Geophysical Research Abstracts, Vol. 8, 07884, 2006
SRef-ID: 1607-7962/gra/EGU06-A-07884

Crustal magnetization and magnetic petrology from the IDDP-drilling RN-19 and its surrounding on the Reykjanes peninsula, Iceland

F. Dietze (1), A. Kontny (1), **C. Vahle** (1) and H. Audunsson (2)

(1) Geological-Paleontological Institute, Ruprecht-Karls University, Im Neuenheimer Feld 234, D-69112 Heidelberg, Germany, (2) Technical University of Iceland, Hofdabakka 9, 110 Reykjavik, Iceland

(agnes.kontny@urz.uni-heidelberg.de)

The Reykjanes high-temperature system is located at the boundary where the submarine Reykjanes Ridge passes over into the rift zone of southwestern Iceland. Surface geology is characterized by the historic Stampar fissure eruption from 1226, a picritic lava shield and intercalated pillow basalt - hyaloclastite ridges probably formed during the last glacial episode (14.5-20 thousand years). The geothermal field, which coincides with a magnetic low in the aeromagnetic anomaly map, is situated within a dense NE-SW fissure and fault zone. Within the frame of IDDP, a 3 m drill core was recovered from a depth of 2245-2248 m of the RN-19 borehole in May 2005, which entirely consists of a dense dolerite intrusion. Different rock magnetic and magnetomineralogical investigations were carried out on the different volcanic surface rocks from three profiles across the peninsula and the drill core. Natural remanent magnetization is between 2.5 and 33 A/m with high values in the youngest flow. Within this young flow, scoria shows distinctly higher NRM and magnetic susceptibility (k) values than massive and vesicular basaltic lava. The high NRM coincides with the magnetic high, while samples from flows of older age with lower NRM and k occur within the area of magnetic low. Koenigsberger (Q) ratios are high (17 - 132) for all surface samples, indicating that the remanent magnetization dominates. The doleritic dike sample from the RN-19 borehole shows distinctly lower NRM values (about 6 A/m) and higher k values (about 30 x 10E-03 SI) resulting in Q ratios below 10. First temperature-dependent magnetic susceptibility data indicate a homogeneous titano-

magnetite with Tc at about 60˚C, pure magnetite (Tc = 580˚C) and an irreversible titanomaghemite with a Tc at about 450˚C in the area of the magnetic low. The occurrence of magnetite and the low-temperature behavior of kT curves below –150˚C indicate exsolution textures typically forming during high-temperature oxidation. Titanomagnetite in the scoria of the young flow shows a higher Tc of about 240˚C and for titanomaghemite a Tc of about 440˚C. Our observation that high crustal magnetization is related to the youngest flow along the rifting axis is in agreement with observations of the central anomaly magnetization high from mid-ocean ridges (e.g. Schouten et al. 1999). The magnetization process in the scoria will be further studied.

Schouten, H., Tivey, M.A., Fornari, D.J., Cochran, J.R. (1999): *Earth and Planetary Science Letters*, 169, 37-50.