5.6.P04

Geochemistry of ultramafic and mafic rocks from the ophiolitic association of Kuznetsky Alatau ridge, SW Siberia

I. GERTNER AND T. KRASNOVA

Faculty of Geology and Geography, Tomsk State University, Tomsk, 634050, Russia (labspm@ggf.tsu.ru)

Ophiolites as spatially associated blocks of alpine-type hyperbasites, serpentinites, gabbro and subvolcanic mafites are localized along the main suture fault of Kuznetsky Alatau ridge. The previous geological setting, chemistry, REE patterns and U-Pb-isotopic data of subvolcanic rocks only are assumed a forming of whole association during the Vendian-Early Cambrian back-arc rifting. However some authors suggest that the ultramafic-mafic sequence is a result of magmatic differentiation in situ.

Ophiolitic fragments are separated in few arclike construction similar to Alaska-type complexes (ultramafites are in rims and mafites are in cores). Usually the mantle-crust transition zone is reduced by a late multistage deformation so the question about genesis of olivine-rich rocks is open often. A texture, chemical and mineralogical composition of this rocks allow to define more wide spreading metamorphic peridotites and dunites relative to ultramafic cumulates located in the contact with gabbroic bodies only. New geochemical data received by extremely calibrated ICP-MS technique for ultramafic and mafic rocks are confirmed this point of view.

Typical depleted ultramafites are presented as harzburgites and dunites that characterize a high magnesic olivine (Fo_{91-93}) and orthopyroxene (En_{91-92}), low concentrations of REE, Nb, Ta, Zr, Hf and Ti less to chondritic and primary mantle values. On the contrary ultramafic cumulates consist from more ferrous olivine (Fo_{87-89}) and pyroxene (En_{88-90}), contain higher concentrations of most trace elements, especially LREE, Ba, Th, U, Nb, Ta, Zr that similar to mineralogical and geochemical features of magmatic dunites from Proterozoic layered intrusions and komatiitic complexes of Siberia. Moreover a specific tendency of geochemical parameters is revealed in the rock sequence. Mantle ultramafites are characterized by a high level of differentiation for REE-patterns and multi-element spectrums with La/Yb, La/Sm, Nb/Ta, Zr/Hf and Ba/Y rations about 24, 10, 29, 49 and 33 correspondingly that gradually decrease to ultramafic cumulates (La/Yb ~ 16, La/Sm ~ 7, Nb/Ta ~ 27, Zr/Hf ~ 40, Ba/Y ~ 16) and to gabbroides (La/Yb ~ 7, La/Sm ~ 3, Nb/Ta ~ 19, Zr/Hf ~ 39, Ba/Y ~ 7). This anomaly trends can reflect a specific content of mantle source, fluid regime of melting and geodynamical setting of the Kuznetsky Alatau ophiolitic association forming in back-arc basins. Researches was funded by the Education Ministry of Russian Federation (grants UR.09.01.042 and E02-9.0-92).

5.6.P06

Isotopic evolution of Indian oceanic magmatism

N.M. SUSHCHEVSKAYA[1] AND B.V. BELYATSKY[2]

[1] Vernadsky Institute of Geochemistry RAS, Moscow, Russia (nadyas@geokhi.ru)

[2] IPGG RAS, St.Petersburg, Russia (boris@bb1401.spb.edu)

Among all the oceans of the Earth the Indian Ocean has the most complicated process of its formations, which is the reason of rather complicated structure of its bottom. Together with the structures formed in the process of spreading there are also the overprinted structures caused by further deformations. The peculiarity of the Indian Ocean is the presence of a great number of large volcanic formations such as Kerguelen Plateau, Chagos-Laccadive Ridge, Mascarene Plateau, East Indian Ridge (EIR) and Broken Ridge. The most ancient part of the ocean with the preserved crust of Late Jurassic age is situated in the West-Australian Basin between the Java trench and N-W coast of Australia. About 170 m.y. ago it was a part of the southern continental frame of the Tethyan Ocean which was spreading to the East. At the early stages of spreading in the eastern part of the Indian Ocean there were formed magmas mainly of tholeiitic composition with the features of differently enriched source. About 80 m.y. ago in the direction from the West to the East there had been formed the Konrad Rise, Aph.Nikitin Rise (ANR), Kerguelen, EIR, Naturaliste Plateau. EIR had the special structural position remind the modern structure of the Atlantic equatorial zone. Analysis of trace element and isotope signatures of the Queen Maud Land (QML) basalts connected with the influence of Karoo-Maud plume in Antarctica, which had preceded and determined the break-up of the Gondwana, rift magmatism of the early and modern stages and the magmatism of hot-spots discovered: **i)** difference of enriched components of the QML and Kerguelen traps; **ii)** similarity of the enriched tholeiites of the western SWIR frame (Spiess, Bouvet segment) with the QML basalts which can evidence spatial connection between Bouvet hot-spot and Karoo-Maud plume; **iii)** evidences of the enriched component within Cretaceous oceanic tholeiites of the ANR, Kerguelen and Naturaliste Plateaus, Broken Ridge differing from compositions of the magmas originated from shallow-level assimilation of plume- or ridge-derived melts by continental crustal material remained fragments of the Gondwanian lithosphere; **iv)** presence of specific component within the central part of the SWIR and it differs by low $^{206}Pb/^{204}Pb$ ratio (<17.0) which is absent in the SEIR; **v)** oceanic crust of the Eastern part of the Indian Ocean was formed during the spreading along the ancient SEIR. Eruption of enriched tholeiites could be connected with the involvement of the ancient metasomatized mantle in the melting and with its assimilation. Such an interaction gave rise to considerable enrichment in light TR, K, H_2O, U, Th.