

Field-reversal versus self-reversal hypothesis: Paleomagnetic properties, magnetic mineralogy and the reproducible self-reversal RM of the Neogene andesites from the Javorie and Poľana mountain range (Part III)

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Abstract: Paleomagnetic properties, magnetic mineralogy and origin of the reversed remanent magnetization (RM) of andesitic rocks from the Javorie and Poľana mountain range were studied. 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 (Ilm-hem) solid solutions of the compositional range Ilm_5 to Ilm_{12} , or $\text{Ilm}_{15}\text{hem}_{85}$ $\text{Ilm}_{18}\text{hem}_{82}$ are the carriers of the self-reversed RM in the andesites. The reproducible self-reversed partial thermoremanent magnetization (PTRM) of the 43 samples from 43 localities was induced in the temperature interval of 630°C to 590°C in field of intensity $H = 0.048$ mT. The carrier of the self-reversed RM in the andesites under study is the magnetic phase of the $T_C \approx 595$ to 625°C (or of the $T_C \approx 550$ to 625°C). The mineralogical differences, namely the laboratory induced self-reversed PTRM of mass number of rocks indicate the self-reversal origin of the reversed RM of rocks. The studied andesitic rocks originated in the Badenian to the Middle or Lower Sarmatian age (16.05–12.9 M.Y.). According to *Harland et al., (1982)* the geomagnetic field has changed its polarity twelve times, during this period. The results indicate that the geomagnetic field was not reversing its polarity during the delineated time interval. It persisted only in the positive direction and the dynamics of the field was probably similar to that which has been registered in the observatories from 1540 year to the present. The declination of the field changed in the range of about 35° and the inclination of the field changed in the range of about 10.0°. No excursions of the field from one polarity to other one, or the change of polarity of the geomagnetic field from positive to reversed polarity existed in the above delineated geological history.

Key words: 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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