Os and Hf isotopes in rare K-rich basalts from the southern Kermadec Arc volcanic front.

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Clark Volcano, the southernmost volcanic ediface of the oceanic Kermadec island arc volcanic front, comprises basalts, andesites and dacites typical of the Kermadec arc, but also includes a rare suite of mafic lavas with high K, Ba and LREE concentrations (e.g. K_2O ~2 wt% compared with ~0.2 wt% at 50wt% SiO_2) [1]. These have been interpreted as representing small volume sediment-dominated melts from near the slab-mantle interface that were extracted with minimal interaction with either the overlying mantle wedge or the arc crust[1] and thus represent a relatively undiluted sampling of the slab component.

We will present Os and Hf isotopic data, in conjunction with trace element and previously published Sr, Nd and Pb isotopic data, for samples of both K-rich and typical Clark lavas to investigate the nature of this recycled component and to test whether a recycled Os isotopic signature can be detected.

Several studies of supra-subduction peridotite samples indicate that Os may be transferred from the downgoing slab to the mantle wedge, however the extent of Os recycling is unclear. Os concentrations in the mantle wedge are likely to be significantly higher than in slab-derived melts or fluids, diluting the affect of slab addition to the source, particularly if the transfer of Os is localised in nature rather than pervasive. Furthermore, low Os concentrations in erupted arc lavas render them particularly vulnerable to upper level crustal contamination. Targeting intra oceanic arc lavas that on the basis of other geochemical indicators carry unusually strong slab signatures, offers perhaps the best potential for deconvolving slab Os from upper level Os contributions.

References

[1] Gamble J.A., Christie R.H.K, Wright I.C. and Wysoczanski R.J. (1997) *Can. Min.* **35,** 275-290.