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Different source of Os among basalts and peridotites from the ultra-slow spreading SWIR from 34E to 40E

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The ridge magmatic systems of all oceans are the place directly forming crusts and are good places to observe how different the crust forms among the mid-ocean ridges which have variable spreading rates possibly associated with amount of melt supply. The geochemical studies especially isotopic studies are effective to get information of source of the supplied melts. To investigate one of the unique ridge systems, the central part of the Southwest Indian Ridge (SWIR), known as an ultra-slow spreading system (14-16 mm/yr) is selected. We had two cruises in 2008 (KH07-4 Leg2) and 2010 (KH09-5 Leg4) aboard R/V Hakuho-Maru and dredged aphyric to porphyritic basalts, peridotites, metamorphic and sedimentary rocks from 17 sites during two cruises from 34E to 40E along SWIR (Sato et al., 2008, 2010). The Re-Os isotope system for basalts and peridotites was applied to identify their source. One of the major advantages using Re-Os system is that they are relatively immune to secondary effects, e.g., sea water alteration and mantle metasomatism. The Os isotope ratios of spinels separated from serpentinized peridotites which dredged from the Prince Edward fracture zone indicated more depleted signature than the mean value of abyssal peridotites (187Os/188Os=0.125). The time of Rhenium depletion (TRD) ages around 1Ga of these spinels show that these peridotites experienced melt extraction at least around 1Ga.

Keywords: ultra-slow spreading, Southwest Indian Ridge, Os isotope ratio