

Geochemical characteristics of the mantle in the Scotia arc region constrained by osmium isotopes and platinum-group elements

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The Scotia arc region, located between the southeastern Pacific and the southwestern Atlantic oceans, is a fundamental location where we can decode geochemical characteristics of the circum-Antarctic mantle since mantle peridotites are tectonically exposed to the surface or ocean floor in the region. Yet, their geochemical characteristics have not fully characterized due mainly to the hardness to collect samples from the region. Here, we report petrography of 10 peridotites from the Scotia arc region, and investigate them using isotopic and trace-element analyses to identify the origin of the circum-Antarctic mantle.

The peridotites are 9 dunites from Gibbs island (South Shetland islands), and 1 dunite from Bruce Bank (during KH19-6-Leg4 cruise). The Gibbs island dunites are moderately to highly serpentinized, whereas the Bruce Bank dunite is completely serpentinized and intruded by significant amounts of network-like calcite vein. Irrespective of such secondary chemical modifications, bulk major-element compositions support they are dunite rather than harzburgite or lherzolite.

We present Os isotope and platinum-group element (PGE) compositions of the mantle peridotites from the Scotia arc region, and discuss their origin in the context of depletion age calculated from Os isotope composition and degree of melting estimated from PGE composition.

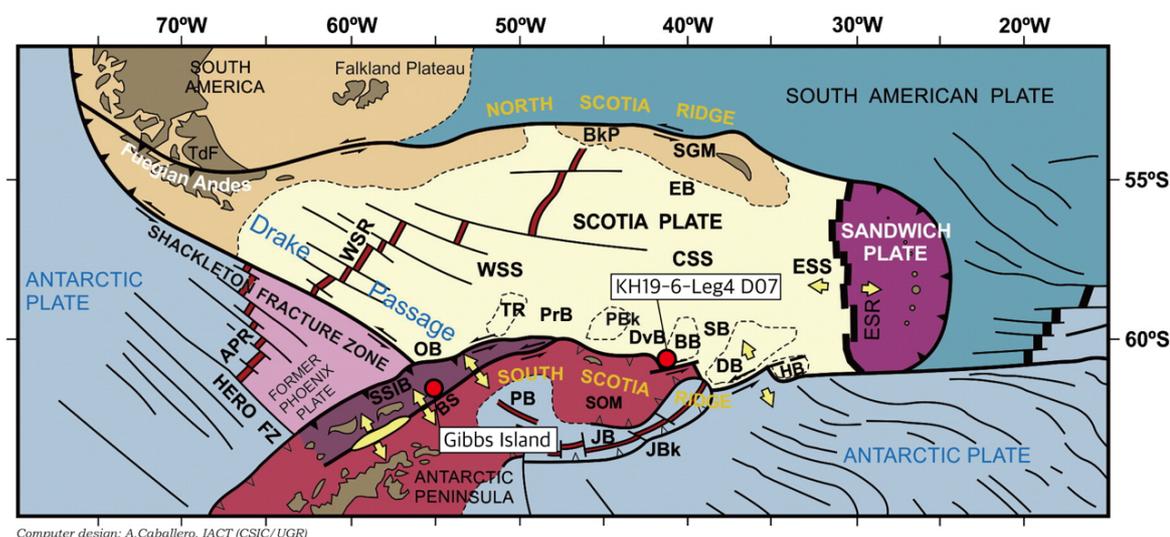


Fig. 1. Tectonic setting of the Scotia Arc.

Modified after Maldonado *et al.* (2015)

References

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- Maldonado, A., Dalziel, I. W. and Leat, P. T., The global relevance of the Scotia Arc: an introduction, *Global and Planetary Change*, 125, A1-A8, 2015.