

Re-Os systematics of HMAs and basalts in the Setouchi volcanic belt, SW Japan: Implications for mantle - melt interaction

Katsuhiko Suzuki[1], Yoshiyuki Tatsumi[2]

[1] Inst. Geotherm. Sci., Kyoto Univ., [2] IFREE, JAMSTEC

<http://www.vgs.kyoto-u.ac.jp/>

Primitive high-magnesian andesites (HMAs) and basalts in the Setouchi volcanic belt exhibit large variations both in abundance and isotopic ratios of osmium, with $^{187}\text{Os}/^{188}\text{Os}$ ranging from 0.1718 to 0.2041 and [Os] ranging from 8.1 to 11.5 ppt for HMAs and $^{187}\text{Os}/^{188}\text{Os}$ ranging from 0.1556 to 0.1769 and [Os] ranging from 31.0 to 53.7 ppt for basalts. The obtained $^{187}\text{Os}/^{188}\text{Os}$ ratios are weakly correlated with $1/[\text{Os}]$. Such characteristics may be explained by variable degrees of interaction between mantle wedge peridotites and partial melts of the subducting sediments, because Os could be partitioned more strongly into silicate melts than aqueous fluids. On the contrary, primitive basalts in the NE Japan arc possess $^{187}\text{Os}/^{188}\text{Os}$ ratios of 0.137 - 0.139, which are much lower than those of Setouchi lavas and are in the range of mantle peridotite values in arc tectonic settings. Such Os isotopic signatures may be elucidated by addition of slab-derived fluids rather than slab-melts.