Evidence for correlation of late CFBs from East Greenland and the Faeroe Islands (North Atlantic Igneous Province)

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The Faeroe Islands formed early as part of the North Atlantic Igneous Province (NAIP) and is composed of a 4-5km thick basaltic lava sequence erupted before and during continental breakup ~56-55 Ma ago (Storey *et al.* 2007). The present dataset represents the syn-breakup part of the sequence and comprises both enriched high-Ti plume related basalts and depleted MORB-like low-Ti basalts. The Faroese lavapile has earlier been correlated geochemically with the East Greenland Paleogene lavaseries from Kangerlussuaq and Blosseville Coast by Larsen *et al.* (1999), where the Faroes Middle and Upper Formations were correlated with the Milne Land Formation (MLF) from East Greenland. New data from the southern island of Sandoy on the Faeroe Islands shows that thin counterparts of the East Greenland Geikie Plateau Formation (GPF) and Rømer Fjord Formation (RFF) are present on the Faeroe Islands in the very top of the sequence. The correlation is based on variations in Zr/Nb and $^{206}Pb/^{204}Pb$ but is also consistent with petrological observations that GPF and RFF lavas are mainly aphyric and RFF lavas have lower contents of SiO_2. This means that volcanism has proceeded longer than previously thought on the Faeroe Islands although in this area with much reduced eruption rates.

The isotopic compositions of the Faroes and East Greenland Palaeogene lavas show that the high-Ti basalts from MLF and GPF and their Faroese counterparts are all centered around the Icelandic IE2 end-member from Thirlwall *et al.* (2004), while the RFF lavas belong to the IE1 end-member. The depleted low-Ti lavas from the riftzone show only few examples of mixing between high and low-Ti magmas/sources and the low-Ti lavas can be modelled as mixtures between a MORB source and a component identical with the NAEM composition of Ellam and Stuart (2000). The proposed Icelandic depleted plume end-member ID1 (Thirlwall *et al.* 2004) does not seem to be present in the Paleogene lavas which is an argument against its existence.

References

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Occurrence and origin of igneous fragments in chondritic breccias

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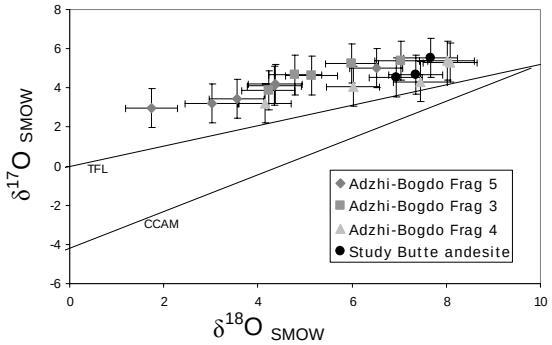
The ordinary chondrite breccias Adzhi-Bogdo (LL3-6) and Study Butte (H3-6) contain igneous-textured inclusions that are best described as alkali-granitoids in Adzhi-Bogdo (Bischoff *et al.*, 1993) and andesite in Study Butte (Fredriksson *et al.*, 1989). Both the granitoids and the andesite appear to have been formed by melting and magmatic differentiation on a parent body and indicate mixing of achondritic fragments with chondritic components.

Al-Mg isotope data for these igneous-textured clasts reveal no evidence for radiogenic ^{26}Mg and indicate that the formation of these igneous clasts, the incorporation into the parent body regolith, and the lithification must have occurred late, after almost all ^{26}Al had decayed (Sokol *et al.*, 2007).

Oxygen isotope ratios of plagioclase, quartz and pyroxene in the fragments were measured in situ with the CRPG-CNRS Cameca IMS 1270 ion microprobe. On a three-O isotope diagram all fragments fall in the range of ordinary chondrites (Fig 1). These results imply that the fragments derive from an ordinary chondrite precursor and that the granitic fragments may have formed on the same parent body as the surrounding host rock material. The andesite seems to derive from a LL chondrite in contrast to its host rock (which is H3-6). This in turn indicates that melt formation and extreme differentiation occurred on ordinary chondrite parent bodies in the early stage of solar solar system formation. Alternatively, the fragments may have formed on another parent body but within the same oxygen isotope region of the solar nebula. In this case, they may represent projectile fragments within the chondritic breccias.



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