Field-reversal versus self-reversal hypothesis: Paleomagnetic properties, magnetic mineralogy and the reproducible self-reversal PTRM of the Neogene andesites from the Kremnické vrchy mountain range (Part V)

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A b s t r a c t : Paleomagnetic properties, magnetic mineralogy and an origin of the reversed remanent magnetization (RM) of andesitic rocks from the Kremnické vrchy mountain range were studied. Only rocks with the Ilm-Hem phase of $T_{C1} \approx 540$–570°C (either original, or newly created during an oxidation of original Ti-Mt) 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-reversed PTRM in the laboratory field of normal polarity. They acquire the TRM or the PTRM of only normal polarity. The reproducible self-reversed PTRM of the 31 samples of rocks (from 31 localities) was induced. This is the most convincing proof of the self-reversed origin of the reversed RM of andesitic rocks under study. Andesitic rocks of the Kremnické vrchy mountains originated in the time of the Upper Badenian to the Middle Pannonian age (15.5–9.5 M.Y.). According to *Harland et al. (1982)* the geomagnetic field changed its polarity 16 times during 15.5–9.5 M.Y. The mineralogical differences in andesitic rocks, but particularly the reproducible laboratory induced self-reversed PTRM of large number of rocks indicate the self-reversal origin of the reversed remanent magnetization of rocks. The results indicate at the same time that the geomagnetic field was not reversing its polarity during the delineated time interval. Magnetites (Mt; cubic phase), homogeneous, or quasi homogeneous titanomagnetites (Ti-Mt; cubic phase) and hematite (He; rhombohedral phase) are the carriers of normal RM in the andesites. The Ilmenite-hematite solid solutions (Ilm-Hem) of the compositional range of $Ilm_{15}hem_{85}$ to $Ilm_{25}hem_{75}$ are the carriers of the self-reversed RM in the andesites.

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

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