

## THE TIMING OF PRE-ALPINE HIGH-PRESSURE METAMORPHISM IN THE EASTERN ALPS: CONSTRAINTS FROM U-PB SHRIMP DATING OF ECLOGITE ZIRCONS FROM THE AUSTRO-ALPINE SILVRETTA NAPPE

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Partly retrogressed eclogites of MORB-origin are present in the Austroalpine Silvretta Nappe as lenses and pods within amphibolite-facies orthogneisses. The eclogite assemblage comprises omphacite + garnet + phengite + kyanite + barroisite + rutile + quartz. PT conditions derived from garnet, omphacite and phengite geothermobarometry yielded at 2.8 GPa (500°) according to SCHWEINEHAGE & MASSONNE (1999).

Zircons were separated from a quartz-rich domain containing the typical eclogite assemblage. The zircons are euhedral in shape and may contain inclusions of quartz, rutile, omphacite and barroisite, indicating at least partial growth during the HP-event. All analyzed zircons show complex cathodoluminescence (CL) patterns including irregularly shaped cores with low CL-intensity, oscillatory sector zoning and overgrowths with high CL-intensity. Zircon ages were determined using  $^{206}\text{Pb}/^{238}\text{U}$ -ratios with a common-Pb correction according to TERA-WASSERBURG. Three different age groups could be distinguished that also correlate with distinct ranges in zircon Th/U-ratios: A low-CL irregular core with a Th/U ratio of 0.72 and an age of  $507 \pm 11$  (1s) Ma is interpreted as a relic core. The age is consistent with intrusion ages of gabbros, tonalites and granites from the Silvretta Nappe (SCHALTEGGER et al. 1997, POLLER 1997) and the adjacent Ötztal Crystalline Basement (ÖCB) (MILLER & THÖNI 1995). Broad sector-zoned zircon areas with Th/U-ratios in the range 0.35-0.58 yielded a weighted mean age of  $437 \pm 7$  Ma (n=11). This age is thought to reflect magmatic growth of the zircons in the eclogite precursor, reflecting a Silurian/Ordovician magmatic event within the Eastern Alpine basement. The youngest event recorded led to the formation of

narrow, irregular rims around zircons with very low Th/U-ratios in the range 0.01-0.29. The weighted mean age of these rims is  $351 \pm 22$  Ma which is interpreted as the age of the HP-metamorphic overprint. This would be consistent with Sm/Nd-mineral isochron ages of eclogites from the adjacent ÖCB that are in the range 370-340 Ma (MILLER & THÖNI 1995). The U-Pb zircon SHRIMP ages presented here clearly support the assumption of a widespread Variscan HP-event W of the Tauern Window.

### References

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