

## Magma process of the uppermost mantle beneath an ultraslow-spreading ridge: an example from Southwest Indian Ridge

# Shoji Arai[1], Kumiko Hara[2], KR00-06 Scientific Party Arai Shoji

[1] Dept. Earth Sci., Kanazawa Univ., [2] Dept. Earth Sci., Kanazawa Univ.

<http://kgeopp6.s.kanazawa-u.ac.jp/Arai/>

Deep-seated rocks are exposed on the slope along the Atlantis II fracture zone of Atlantis Bank, Southwest Indian Ridge. We examined peridotites recovered from the uppermost mantle portion to clarify the deep magmatic process beneath an ultraslow-spreading ridge.

Spinel lherzolite is generally present but plagioclase-spinel lherzolite is predominant just beneath the Moho. Spinel harzburgite with 1 % plagioclase was also found. Plagioclase is highly anhedral and is associated with chromian spinel. The volume of plagioclase is not correlated with that of pyroxenes and chromian spinel. Cr# of spinel increases from 0.15 to 0.4 and Mg# of olivine (or opx) decreases from 90.5-90.8 to 90.2 with an increase of plagioclase volume. Harzburgite has Mg# (opx) of 91 and Cr# (spinel) of 0.5. Lherzolite just beneath the Moho rarely has veins of Fe-rich gabbro to pyroxenites, which have apatite, zircon, phlogopite and kaersutite.

Spinel lherzolite is possibly a residue of MORB extraction at an ultraslow-spreading ridge. Upper plagioclase-bearing peridotites may have been derived from near the melt conduit beneath the axis, and are a kind of residue of various extent of melting assisted by melt flux. Dunite or troctolite may be present around the Moho, ultimately derived from former melt conduit. The Fe-rich gabbro and pyroxenite was formed by downward injection of evolved MORB.

The sub-oceanic upper mantle is generally composed of lherzolite, harzburgite and dunite upward, being independent of spreading rate. The grade of lithological variation is, however, strongly dependent on the spreading rate; being gradual for the fast-spreading ridge and steep just beneath the Moho for the slow-spreading ridge.