P–T–t evolution of the UHT Rogaland–Vest Agder Sector, SW Norway

ELEANORE BLEREAU[1*], CHRIS CLARK[1], TIM JOHNSON[1], RICHARD TAYLOR[1], PETE KINNY[1], MARTIN HAND[2]

[1] Department of Applied Geology, Curtin University, Perth, Western Australia (*correspondence: eleanore.blereau@postgrad.curtin.edu.au)

[2] Centre for Tectonic Resources and Exploration, School of Earth and Environmental Sciences, University of Adelaide, Adelaide 5005, South Australia

The Rogaland–Vest Agder sector of SW Norway is an ultrahigh-temperature (UHT) metamorphic province that has experienced a number of tectonothermal events but has not seen any major overprinting events since the Sveconorwegian Orogeny (1200–900 Ma). This provides a unique opportunity to study a UHT orogen and the effects of anorthosite emplacement (Rogaland Igneous Complex; RIC) into high grade rocks. Two alternative *P–T* paths have been proposed for the host rocks of the RIC; a polymetamorphic evolution [1, 2] versus a singular long-lived *P–T* path [3]. To resolve these contradictory models we use SIMS U–Pb geochronology and thermodynamic modelling (THERMOCALC ds6) of a suite of samples that are proximal, intermediate and distal to the RIC contact to investigate the temporal effects of the RIC on the metamorphic evolution of the enclosing terrane. The samples are granulite facies rocks with complex petrographic relationships between high-grade minerals including spinel, sillimanite, orthopyroxene, garnet, cordierite, sapphirine and osumilite. Phase equilibria modelling yields peak regional metamorphic conditions of 840–950 °C at 7–9 kbar and 910–980 °C at ~5–7 kbar for the distal and intermediate samples respectively. The proximal sample preserves clear petrographic evidence for two thermal peaks, a regional event with similar conditions to that experienced by the distal sample, and a later contact event with metamorphic conditions of ~950 °C at ~5–6 kbar. U–Pb geochronology of metamorphic zircon returned ages of c. 1100–900 Ma (distal) and c. 1050–900 Ma (proximal) with monazite ranging from 1050–920 Ma from the distal sample. These age ranges are similar to current published data [1, 2, 3] for Rogaland.

[1] Möller *et al*. (2003) *Geo. Soc. London, Sp. Pub*. **220**, 65-81. [2] Tomkins *et al*. (2005) *Journal of Metamorphic Geology*, **23**, 201-215. [3] Drüpple *et al*. (2013) *Journal of Petrology*, **54**, 305-350.