Archeomagnetic studies of fired ceramics from Sakhtysh-I and Sakhtysh -II settlements (Ivanovo Region, Russia)

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With the goal to obtain new data of geomagnetic field intensity in the Bronze Age in the Eastern Europe the arheomagnetic study of fired ceramic samples from the settlements Sakhtysh-I and Sakhtysh -II were done. The settlements Sakhtysh-I and Sakhtysh -II are placed in Teikovo district of the Ivanovo region of Russia (56°48’ N, 40°33’ E). Archeological excavations of ancient ceramics were carried out by the Upper Volga Archeological Expedition of the Institute of Archeology RAS. The studied collection of pottery fragments belongs to three cultures: the Fatyanovo, the Fatyanoid (or the Fatyanivo-like) and the Textile ceramics culture. The composition of the ferromagnetic fraction presented in the studied archaeological samples have been performed by the complex of standards petromagnetic methods. The thermomagnetic analysis (TMA) in dependence of the saturation magnetic moment on temperature and determination of the Curie points were carry out. Thus based on TMA one can conclude that the main carrier of the magnetisation of the samples is relatively resistant to heat maghemite. The size of grains lies in a pseudo single domain area. The determination of the ancient magnetic field intensity was carried out by modified Thellier method. Based on the carbon-isotope dating the age of pottery fragments corresponds to the ~ 2000-700 years BC, and we can construct a curve of paleointensity variations of the geomagnetic field from the age. The data obtained for this period can provide new information about variations of the geomagnetic field intensity during the Bronze Age, which will make it possible to specify the character of changes in geomagnetic field. Earlier for the time interval II millennium BC a certain amount of the geomagnetic field intensity data were obtained in the Russian Plain region. Due to the uncertainty of the dating, these data allowed us to evaluate only the general features of geomagnetic field intensity variations. Rapid sharp changes in field intensity occurred with an increase in the average level of the field intensity compared with the level in the previous two millennia. This work was supported by the Russian Foundation for Basic Research, project no. 19-55-18006 and the State task of the Schmidt Institute of Physics of the Earth RAS.

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