURES RELATED TO THE EXHUMATION OF HP-ROCKS IN THE SE ÖTZTAL BASEMENT

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The polymetamorphic basement rocks of the SE Ötztal complex have been overprinted by a HP-metamorphic event in the Cretaceous. Outcrops of eclogite-facies metabasites have been found in a narrow zone to the W of the Passeier valley (HOINKES et al. 1991). Mineral isogrades in the whole Ötztal basement indicate increasing eo-Alpine metamorphic conditions from sub-greenschist facies in the NW to amphibolite facies in the SE (PURTSCHELLER et al. 1987).

Together with eclogite-facies rocks in the Schober- and Kreuzeck Gruppe and the Sau- and Koralm units, these occurrences are regarded as part of the “eo-Alpine high pressure belt” (THÖNI & JAGOUTZ 1993).

The eclogites in the Saltaus valley form boudins of various scales within ortho- and paragneisses. Structural and geochronological investigations were performed in order to clarify the Alpine tectonic evolution of the metabasites and their acidic host rocks.

The main results of these new field and geochronological work are as follows:

The structures observed in the eo-Alpine eclogite facies metabasites and their acidic host rocks have been identified as related to exhumation and emplacement of the HP-rocks. This process can be described as polyphase but continuous, recording decreasing metamorphic conditions within a different kinematic frame.

The first penetrative deformation forms a mylonitic foliation with an E-W trending mineral lineation. Rb-Sr dating of white mica from mylonitic orthogneisses, which show dynamic recrystallisation during this deformation, gave ages around 90 Ma.

The mylonitic foliation is deformed by large-scale, S-vergent folds with plagioclase recrystallizing in fold hinges, indicating T-conditions above 500°C for this deformation.

Two subsequent ductile deformation phases acted under greenschist facies conditions, recording minor tectonic events in shallower levels.

Brittle faulting related to Tertiary movements along the Passeier and Jaufen Linie (MÜLLER 1998) is documented by N-S trending faults, often associated with pseudotachylites and ultracataclasites, but also low-T quartz-ultramylonites. This deformation is accompanied by the intrusion of an andesitic dyke. Biotite and garnet from this magmatic body have been dated by Rb-Sr and Sm-Nd methods, respectively. Mineral ages around 33 Ma are well in line with data for the Periadriatic magmatism along the Alpine chain.

References

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