

## Pt-Os and Re-Os systematics of ocean island basalts: Preliminary results

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Knowing the depth from which mantle plume originates is essential for better understanding of mantle dynamics. Platinum, rhenium and osmium are highly siderophile elements (HSE) which are enriched in the Earth's core. Therefore, HSE element data of the plume-related volcanic rocks such as certain ocean island basalts would provide constraints on the contribution of the core materials. The Re-Os isotopic system is based on the beta-decay of  $^{187}\text{Re}$  to  $^{187}\text{Os}$  with a decay constant of  $1.666 \times 10^{-11} \text{ a}^{-1}$  (Smoliar et al., 1996). This system has been widely used to geochemical and cosmochemical problems in this decade. The Pt-Os system is based on the alpha-decay of  $^{190}\text{Pt}$  to  $^{186}\text{Os}$ , with a longer decay constant of  $1.477 \times 10^{-12} \text{ a}^{-1}$  (Brandon et al., 1999, recalculated based on  $^{190}\text{Pt} = 0.01296$  atomic % from the decay constant determined by Walker et al., 1996). The combination of these two isotopic systems is a powerful tool to know mass transfer from the Earth's core to the surface. Since Pt and Re are incompatible relative to Os, the outer core have developed high Pt/Os and Re/Os ratios relative to chondrites because of inner core formation (Walker et al., 1995; 1997). It results in elevation of the time-integrated  $^{186}\text{Os}/^{188}\text{Os}$  and  $^{187}\text{Os}/^{188}\text{Os}$  ratios for OIBs derived from core-mantle boundary (Walker et al., 1995; 1997). Indeed, Brandon et al. (1996; 1999) reported the positive correlation between  $^{186}\text{Os}/^{188}\text{Os}$  and  $^{187}\text{Os}/^{188}\text{Os}$  ratios of the primitive Hawaiian picrites. In line of their work, we have tried to develop analytical procedure for both  $^{186}\text{Os}/^{188}\text{Os}$  and  $^{187}\text{Os}/^{188}\text{Os}$  ratios of common OIBs, whose Os abundance is much lower than picrites.

Since a decay constant of  $^{190}\text{Pt}$  is very low ( $1.477 \times 10^{-12} \text{ a}^{-1}$ ) and, in addition, the parent nuclide abundance is very small (0.01296 atomic %) as mentioned above, variations in the  $^{186}\text{Os}/^{188}\text{Os}$  ratio in OIBs are limited to 150 ppm (0.015 %). Therefore, extremely high precision of at least 80 ppm is required to detect variation in  $^{186}\text{Os}/^{188}\text{Os}$  ratios of OIBs. First of all, we have tried to measure Os isotopic ratios with high precision using Os standard. The Os isotopic ratios are measured on a Thermo Finnigan TRITON mass spectrometer in a negative ion detective mode. The  $^{186}\text{Os}$  ion beam of more than 40 mV allows us to obtain enough precision and reproducibility for application of the Pt-Os isotopic system. An amount of Os standard required to obtain these precision is 10ng in this study. Since the Os contents of common OIBs are 100 ppt, 100g sample powder is necessary for this purpose. Separation of Os from geological materials are performed by fire-assay combined with Carius tube digestion and  $\text{CCl}_4$  extraction.

We are reporting the Pt-Os and Re-Os systematics of certain OIBs in our presentation.