

An unusual Hf-Pb signature below the East Pacific Rise – Mathematician Hotspot system

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The Northern part of the East Pacific Rise (EPR), between the Riviera and Orozco Fracture zones shows an atypical morphology. It is 300m shallower than the rest of the ridge and is unusually wide. On its western side, a strong alignment of seamounts intersects perpendicularly the ridge in its most inflated part, suggesting a hotspot-ridge interaction.

This study reports new Hf and Pb isotopes and trace element concentrations for 57 MORB samples, collected by submersible 'Nautilé' during cruise PARISUB (2010). It covers a 15 km transect along the ridge axis from 15°37'N to 15°47'N with an average sampling of space ~300m.

REE patterns shows typical intermediate E-MORB compositions with relatively flat LREE profiles and significant depletions in HREE.

$^{206}\text{Pb}/^{204}\text{Pb}$ range from 17.5 to 18.2; $^{208}\text{Pb}/^{204}\text{Pb}=36.8-37.6$; $^{207}\text{Pb}/^{204}\text{Pb}=15.46-15.51$; $\epsilon_{\text{Hf}}=8.7-11.5$. All the Pb ratios over ^{204}Pb are correlated with each other, as well as with $^{176}\text{Hf}/^{177}\text{Hf}$. These clean correlations most likely reflect binary mixings occurring in the mantle source between the local DMM and enriched material (EM). $^{206}\text{Pb}/^{204}\text{Pb}$ and $^{208}\text{Pb}/^{204}\text{Pb}$ ratios are also unusually low even for MORB. They are actually the lowest values ever reported for the EPR, which is unexpected for a plume-ridge interaction. Moreover, alignments in $^{207}\text{Pb}/^{204}\text{Pb}$ vs $^{206}\text{Pb}/^{204}\text{Pb}$ or $^{208}\text{Pb}/^{204}\text{Pb}$ diagrams are distinct from any geochemical trend known for this ridge ($^{207}\text{Pb}/^{204}\text{Pb}$, too high for given $^{206}\text{Pb}/^{204}\text{Pb}$ and $^{208}\text{Pb}/^{204}\text{Pb}$).

The positive correlation between Hf and Pb isotopes is even more remarkable, that geochemical enrichments typically lead to radiogenic Pb and un-radiogenic Hf signatures and, therefore, that DMM-EM mixtures usually appear as negative correlations in the Hf-Pb isotope spaces.

The least radiogenic Hf and Pb correspond to the samples the closest to the Seamounts-ridge intersection (15°43'N) suggesting that these unusual compositions reflect the Mathematician EM material.

Interperetaion of microtexture and microstructure in the dynamic metamorphic rocks in Mouteh Mine area, Iran

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Introduction

The studied area is located in the central part of Sanadaj-Sirjan belt, 60 km south part of Delijan city, the Muteh mine area. The formations at this area are Devonian silicic volcanic and volcano clastic rocks that have been metmorphed at green schist –amphibolite facies. This rocks have altered by some Basic intrusive.

Methods and Results

Above 60 thin section have taken from drilling core samples. The aim of this studding is a interpretation of micro texture & microstructure by microscope. The result of studding show some micro texture like CS, C' fabric, Mineral Fish, Bookshelf Structure, Boudinage, Strain Shadow, σ , δ , Φ pyroclast. In addition we can find three metamorphism setting (D_1 , D_2 , D_3) at this area. Every one this micro texture & microstructure have made in various metamorphism and deformation setting.

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