A PRELIMINARY STUDY ON THE TRACE ELEMENT GEOCHEMISTRY OF BASALTIC ROCKS FROM THE TANGBALE OPHIOLITE IN THE WESTERN JUNGGAR, XINJIANG, CHINA, BY NAA

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The abundances and patterns of trace elements can provide useful informations on the sources and evolution of various types of rock and on their economic values in ore deposit prospecting. Such studies require a simple and accurate analytical technique for simultaneously determining trace elements in a large number of samples, INAA is one of the favorable methods.

Some exposures of basaltic rocks of Ordovician ophiolite are distributed in the southwestern part of western Junggar, including some pillow and massive laves associated with ultramafic rock bodies. In order to study the tectonic environment and origin of these rocks, the concentrations of several trace elements (Rb, Ba, Sr, Ni, Cr, Co, Zn, Sc, U, Th, Hf, Ta, Zr, and REE) have been measured in samples, The analyses have been made with instrumental neutron activation analysis with the accuracy of better than 5%.

On the basis of the REE geochemical behaviors, the basaltic rocks of the Tangbale ophiolite belt can be divided into three type. The rocks in the first type have total 8REE from 10.7 to 32ppm and chondrite normalized REE pattern is slight depletion of LREE and their (La/Yb)cn ratios range from 0.686 to 0.86. The REE patterns are consistent with the typical REE patterns of the mid ocean ridge basalt. The geochemical features of these rocks are typical of either N- type mid ocean ridge basalts or island arc tholeiites. The rocks in the second type have the total 8REE from 18.6 to 26.3ppm, their (La/Yb)cn ratios range from 1.34 to 1.85 and show a slight LREE enrichment, and are similar to those of the basalts in Lan Basin.The two type basalts show very slight fractionation and composition of basalts are rather close to the initial tholeiitic magmas.

The rocks in the third type have the highest REE content. Their chondrite normalized REE patterns are LREE strongly enriched type. These Calc-alkalic and alkalic volcanic rocks are the products of mixing magma which were formed by

contamination of the basaltic melt with crustal materials.

In Tangbale basalts, the normalized to chondrite average abundances of transition metal elements show strong depletion Cr and especial Ni, indicate that olivine was the predominant fractionating phase. The rocks of the first and the second have similar pattern, their Ti/V ratios remain constant of values (21.9 and 24.6 respectively) which are close to but lower than these of average of N-type MORB (36) suggesting that these two basalt types from Tangbale have a similar mantle source. According to diagram Zr/Y vs Zr (Pearce et al.,1980), melting degree of the upper mantle forming basaltic magma probably is 15%.

Tectonic setting of volcanic rocks determined using trace element abundances show that they were erupted in the back- arc basin. The volcanic rocks of the early and middle stages of the expanding period have low-REE and other incompatible element contents, their total content of 8 REE is 10.7-·32ppm,chondrite-normalized REE patterns are LREE depleted and LREE enriched type, there is a smaller negative Eu anomaly (Eu/Eu*=0.82-1.02).In late stage basaltic andesite or andesite were erupted in many place. Their chondrite- normalized REE patterns are LREE-strongly enriched type.Other incompatible elements are strongly enriched as well. These Calc-alkalic volcanic rocks are the products of mixing magma which were formed by contamination of the basaltic melt with crustal materials.

[1] Pearce A.J., Phil Trans. R. Soc Lond., A300,(1981), P299-317.

[2] Wood D. A., Earth and Planetary Science Letter, V.45 (1979) P.326-336.