

Lu-Hf garnet geochronology of Peak-Metamorphism in the Tromsø Nappe, Northern Norway

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The Tromsø nappe marks the upper part of the Uppermost Allochthon of the Scandinavian Caledonides. The nappe comprises metamorphic rocks such as eclogites, schists, marbles and gneisses. For two eclogite units at Tønsvika and Tromsdalstind, thermobarometric modelling yielded P-T conditions of 3.36 GPa at 735°C for Tønsvika [1] and up to 3.2-3.5 GPa at 720-800°C [2] for Tromsdalstind. The samples are therefore part of the UHP metamorphism, where the diamond stability field was achieved (at Tønsvika) [3].

In this study we present petrological and geochronological data of two eclogite samples from Tønsvika and Tromsdalstind. In both samples, the main rock-forming minerals are garnet, omphacite, plagioclase, amphibole and rutile. We interpret Lu and Mn distributions in garnets as preserved growth zoning and thus the Lu-Hf ages as dating prograde metamorphism.

The ages presented here are the first Lu-Hf garnet ages in this area. A five-point isochron including three garnet, one whole rock and one omphacite separate for the eclogite from Tønsvika yields an age of 450.6 ± 4.0 Ma. The Tromsdalstind eclogite yields an age of 445.7 ± 5.3 Ma, based on two garnet and one whole rock separate. These Lu-Hf ages are comparable to the U-Pb ages of 448.8 ± 1.4 Ma (rutile in eclogite, Tromsdalstind) and 452.1 ± 1.7 Ma (eclogitic zircon, Tønsvika) [4]. Our ages imply that these minerals have grown at peak-pressure conditions in the eclogite facies and they do not have any effects on the measured ages.

[1] Krogh Ravna & Roux (2006), *Int Geol Rev* **48**, 861-881.

[2] Janák *et al.* (2012), *J Metamorph Geol* **30**, 377-396. [3]

Janák *et al.* (2013), *J Metamorph Geol* **31**, 691-703. [4]

Corfú *et al.* (2003), *Contrib Mineral Petr* **145**, 502-513.