# Characteristics of MORBs from Southwest Indian Ridge near Atlantis II F.Z.

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The Southwest Indian Ridge (SWIR) is an ultraslow-spreading ridge with a 14mm/yr full spreading rate (Hosford, 2003). Atlantis Bank locates 100-km south of the SWIR. It was formed 13-9.5Ma (Dick et al., 1991). Vertical gabbroic succession attaining 1500m was drilled at Hole735B, during ODP Leg 118 & 176. After that, SHINKAI6500 and KAIKO dives have been done both extensive areas of Atlantis Bank and RTI (Ridge Transform Intersection). Various rocks from mantle to upper oceanic crustal rocks were recovered by these dives. Basalts and dolerites were recovered from Atlantis Bank and RTI located north of Atlantis Bank. Therefore, we can compare basalts formed 0 Ma and 13-9.5 Ma. 30 samples obtained from both areas were petrographycally described and analyzed by XRF, EPMA and ICP-MS. Based on these result, we discuss for difference between the basaltic rocks from RTI and Atlantis Bank.

1. Comparison of basalt from RTI and Atlantis Bank.

Basaltic rocks composed of aphiric basalt, plagioclase basalt, olivine basalt, olivine plagioclase basalt , dolerite, plagioclase dolerite and olivine plagioclase dolerite. Both basaltic rocks from RTI and Atlantis Bank show similar petrographic features in respect to the phenocryst assemblage. However, bulk rock compositions from both areas are slightly different from each other. K2O, TiO2, P2O5, Na2O and Zr contents of the basaltic rocks from the RTI are higher than those of Atlantis Bank. Furthermore, they show different trend in many variation diagrams.

Model calculations for fractional crystallization and partial melting degree suggest that the diversity of basalt compositions of RTI and Atlantis Bank is not explained by a simple fractional crystallization. Also, this suggests that the basaltic rocks of RTI are derived by lower degree of partial melting than those of Atlantis Bank. But, compositions of Atlantis Bank show large range and differ from place to place, suggesting heterogeneity of source mantle.

2. Features of Southwest Indian Ridge MORB.

Using major and trace elements, many discrimination diagrams have been proposed. However the present basaltic rocks don't plot on N-MORB fields in several discrimination diagrams. This suggests that the present MORBs have different composition from general N-MORB. As compared with REE patterns, the present MORBs show roughly N-MORB pattern but are distinct from E-MORB. But, the present MORBs have convex-shaped patterns in which MREE shows much higher concentration suggesting that the mantle source of this MORB is different from general N-MORB.

Almost discrimination diagrams are based on MORBs from the Pacific Ocean (EPR) and Atlantic Ocean (MAR), and data from Indian Ocean are not used. When considering the genesis of ophiolites which are related to Indian Ocean, we should be careful to apply such discrimination diagrams.