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The Brava seamount, Cape Verde: Beyond the spatial extent of EM1 and petrogenesis of highly evolved alkaline lavas.

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Alkaline lavas from the Brava seamount, Cape Verde are investigated to establish the spatial distribution of compositional heterogeneity in the southwest of the Cape Verde archipelago. Highly evolved lavas provide a record of shallow level magma-crust interaction beneath the Brava seamount.

The Brava seamount, located southwest of the island of Brava, Cape Verde was sampled during research cruise 8/85 of the R.R.S. Charles Darwin in 1985. Two groups of highly evolved alkaline volcanics are distinguished from the Brava seamount: 1) pyroxene-phonolites containing clinopyroxene, amphibole, nepheline, $\pm$biotite, and minor sanidine and 2) feldspathoid-phonolites containing nepheline, nausean, minor biotite and leucite. All of the samples have MgO between 0.8 and 2 wt%, comparable to the most evolved volcanics sampled in the Cape Verde archipelago. The feldspathoid-phonolites have NaO_2 of 12-13 wt%.

Alkaline lavas from the Brava seamount have higher $^{87}Sr/^{87}Sr$ (0.70337 to 0.70347) at εNd of +6 to +7 than previously sampled in Cape Verde. Sr isotopes will be integrated with oxygen isotopes to establish magma and crust interactions in the magmatic plumbing system beneath the Brava seamount. Clinopyroxene-melt thermobarometry will be presented to constrain the depths of equilibrium crystallisation. Sr-O isotopes and thermobarometry will be combined to build a picture of the levels of magma stalling and interaction between magmas and the crust beneath the Brava seamount.

The Brava seamount phonolitic lavas have high $^{206}Pb/^{204}Pb$ of 19.5 to 19.8 with negative Δ8/4 and high εNd of +6 to +7 in contrast to the positive Δ8/4 for lavas from nearby Brava and the southern islands of the Cape Verde archipelago. Lavas from the Brava seamount have Pb-Nd isotope systematics comparable to the northern Cape Verde islands, indicating the southwestern boundary in mantle heterogeneity and thereby the spatial extent of the EM1-like source contributing to the southern islands.

The extensive crystallisation and stalling of magma batches at crustal depths shown by thermobarometry will be used in conjunction with geochemistry to constrain the origin of assimilants and implies that an EM1-like source is not found in the mantle source, the shallow lithosphere or crust beneath the Brava seamount.