

W isotopic composition and concentration of oceanic island basalts

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To understand W behavior during magmatic differentiation and to detect the evidence of core-mantle interaction using W isotopic tracer, the W abundances and isotope compositions were analyzed for oceanic island basalts (OIB) from French Polynesia, Samoa, St. Helena and Hawaii. Global seismic tomography suggests that plume sources of French Polynesia and Samoa may originated from the core-mantle boundary. An additional reason for analyzing OIB in French Polynesia and St. Helena is that some of them are classified into HIMU (high time integrated ²³⁸U/²⁰⁴Pb or high μ)OIB, which was considered to tap the mantle source with minor contributions of recycled sediments with high W abundance. Core-mantle interaction has been discussed for the samples from Hawaiian island using Os, Tl and W isotope ratio and Fe/Mn ratio from 1990's [1-5]. We have also worked on Hawaiian samples.

We will present the data of tungsten isotope ratio and concentration of OIBs and discuss the core-mantle interaction using our data.

[1] Brandon *et al.* (1998) *Science* **280**(5369), 1570-1573.
[2] Collerson *et al.* (2002) *Geochimica et Cosmochimica Acta* **66**, (15A) A148. [3] Scherstén *et al.* (2004) *Nature* **427**, 234-237. [4] Humayun *et al.* (2004) *Science* **306**, 91-94. [5] Baker & Jensen (2004) *Earth & Planetary Science Letters* **220**(3-4), 277-286.

Application of NMR to characterize Intact Polar Lipids in deep biosphere

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Intact polar lipids (IPLs) are attractive analytical targets in deep biosphere study, because they are taxonomically more specific than their apolar derivatives and avoid signals from prokaryotes that primarily build their membranes with ether-bound lipids such as archaea and some bacteria (e.g. Sturt *et al.* 2004 [1]). Applying chromatographic separation by high-performance liquid chromatography (HPLC), Rutters *et al.* [2] developed a normal-phase chromatography procedure from that primarily separates lipid mixtures according to the polar headgroups. Furthermore, HPLC/ESI-MSn is potentially useful for identifying novel biomarkers for biogeochemistry and microbial ecology by exploiting the taxonomic information encoded in intact membrane molecules from prokaryotes.

However, so far lack of authentic standards prevented identification of chemical structure of whole molecules and polar headgroups in IPLs analogs, and determination of absolute concentrations because response factors of different IPLs in LC/MS could vary significantly. On the purpose of overcoming such difficulties, here we propose a usage of Nuclear Magnetic Resonance (NMR) spectroscopy together with LC/MS technique in the quantification and structural assignment of IPLs. In this presentation, we will report preliminary results of sub-seafloor core samples collected by shakedown cruise of drilling vessel Chikyu (CK06-06) at offshore of Shimokita Peninsula, Western Pacific Ocean.

[1] Sturt *et al.* (2004) *Rapid Communications in Mass Spectrometry* **18**(6), 617-628. [2] Rutters *et al.* (2002) *Journal of Microbiological Methods* **48**(2-3), 149-160.