

In situ LA-ICP-MS study of zircon from UHP eclogites (Sulu deep drill hole, CCSD): dating of metasomatically controlled zircon growth during retrogression.

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Cores from the Chinese Continental Scientific Drilling (CCSD), in the southern segment of the Sulu UHP terrane, consist mainly of eclogites, ortho- and paragneisses, ultramafic rocks, and some schists and quartzite. A number of petrographic and isotopic studies have shown that all of the Dabie-Sulu UHP rocks underwent prograde metamorphism related to plate subduction, with subsequent decompression-recrystallization related to exhumation of the subducted plate and consequent amphibolite-facies retrograde metamorphism. Existing zircon studies reveal three different metamorphic events: a 244-236 Ma "precursor" UHP event, a 230-220 Ma "main" UHP event, and a 220-205 Ma amphibolite facies overprint (e.g., Hacker et al. 2006). However, despite numerous studies of inclusions in zircon and their relevance for the PT-path, little is known about the zircon growth itself.

The eclogite core samples investigated show zones, related to fluid influx, where the whole range of metamorphism from UHP to greenschist facies occurs within a few centimetres. Inductively coupled plasma mass spectrometry (ICP) *in-situ* measurements on zircon in such a fluid influenced shear zone were undertaken in order to: (1) document the petrological evolution of distinct zones in eclogite, (2) link the appearance of *fluid and zircons* in the Sulu region, (3) get a better age resolution of the post peak evolution. Based on CL images, three domains can be identified in most zircons, i.e. bright-luminescent cores, lower luminescent mantling zones (rim I) and narrow light rim II (not visible on every zircon). The cores preserve oscillatory zoning, some with irregular patterns, whereas the rims are more or less homogeneous. Ninety-two spots were analysed from 35 zircons of the altered inner part of the eclogite sample. The core analyses yield a discordia that intersects at 784 ± 20 and 207.6 ± 6.8 Ma. Data from the cores yield apparent $^{206}\text{Pb}/^{238}\text{U}$ ages from 221 to 728 with Th/U ratios of 0.04-1.12. Some of these data points lie on the boundary of rim and core, so are probably mixed ages. Analyses of the rims (22 points) are concordant within the analytical uncertainty and give ages from 180 to 213 Ma with a weighted mean age of 207 ± 2 Ma.

Textural relationships indicate that U-Pb ages of the rims reflect the end of post peak crystallisation under low grade metamorphic conditions.

BR Hacker, SR Wallis, L Ratschbacher, M Grove (2006) High-temperature geochronology constraints on the tectonic history and architecture of the ultrahigh-pressure, *Tectonics* Vol. 25, TC5006, doi:10.1029/2005TC001937

Abs. No. **487**
Meeting: **DMG 2008**
submitted by: **Riemann, Astrid**
email: **ariemann@geo.uni-**
potsdam.de
date: **2008-06-02**
Req. presentation: **Vortrag**
Req. session: **S07**