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## Trace element concentrations in ocean floor peridotites: the pursuit of real mantle signatures

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Ocean floor peridotites are usually variably serpentinized and weathered, resulting in a wide range of modifications in both major and trace element abundances and isotopic compositions (e.g., Morishita et al., 2009 *J. Petrol.* 50, 1299-1325, and references therein). Serpentine acts as an important sink for H<sub>2</sub>O and fluid-mobile elements and, therefore, is crucial for global geochemical cycling. On the other hand, elemental mobilization during serpentinization of peridotite masks mantle geochemical signatures. In-situ chemical analysis of minerals is required to obtain geochemical characteristics of primary mantle minerals. Optical microscope observation of thin sections permits investigation of heterogeneity within grains such as zoning, exsolution and presence of inclusions, alterations and etc. Light elements (Li, Be, B: LE hereafter) are potentially powerful geochemical tracers of fluid fluxes during metamorphism, metasomatism and partial melting, particularly at ARC setting (e.g., Bebout et al., 1999 *EPSL* 171, 63-81). However, in-situ determination of LEs in common minerals is not an easy task because of their low-abundances. Secondary ion mass spectrometry (SIMS) is currently the widely used technique for the in situ determination of trace element compositions in geological minerals. In SIMS analysis, the analytical time is relatively long, and complex matrix-related interference corrections are often required to obtain accurate results. In the last decade, laser ablation-inductively coupled plasma-mass spectrometry (LA-ICP-MS) has become a powerful and flexible analytical technique for in-situ elemental and isotopic determination of solid materials. The latest generation of high sensitivity ICP-MS is capable of detecting LEs at trace levels with laser ablation sampling (Tiepolo et al., 2005 *Geostand. Geoanal. Res.*, 29, 107-122). In fact, many laboratories have analyzed LE abundances in minerals with LA-ICP-MS (Lee et al., 2008 *G3*, doi:10.1029/2008GC002078). A significant difference between SIMS and LA-ICP-MS is the volume of material sampled during an analysis, with laser-ablation consuming significantly more material than SIMS. We have been examining the similarities and differences in petrological and mineralogical characteristics of ocean floor peridotites between mid-ocean ridge (MOR) and forearc (F-ARC) settings using SIMS and LA-ICPMS methods. We sometimes found a wide range of variation in some trace element compositions (particularly in LEs) of nominally unaltered minerals. In the presentation, we would like to introduce some example of uptake for some elements in minerals with high-resolution FE-EPMA observations, and show our preliminary results on real mantle geochemical signatures.

Keywords: Ocean floor peridotite, SIMS, LA-ICPMS, FE-EPMA