Beard’s (2008) welcome Comment offers us the opportunity to discuss and clarify certain aspects of our paper (Jagoutz et al., 2007). Beard raises points about our reinterpretation of his originally postulated genetic link between albitite clasts recovered from a breccia and a coarse-grained kaersutite pegmatite intrusive into peridotites (site 1070, Ocean Drilling Program [ODP] leg 173) (Beard et al., 2002). It is essential to first review the geological and petrological aspects of the albitite clast and pegmatite. However, we emphasize that our model is not affected by the relationship between the albitite clasts and the pegmatite.

The albitite clast was recovered from a breccia drilled at ODP site 1070 on the Iberia Margin (Fig. Supp. 1, Data Repository item 2007270 of Jagoutz et al., 2007). The breccia is a heterogeneous assemblage of clasts containing calcite, serpentine and possibly amphibolite clasts together with gabbroic and albitite clasts (Whitmarsh et al., 1998), and it is unknown whether it is composed of locally derived components. It is separated by an ~20-cm-wide gouge zone from the underlying unit, which contains the kaersutite pegmatite. A genetic link between the albitite clast and the pegmatite is thus an interpretation that awaits further investigation. It has been shown that albitites (or plagiogranites) might be substantially younger than gabbros (Costa and Caby, 2001). Recent work proposed that hydrous partial melting of mafic rocks is an alternative mechanism to form plagiogranites (Koepke et al., 2007). The proposed magmatic link is the key of to the interpretation of Beard et al. (2002), who equated the U-Pb data on a single zircon from an albitite clast to the intrusion age of the kaersutite dike. Out of six spot analyses, only four yield statistically significant results of 124, 126, 130 and 112 (all ± 7) Ma. A weighted mean age (excluding the 112 Ma age) yielded 127 ± 4 Ma (Beard et al., 2002).

Beard et al. (2002) interpreted the albitites as modified differentiation products derived from the kaersutite pegmatite. The only argument put forward in favor of this interpretation by Beard at al. (2002, p. 900, lines 13–14) is the “high” Ti2O3 content (1.26 wt% and not 1.5 wt% as stated in the Comment) observed in tremolitic hornblende, which “clearly suggest derivation from a high-Ti (e.g., kaersutitic) precursor” (Beard, 2008). The observed Ti2O3 content is not unusual for hornblende and is significantly lower than that found in the kaersutitic amphibole (4.3–5.2 wt%). Therefore, the genetic relationship between albitite and kaersutite pegmatite based solely on Ti content of metamorphic amphibole is highly speculative. Beard further argues that Na enrichment in the hornblende rim reflects the igneous evolution of the interstitial melt. This statement is not supported by Beard et al.’s (2002) data. In their amphibole zoning plot (their Fig. 5), it is not Na2O that increases, but the A-site occupancy. The latter cannot be related to Na2O concentration in amphibole as Na occupies two different sites, M4 and A. The Na2O concentration (Table 2 of Beard et al., 2002) is 2.94 wt% in the amphibole core and 3.13 wt% in the Fe-rich rim. This is not a significant Na enrichment, but a subtle variation considering microprobe uncertainties. The change from tschermakite to Fe-pargasite is typical for blackwall formation in altered mafic rocks within ultramafic bodies (Frost, 1975), and is unrelated to igneous processes. We note also the dramatic decrease of K2O and TiO2 in the amphibole toward the rim (Beard et al., 2002), which are likely to increase in igneous zoning. We conclude that the statements of Beard et al. (2002) and Beard (2008) that albitites are easily attributed to fractionation remain unproven. Beard speculates that the mineral assemblage used by us to distinguish between different magmatic sequences could again be easily attributed to fractionation. It is beyond the scope of this Reply to document in detail why they are not easily related. On the basis of mineral assemblage and major and trace element chemistry (Müntener and Manatschal, 2006) we emphasize the similarity of albitite dikes from ODP sites 1070 and 1277. In addition, the paleodistance between sites 1070 and 1277 at the moment of their accretion (about M1) does not exceed 20–30 km, differing from the statement by Beard.

Beard questions our statement that the amphibole age approximates the pegmatite intrusion age. However, the inferred ambient temperature of >1000 °C at the time of pegmatite emplacement (Beard et al., 2002) is a strong speculation, as this high ambient temperature would leave almost no temperature window for amphibole crystallization.

Finally, we agree that the magmatic history of the Iberia-Newfoundland margin needs more high-resolution U-Pb ages to resolve temporal differences between different magmatic pulses.

REFERENCES CITED