

Change of TRM and ARM caused by laboratory heating

Naoyuki Komuro[1]; # Hidefumi Tanaka[2]

[1] Education, Kochi Univ.; [2] Education, Kochi Univ

<http://home.cc.kochi-u.ac.jp/~htanaka/>

Chemical alteration of rock magnetism often occurs when a volcanic rock is heated in laboratory. In the Shaw paleointensity method, change of TRM capacity is corrected by the difference of two ARMs which are induced before and after the heating. Although the grain size dependency of TRM and ARM is not identical in a strict sense, the correction by ARM is practically a powerful method. This study aims to study the coherency of changes of TRM and ARM when a volcanic rock is heated in laboratory, and elucidates a practical applicability of ARM correction in the Shaw method.

Four volcanic rocks used are an andesitic pyroclastic flow (AS03), glassy part of andesite lava (OT57), an andesite lava (OT58), and a basalt lava (MY07). Two samples were prepared from each flow and each of them were treated separately in air and vacuum of about 5 Pa. After initial measurements of a progressive AF demagnetization of NRM and ARM0, TRM and ARM were similarly measured after successive heatings of 10, 20, 50, 100, 200, and 500 minutes. Small sister tip samples were also included in the furnace to measure the hysteresis parameters after each heating. Measurements of remanences and rock magnetism were made by dSpin2 and VSM respectively at the Kochi University Marine Core Center.

In the experiments of OT57 which is close to SD nature, almost no change was observed in TRM and ARM in both atmospheres. OT58 samples, which are close to MD nature, suffered a drastic change of TRM and ARM during heating in air. Change of TRM and ARM are coherent enough to restore the altered TRMs to a corrected TRM*by the change of ARM. However, the rate of change is different for different coercivity windows, giving concave down NRM-TRM*curves. Less intense but similar results with opposite sense were observed for OT58 when the sample was heated in vacuum. For other two samples, change of TRM and ARM were small to moderate and their coherency was quite good if the change of +/-10% is allowed. Details and implications of the results will be discussed.