

Lu-Hf geochronology of apatite from felsic gneisses in the Western Gneiss Region, Norway.

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Felsic igneous rocks comprise a major proportion of both the modern and ancient continental crust, and so extracting reliable geochemical information about their formation is of significant interest. The analysis of apatite is potentially useful for this purpose, as it occurs widely as an accessory phase, incorporates a range of geochemical information upon crystallisation, and is amenable to dating by a variety of isotope decay systems. This study contributes to our understanding of the behaviour of Lu-Hf isotopes in apatite, providing a foundation for future applications to ancient rocks to understand the evolution of the crust. By applying microbeam Lu-Hf geochronology [1] to apatite from rocks that have experienced variable degrees of metamorphic and thermal overprinting, we aim to better understand what is recorded by the Lu-Hf ages of apatite.

This study focuses on felsic gneisses from the Western Gneiss Region (WGR), Norway, which, subsequent to their formation at ~1.6 Ga, have undergone Sveconorwegian overprinting, and Scandian W-ward subduction, producing ultra-high-pressure metamorphism in the Northwestern part of the region [e.g. 2,3]. Therefore, the WGR is characterised by increasing pressure and temperature gradients toward the northwest [e.g. 2,3]. We will present Lu-Hf ages of apatite from rocks sampled systematically across the regional Scandian temperature and pressure gradients to better understand the effects of temperature and pressure on Lu-Hf systematics in apatite.

These data will allow us to better understand the controls on the redistribution of Lu and Hf isotopes in apatite at mid-lower crustal conditions, improving our ability to accurately assess the geological and temporal context of other geochemical information recorded by this mineral.

[1] Simpson, A., et al. (2021), *Chemical Geology*, 577, 120299

[2] Griffin, W. L. (1985), *The Caledonide Orogen.*, 783-801

[3] Austrheim, H., et al. (2003), *Precambrian Research*, 120(1), 149-175