



HP-HT evolution of the Sunnmøre district, Western Gneiss Region (WGR), Norway: new constraints obtained with two independent methods

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Two independent methods allow us to constraint the P-T evolution of the Sunnmøre district metamorphic rocks, located near the outer limits of the Sorøyane UHP domain (WGR, Norway). On the one hand, classical (simple and multi-equilibrium) thermobarometry is used to compute P-T estimates relative to the eclogite peak and retrogression assemblages. On the other hand, Zr in rutile thermometry has been applied to rutiles in inclusion in the eclogite facies paragenesis and to rutiles associated with the retrogression assemblages.

Results obtained by both methods are consistent and provide new data for the study of the WGR. A HP-HT eclogite peak has been recorded at *c.* 2.1GPa, 850°C. Those P-T conditions are not compatible with the current UHP borders of the Sorøyane UHP domain. The eclogite stage is followed by a temperature peak culminating at *c.* 1.4GPa, 950°C. Such high temperatures and such a retrograde heating do not seem to have been reported in the WGR yet. However, they are consistent with the pervasive migmatization associated to the syn-exhumation structures.

The observed melting rate (>30%) leads to dramatic rheological changes. Hence, exhumed rocks of the Sunnmøre district could not belong to rigid portions of crust. Moreover, this study suggests that P-T path shapes are heterogenous at the WGR scale. Those two implications highlight the fact that the continental crust is not exhumed as a coherent unit and that a complex circulation took place in the subduction channel. Juxtaposition of HP-HT and UHP-BT metamorphic rocks in the same orogenic wedge is a strong constraint on thermal structures of collision structures.