Strontium isotopes in plagioclase constrain mantle sources and crustal differentiation processes of the Skaergaard Intrusion and Kialineq Complex of eastern Greenland

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Greenland's eastern margin experienced long-lived, voluminous, and compositionally diverse magmatism spanning most of the Cenozoic. Early activity, including the emplacement of large volumes of tholeiitic basalt and gabbro, is associated with continental rifting prior to and during the opening of the North Atlantic. Later magmatism, following the onset of seafloor spreading, is characterized by numerous gabbro-syenite complexes and is generally associated with the passage of eastern Greenland over the Iceland plume axis. Therefore, the margin records the transition from continental rifting, with regional flood basalt emplacement, to localized alkaline intraplate magmatism. In this study we use Sr isotopes in plagioclase (measured *in situ* by LA-MC-ICPMS) together with whole-rock and mineral geochemistry to compare mantle sources and crustal differentiation processes of two intrusions: the ca. 56 Ma Skaergaard layered intrusion and the ca. 36 Ma Kialineq gabbro-syenite complex. The former represents rift-related magmatism (though also potentially associated with the Iceland plume), while the latter represents off-spreading-axis magmatism. The least evolved samples from the lower ~150 m of the Skaergaard layered series contain plagioclase with $^{87}Sr/^{86}Sr_{(i)}$ = ~0.7041–0.7042. Despite monotonic upward differentiation recorded by whole-rock and mineral compositions, plagioclase $^{87}Sr/^{86}Sr_{(i)}$ reaches a uniform value (~0.7044) throughout the rest of the layered series. This is consistent with the largely closed-system differentiation history commonly inferred for the Skaergaard. In contrast, mafic rocks from Kialineq contain plagioclase populations with lower $^{87}Sr/^{86}Sr_{(i)}$ (weighted means as low as 0.7030) and display more variability within and between samples, reflecting contamination and magma mixing that is evident from field relationships. On-going work is focused on: 1) elucidating the contrasting differentiation histories of the two intrusions, and 2) determining whether the different isotope compositions of the least evolved samples from each reflect isotopically distinct mantle sources or are an artefact of differentiation and contamination in the crust.