

HR: 12:05h

AN: **V42B-08** [Abstracts]

TI: **Crustal recycling model: testing by linking petrology with isotope geochemistry**

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AB: Recycling of subducted oceanic crust is widely thought to explain much of the chemical and isotopic heterogeneity of Earth's present-day mantle (1). Recycled subducted ocean crust has been traced by elevated 187Os/188Os in some studies (2-4) and by high Ni and low Mn contents in others (5,6). Recently, we have linked these tracers for the first time (7). We combine data for averaged compositions of olivine phenocrysts for olivine rich lavas and bulk rock 187Os/188Os ratios from Iceland and Hawaii, and we apply the method (6,7) to obtain the proportion of pyroxenite derived melt by both Ni excess and Mn deficit in olivine. The observed strong correlation for quaternary lavas of Iceland significantly strengthens the recycling model (1,8). It allows us to estimate the Os isotopic composition of both the recycled crust and the mantle peridotite, thereby constraining the model ages of end-members. We show that Icelandic quaternary lavas require an ancient crustal component with model ages between 1.1 and 1.8 Ga and a peridotite end-member close to present-day oceanic mantle. The similar data for Hawaii suggest younger ages of recycled material: 0.5-1 Ga. References: 1. A.W. Hofmann, W. M. White, EPSL. 57, 421 (1982) 2. J. C. Lassiter, E. H. Hauri, EPSL 164, 483 (1998). 3. A.C. Skovgaard et al, EPSL 194, 259 (2001). 4. A. D. Brandon et al., GCA

71, 4570 (2007). 5. A.V. Sobolev et al., Nature 434, 590 (2005). 6. A.V. Sobolev et al., Science 316, 412 (2007). 7. A.V. Sobolev et al., Science 321, 536 (2008). 8. C. Hemond et al., JGR–Solid Earth 98, 15833 (1993).

DE: 1025 Composition of the mantle

DE: 1037 Magma genesis and partial melting (3619)

DE: 1038 Mantle processes (3621)

DE: 1065 Major and trace element geochemistry

DE: 3640 Igneous petrology

SC: Volcanology, Geochemistry, Petrology [V]

MN: 2008 Fall Meeting