**Chemical and isotopic stratigraphy at the boundary between two macrocyclic units in the Bjerkreim-Sokndal intrusion (Rogaland, SW Norway)**

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Th NW part of the Bjerkreim-Sokndal intrusion consists of a 6 km thick layered series. Five macrocyclic units (MCUI to V) have been recognized by P. MICHOT. Each unit is essentially made of anorthosites-leuconorites at the base and grades upwards into more mafic rocks. Within each MCU, phase layering has allowed the identification of numerous cumulate zones; the major minerals (plag, 2 pyrox, oliv, Fe-Ti oxides) show well developed cryptic variations. Each unit is interpreted as resulting from the crystallization of a new magma influx. This paper is focused on the MCUIII/IV transition across a profile at Storeknuten. At the top of MCUIII (zone IIIe) the main cumulus phases are plag An44 and opx Mg#71, accompanied by Fe-Ti oxides, apa and cpx. After a 30 m thick anorthosite unit (IVa), a 75-100 m thick olivine-bearing zone (IVb) occurs at the base of MCUIV. This zone shows the most primitive mineral compositions of the whole sequence with An52, opx Mg#77, Fo66-76.

Trace elements also show marked variations. The Sr content in separated plagioclase increases from 925-950 ppm in IIIe to 1100 ppm in IVb then decreases again to 975 ppm in IVd (K shows an opposite trend). The Ni and Cr contents of the Fe-Ti oxides (ilmenite and magnetite) increase by a factor 8 to 10 in IVb compared to IIIe.

$^{87}Sr/^{86}Sr$ ratios of plag are in the narrow range 0.70608-0.70600 at the top of IIIe; it slightly decreases to 0.70600 in IVa then dramatically drops to 0.70493 at the base of IVb after which it increases regularly to 0.70582 in IVd.

The plag $\delta^{18}O$ values are close to +7.6‰ for both IIIe and IV zones which is reasonable for subsolidus feldspar from a magma of this composition.

The compositional reversal observed at the MVUIII/IV transition can be explained by the injection of a relatively primitive magma into the chamber. The magma residing in the chamber is believed to have been compositionally zoned. The new influx initially mixed (possibly by a fountaining process) with the basal layer(s) to produce the hybrid zone IVa, which has intermediate compositions between zones IIIe and IVb. Continued influx resulted in ponding of the dense, primitive magma on the floor; this crystallized to produce the primitive rocks of zone IVb.

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