

Rockmagnetism of submarine basaltic rocks from IODP Site C0012

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The IODP Expeditions 322 & 333 penetrated sediments-basement boundary and recovered successive cores at Site C0012 situated on a topographic high named Kashinosaki Knoll. The collected basement samples are composed of alternating beds of pillow basalts and hyaroclastite and were retrieved by rotary core barrel drilling system. Paleomagnetic measurements on basaltic basement rocks from Site C0012 show that the stable magnetization has reversed polarity. Rock magnetic experiments were conducted to understand the magnetic minerals contributing to the primary magnetization. Thermomagnetic curves during heating in air shows a hump around 500degC which cannot be seen for the curve in vacuum, Ar or He atmosphere. This can be interpreted as a result of oxidation of the magnetic mineral. The results in air, vacuum, Ar and He show maximum curvatures at 326degC, 332degC, 328degC and 303degC, which might show a Curie temperature of the natural magnetic mineral (titanomaghemite). The peaks at around 402degC, 392degC and 424degC in vacuum, Ar and He might correspond to break down (decomposition) of magnetic minerals (titanomaghemite) by heating. A hump at 493degC for the heating curve in He could not be resolved enough in the heating curve up to 527degC. This might be a result of the multiple heatings and heating rates, which suggest the progressive production of titanomagnetite (from titanomaghemite) and subsequent hematite production (reduction in magnetization intensity). Low-temperature magnetic measurements were also conducted and will be interpreted together with Curie temperatures.

Keywords: rock magnetism, submarine basalt, low temperature magnetometry, Curie temperature, Kashinosaki Knoll