

Field-reversal versus self-reversal hypothesis: Paleomagnetic properties, magnetic mineralogy and the reproducible self-reversal PTRM of the Neogene volcanics from the East-Slovak Lowlands, Zemplínske vrchy Mts., and the Slánske vrchy Mts. (Part VI)

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Abstract: Paleomagnetic properties, magnetic mineralogy and an origin of the reversed remanent magnetization (RM) of andesitic rocks from the East-Slovak Lowlands, Zemplínske vrchy Mts., and the Slánske vrchy Mts., were studied. The reproducible self-reversal partial thermoremanent magnetization (PTRM) of andesitic samples was induced. Only rocks with the ilmenite-hematite (Ilm-Hem) phase of $T_{C1} \approx 540\text{--}570^\circ\text{C}$ (within the compositional range of Ilm₁₅ to Ilm₂₅) with the metastable phase, including the disordered phase are able to be self-reversally magnetized during magnetizing process in the laboratory field of normal polarity. The rocks having only completely ordered or disordered magnetic phases are not able to acquire the self-reversal PTRM. Andesitic rocks of the East-Slovak Lowlands, Zemplínske vrchy Mts., and the Slánske vrchy Mts., originated in the Middle-Late Badenian to the Late Pannonian time. The mineralogical differences in andesitic rocks, but particularly the reproducible laboratory induced self-reversal PTRM of large number of rocks indicate the self-reversal origin of the reversed remanent magnetization of rocks. This is the most convincing proof of the self-reversal origin of the reversed RM of andesitic rocks under study. The results indicate at the same time that the geomagnetic field was not reversing its polarity during the delineated time interval.

Key words: In-situ magnetic phases, annealed magnetic phases, Ilm-Hem a carrier of the self-reversed RM, the reproducible self-reversed PTRM of rocks

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