Chemical composition of the basalts on east Pacific rise(1.5°N-1.5°S) and south Mid-ocean ridge(13.2°S)

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Revolutionary New Method

Chemical composition and process of magmatism in the mid-ocean ridge basalt are discussed by petrography mineralogy and geochemistry. Nb-Zr-Y diagram of basalt (Figure 1) can indicate the source area of basalt magma. Our results are shown in the figure below.

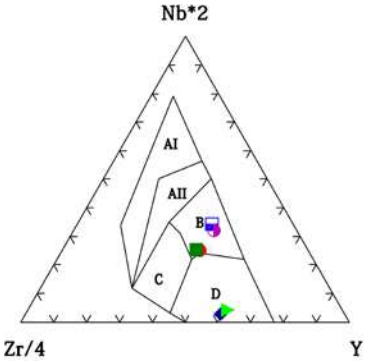

Figure1: Nb-Zr-Y diagram of basalt

Discussion of Results

Six samples of fresh basalts collected from the East Pacific Rise (EPR1.5°N and EPR1.5°S) and the South Mid-Atlantic Ridge(SMAR) have been studied in petrology and geochemistry. EPR basalts can be grouped into the categories of pyroxene basalt, vesicular basalt and tholeiitic basalt, and the SMAR are dominated by pyroxene basalt.

Major elements of basalt samples from the East Pacific Rise and south the Atlantic ridge indicate that the type of chemical composition are low-K tholeiite.

Both of the basalt of EPR1.5°N and SMAR, however, are enriched in LREE possibly due to the constraints of the mantle source (E-MORB). These basalts may be formed by the enriched mantle before partial melting or only having weak partial melting in the early stage of evolution. Basalts enriched in HREE possibly from the EPR1.5°S are normal mid-ocean ridge basalts from the typical depleted mantle (N-MORB) partially melted in early stage and the upper mantle magma was differentiated to certain extent. Differences in sources of the basalts at EPR1.5°N and EPR1.5°S illustrate that mantle is heterogeneous on the East Pacific Rise.