Ref.#: Ge_9

kdudzisz@igf.edu.pl

ABSTRACT

Magnetic properties of the Early Triassic rocks of Hornsund area, Spitsbergen: preliminary results

Katarzyna Dudzisz[1] Rafał Szaniawski[1] Krzysztof Michalski[1]
[1]*Institute of Geophysics Polish Academy of Sciences - Centre for Polar Studies KNOW (Leading National Research Centre), Magnetism Department, Poland,*

Studies were carried out in the Vardebukta Formation (Early Triassic) from Cenozoic West Spitsbergen Fold-and-Thrust Belt (WSFTB). Rock samples were collected from 12 sites situated along the belt of Early Triassic outcrops reaching from northern Sørkapp Land to the area of Polakkfiellet. Magnetic properties of rocks were studied by applying different rock-magnetic methods, including: thermal demagnetization of saturated isothermal remanent magnetization (SIRM), hysteresis loops and the analysis of magnetic susceptibility variations at high temperatures. Subsequently anisotropy of magnetic susceptibility (AMS) was investigated followed by analysis of the natural remanent magnetization (NRM), using both thermal and alternating field (AF) demagnetization. The obtained outcomes show that magnetite and pyrrothite are main carriers of the magnetic information. There are significant discrepancies between sites in terms of magnetic susceptibility values (20 – 400*10^{-6} SI). AMS studies revealed that studied rocks have different types of magnetic fabric. In most of sites, we observed bedding parallel to both the inherited form of the magnetic foliation and the sedimentary mineral alignment, together with relatively good clustering of maximum AMS axes, which was caused by the tectonic strain. The orientations of such magnetic lineation and thus orientation of the maximum tectonic strain is roughly consistent with the regional structural trend of the WSFTB. Conversely, the two studied sites show intermediate and inverted fabric. The inverse magnetic fabric can be carried by many minerals, such as tourmaline, cordierite, iron-bearing carbonates and goethite. In the investigated rocks, the presence of single-domain magnetite grains originated from secondary mineralization is highly probable. These Early Triassic rocks record several NRM components with partially overlapping unblocking temperatures in the range of 425 – 500°C. We conclude that many NRM components might result from the remagnetization related to folding and the formation of the WSFTB orogen.