Rare earth elements in marine sedimentary pore fluids

APRIL N ABBOTT[1], BRIAN HALEY[2], JAMES MCMANUS[3] AND CLARE REIMERS[3]

[1]CEOAS, Oregon State University, USA (aabbott@coas.oregonstate.edu)
[2]CEOAS, Oregon State University, USA (bhaley@coas.oregonstate.edu)
[3]CEOAS, Oregon State University, USA (mcmanus@coas.oregonstate.edu)
[4]CEOAS, Oregon State University, USA (creimers@coas.oregonstate.edu)

The rare earth elements (REE) are powerful geochemical tracers with a number of geochemical applications. Here, we present REE concentrations from sediment pore fluids extracted from cores taken from sites along the Oregon and California margins. Our sites represent continental shelf-to-slope settings, which lie above, within, and below the oxygen minimum zone of the Northeast Pacific. These sites are characterized by varying degrees of net iron reduction; the shelf sites are generally iron-rich (where near surface, pore water Fe concentrations can exceed 100 μM), whereas slope sediments generally have less-pronounced iron reduction zones that penetrate deeper into the sediments. REE concentrations show a shallow (upper 2-10 cm) subsurface peak across all sites (up to two orders of magnitude higher than sea water), and notably these peaks do not consistently coincide with peaks in dissolved iron. Normalized patterns of fourteen REEs show distinct and large variation in the MREE enrichments and HREE to LREE ratios with core depth. These REE pore fluid enrichments highlight the potential importance of continental shelf and slope sediments as a source of REEs to the ocean's water column.

Sr-Nd isotopic study of Papandayan area, West Java: Mapping the extent of Argoland beneath Java, Indonesia

M. ABDURRACHMAN[1]* AND M. YAMAMOTO[1]

[1]Bandung Institute of Technology,Bandung 40132, Indonesia (*correspondence: mirzam@gc.itb.ac.id)
[2]Akita University, Akita-shi 010-8502, Japan

Southern West and East Java have been suggested by several researchers as the "home" of micro continent since Late Cretaceous [1, 2, 3], uncertainty still remains as to whether the two fragments are linked forming part of a larger micro-continent. For this reason, Sr-Nd isotopic ratios of Papandayan and adjacent Cikuray volcanoes (Papandayan area) on the volcanic front in the Triangular Volcanic Complex (TVC) were employed to gain a better of tectonic development in Java. The eruptive product of Papandayan volcano comprises medium-K series with high $^{87}Sr/^{86}Sr$ (0.705243-0.705907) and low $^{143}Nd/^{144}Nd$ (0.512504-0.512650) ratios. The Cikuray volcanic rocks are in contrast to Papandayan, belong to low-K series, with low $^{87}Sr/^{86}Sr$ (0.704172-0.704257) and high $^{143}Nd/^{144}Nd$ (0.512823-0.512858) ratios. Our study shows that the contrasting Sr-Nd isotopic ratios in Papandayan area can be explained by the mixing of clear mantle wedge (I-MORB + AOC ± Indian Sediments) with Australian Granites as the missing "Argoland" which have separated from Western Australia in the Late Jurassic and collided to SE Sundaland in the Late Cretaceous [4]. We argue that the presence of "Argoland" beneath Southern West Java was responsible for Sr-Nd isotopic ratios diversity in Papandayan area as well as in TVC. Therefore, the suture zone should be laid between both volcanoes and Papandayan volcano probably is the only of Quaternary volcanoes which is underlain by "Argoland". If that so, the extension of East Java continental fragment can be continued to the West Java.

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