Field-reversal versus self-reversal hypothesis: The Ti-rich titanomagnetite bearing basalts and their partly self-reversed partial thermoremanent magnetization induced in the laboratory field

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A b s t r a c t : Three Ti-rich titanomagnetite bearing samples were subjected to inducing of the thermoremanent magnetization in the laboratory field of normal polarity and the intensity of about H= 50 μT. The high vacuum of about 10^{-4} to 10^{-5} Torr., was used during heating and cooling of the samples, to prevent an oxidation of original Ti-Mt-es. The original basalt and two artificial samples acquired intense PTRM, and an orientation of the total vector of the PTRM was antiparallel (reversed) with respect to the H component of the magnetizing field, but the inclination of the PTRM was of positive sense. The results have proven that in all three samples only non-complete, partly self-reversed PTRM was acquired during the laboratory inducing in the field of normal polarity. The original Ti-rich titanomagnetites were partly oxidized, despite the highly evacuated space, which is the primary cause for a non-complete self-reversal magnetization of samples during the experiment.

Key words: superparamagnetic-like state of high content of ulvöspinel titanomagnetites, partly self-reversal PTRM of Ti-rich Ti-Mt bearing basalts

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