

Magnetic anisotropy of pseudotachylyte in the Mt. Riiser-Larsen area, Enderby Land, East Antarctica

Itoyuki Nishioka[1]; Naoto Ishikawa[1]

[1] Graduate School of Human and Environmental Studies, Kyoto Univ.

Fault related pseudotachylyte remains difficult to analyze its rheological behavior using conventional microscopic observation because the matrices are generally very fine grained and do not show clear foliation or lineation. In order to assess the possibility of magnetic approach as a method of structural analyses, we studied the anisotropy of magnetic susceptibility (AMS) and anisotropy of isothermal remanent magnetization (AIRM) in pseudotachylyte in the Mt. Riiser-Larsen area, East Antarctica. 15 samples were collected from the fault vein and 6 samples from the wall-rock gneiss. The pseudotachylyte can be characterized by the weak low-field susceptibilities on the order of 10^{-8} m³/kg. Powder X-ray diffraction analysis and microscopic observations revealed orthopyroxene microlites as main paramagnetic minerals, controlling AMS of the pseudotachylyte. Demagnetization of a composite IRM shows the presence of the main magnetic mineral with relatively high saturation field of 1 T and the maximum unblocking temperature around 300 °C. The AMS and AIRM analyses yield magnetic foliations sub-parallel to each other, which lie oblique to the plane of the fault vein. The magnetic foliations are consistent with microscopic foliations defined by elongate lithic clasts and flow textures in the matrices. The AMS and AIRM fabrics are, thus, suggested to reflect primary structures associated with the generation of the pseudotachylyte.