

Report of the presentation of PhD research results at the "The Alice Wain Memorial West Norway Eclogite Field Symposium 2003"

The presentation has been supported by the Molengraaff Fonds with 750€.

Presenter: Dirk Spengler

Titel: On microstructural methods to obtain pressure-temperature estimates from relic majoritic garnet microstructures.

The Eclogite Field Symposium focused on dynamic processes of high- and ultrahigh-pressure metamorphism and the exhumation of eclogites and associated rock types. Main topics covered micro- through macro-scale processes including mineralogy, geochemistry, microstructures, geochronology, field relationships and exhumation mechanisms, and kinetic and thermodynamic considerations of HP-UHP metamorphic rocks in order to contribute to the international interest in understanding of lithosphere dynamics.

My oral presentation, based on the abstract submitted (also to the Molengraaff Fonds in May, 2003), was held at the 26th of June, 2003. This contribution represented a part of the results from the first 16 month of my PhD research. Therein I compared two different methods for determining pressure estimates based on microstructures in minerals: an integrated chemical analysis with the electron microprobe vs. two dimensional image analyses with electron microscopes and digital image computing. Emphasis has been given on the second method with quantifying the spatial distribution effect of microstructures. As a result, similar pressure estimates to previous investigations have been confirmed, but higher temperature conditions for peridotites in the Western Gneiss Region have been suggested. A high temperature environment is unknown for this region and in contradiction to previous conclusions, but in accordance with another presentation at the same conference held by G. Medaris, who works on peridotites close by. All abstracts have been printed in the conference abstract volume (NGU Report 2003.055, ISSN 0800-3416).

During accompanied field excursions I sampled HP and UHP rocks from other locations and discussed scientific problems with individual people. Furthermore, I contributed to the field trips through my PhD field area on two days with the description of different rock types and so far unpublished observations and measurements done by myself.

I appreciated very much the interest of H.K. Brueckner in some of the rocks from my working area containing a porphyroclastic texture. Together we chose appropriated samples (garnet-pyroxenites) for a collaborated geochronological project. Subsequently, I went to the Lamont-Doherty Earth Observatory at Columbia University in New York for isotope chemistry and TIMS measurements on those samples in winter 2003. The results will be presented at the 32. IGC in Florence this summer.

Herewith I would like to thank the committee of Stichting Molengraaff Fonds for the financial support of my participation in the Eclogite Field Symposium 2003 in Norway, covering a part of my total costs. It enabled me to present new results on the evolution of garnet peridotites occurring in the Western Gneiss Region with the suggestion of an unrecognised high temperature event. Especially, the potential for developing collaborative projects during discussions with other scientists was a new

experience for me.

Annotation: I delayed this report because of isotope measurements at Lamont-Doherty, which needed to be re-run as some of them failed by technical problems. My wish was to include them into the report in order to demonstrate further positive implications from conference presentations in form of a submitted paper. This report is without this data as I have only half of the results until now.