Study of the Ti-Mt phases of the artificial samples: The contribution to the solution of the source of the intense RM of volcanic rocks

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Abstract: The laboratory acquired detrital remanent magnetization (DRM) was studied on the artificially prepared titanomagnetite (Ti-Mt) containing samples. The titanium-rich Ti-Mt-es are able to acquire only very low values of DRM, despite the natural basalts possessed extremely high values of magnetic susceptibility (κ). The Q ratio has attained the values of about 0.5 to 6.0. This fact has proven an idea about the superparamagnetic SP-like behaviour of the titanium rich Ti-Mt-es. Similar SP-like behaviour have shown the samples with the non-completely developed low-temperature oxidized Ti-Mt phase. Natural basalts of this group have relative low values of κ and Q ratio. The highly-temperature oxidized Ti-Mt-es carry very high intensities of DRM so the derived Q-ratio is also high. The stability of DRM of highly oxidized Ti-Mt-es against the thermal effect is relatively high, comparable with the stability of NRM natural basaltic rocks. From the experimental works it has followed that intensity and stability of RM depend on the domain state of Fe-Ti oxides, so there have been involved also some comments about the domain structures of the titanium-rich Ti-Mt-es in this article.

Key words: the Ti-rich and oxidized titanomagnetites, artificial samples, the sources of viscous remanent magnetization of rocks

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