

## Meta-igneous Rocks from South-Western Oscar II Land (Western Spitsbergen) and their Usefulness in Palaeomagnetic Investigations

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### Abstract

In this study, more than 200 oriented cores were selected for palaeomagnetic investigation of six metaigneous and one metacarbonate sites from metamorphic Proterozoic – Lower Palaeozoic complex of South-Western Oscar II Land (Western Spitsbergen). Additionally, a comprehensive set of petrological, structural and rock-magnetic methods were applied to obtain detailed information about ferromagnetic carriers and their origin. To increase the resolution of the petro-magnetic data, standard “whole rock” analyses were enhanced by experiments conducted on Fe-containing separates. The results revealed that all primary magmatic ferromagnetic phases of the meta-igneous rocks has been completely replaced by remineralization related to Caledonian (*sensu lato*) and younger metamorphic events. The dominant ferromagnetic carriers are representing by low/medium coercivity fraction such as pyrrhotite and Ti-magnetite/maghemite. The examination of separated magnetic phases allowed to accurately pointed out ferromagnetic carriers and connected them with particular tectono-thermal stages of investigated rocks. Multiphase metamorphic history of the region corresponding to the complex pattern of the natural remanent magnetization (NRM) of meta-igneous rocks. Obtained palaeomagnetic directions demonstrated no convergence with reference path of Laurussia for syn- to post-Caledonian time. However, the same trend of shifting the palaeomagnetic directions to the east was observed almost in all meta-igneous sites. Similar behavior was noted during previous investigations conducted on other meta-igneous sites from Oscar II Land. To explain this phenomenon several tectonic models were proposed. Our conclusions will be useful for further palaeomagnetic and petrographic interpretations of this region.

**Keywords:** palaeomagnetism, Caledonian metamorphism, Western Spitsbergen.

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