Japan Geoscience Union Meeting 2013
(May 19-24 2013 at Makuhari, Chiba, Japan)

SEM36-04 Room:201B Time:May 19 09:45-10:00

Rock magnetism of the volcanic materials recovered from Louiville Seamounts during IODP Expedition 330

Yuhji Yamamoto[1*], Toshitsugu Yamazaki[2], Hiroyuki Hoshi[3]

[1]Center for Advanced Marine Core Research, Kochi University, [2]Atmosphere and Ocean Research Institute, University of Tokyo, [3]Aichi University of Education

Integrated Ocean Drilling Program (IODP) Expedition 330 recovered volcanic materials from seamounts along the northwestern part of the Louisville hotspot track (50-74 Ma). The recovered materials include basalts which are considered to be erupted under subaerial or shallow submarine conditions. We have been trying absolute paleointensity measurements on them, and we in parallel have studied rock magnetic properties to assess the paleointensity results. In the present study we mainly focus on thermomagnetic properties.

Thermomagnetic analyses using a magnetic balance (Natsuhara Giken NMB-89) in vacuum condition have been made on 57 rock chips from Site U1372, 28 chips from Site U1373, 140 chips from Site U1374, 44 chips from Site U1376, and 19 chips from Site U1377 (288 chips in total). The resultant curves can be classified into the five types (A, B, C, D, and E).

Type A: almost reversible thermomagnetic curves observed in 38 specimens. They show a single phase of Ti-poor titanomagnetite with Tc (Curie temperature) higher than ~ 500 degC.

Type B: almost reversible thermomagnetic curves recognized in 18 specimens. The difference from type A curves is existence of Ti-rich titanomagnetite phases with Tc lower than ~ 500 degC, in addition to the high Tc (> ~500 degC) phase.

Type C: somewhat irreversible thermomagnetic curves found in 49 specimens. They show a single phase of Ti-poor titanomagnetite with Tc higher than ~ 500 degC, however, cooling curves result in reduction in induced magnetization relative to heating curves in most cases. At ~ 50 degC, amount of the reduction is about 20-60 percent.

Type D: irreversible thermomagnetic curves seen in 50 specimens. They are usually characterized by two phases of titanomagnetite, one with moderate Ti content (Tc ~ 150-300 degC) and the other with low Ti content (Tc > ~ 450 degC). Cooling curves outweigh heating curves in most cases.

Type E: irreversible thermomagnetic curves occurred in 133 specimens. They exhibit relatively low Tc (~ 200-300 degC) components followed by bumps of high Tc (~ 400-500 degC) in heating curves. The bumps are considered to originate from inversion of titanomaghemite. Cooling curves outweigh heating curves in most cases.

Some of the selected specimens will be analyzed using scanning electron microprobe and other instruments. We will report these results together with the thermomagnetic ones.