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Lacustrine sediments variability on the base of magnetic properties of lake Kandrykul

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The work is devoted to the study of the magnetic parameters of Kandrykul lake sediments. The main aim of this investigation is to identify the events and trends of environmental and climate factors changes in the Late Quaternary.

The objects of research is located in Bashkortostan republic (54°30'10" N 54°03'50" E).

According to previously seismoacoustic studies, 4 core columns were taken. The total number of samples for Lake Kandrykul was 659 (the length of column varies from 378 to 524 cm).

For a detailed complex analysis, core No. 3 was selected according of the primary lithological description and the results of seismoacoustic studies.

The detailed complex analysis included the measurements of magnetic susceptibility and natural remanent magnetization, coercive spectrometry, differential thermomagnetic analysis.

Magnetic susceptibility was measured using a Multifunction Kappabridge MFK1-FA (AGICO). Natural remanent magnetization was carried out at the Resource Center "GEOMODEL", Scientific Park of Saint-Petersburg State University. Hysteresis parameters were obtained using the J_meter coercitive spectrometer, and it allows to make separate measurements of the remanent and induced magnetizations in magnetic fields up to 1.5 T at room temperature, induced magnetization versus temperature. Differential thermomagnetic analysis was carried out for tracing magnetic minerals according their Curie temperature. Measurements were carried out on Curie express balance. The temperature dependence of induced magnetization in air at a heating rate of 100 °C/min up to a maximum temperature of 800°C were measured in a constant magnetic field - 400 mT.

Normal magnetization curves were used to determine the hysteresis parameters, the domain structure and ferrimagnetic grain sizes, as well as the contribution of para-, ferro- and superparamagnetic components to the total magnetic susceptibility.

Magnetic susceptibility varies between $(0.54 - 21.94) \cdot 10^{-7} \text{ m}^3/\text{kg}$ for all cores. The values of natural remanent magnetization changes from $(0.099-302.41) \cdot 10^{-3} \text{ A/m}$. Almost all magnetic fractions are presented by pseudo-single domain particles, according hysteresis parameters. According to

differential thermomagnetic analysis magnetic minerals in sediments presented by iron sulfides and magnetite.

The results of magnetic-mineralogical investigations made it possible to reveal the features of climatic and other environmental changes on the studied lacustrine sediments.

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