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Development of XRFA-SR method with the hard X-ray (65 keV) range for paleoclimate reconstruction (Lake Baikal region) on the storage ring VEPP-4M

Content

The Selenga River is the main inflow of Lake Baikal and its suspended material penetrates away into the lake. The catchment of the Selenga River is 447000 km² and water content of the river is a proxy of moisture of the south part of East Siberia and the Northern Mongolia. In this reason, studding of geochemical pattern of bottom sediments of Lake Baikal we can reconstruct water content of the Selenga River in the past.

The analysis of bottom settlings by the scanning X-ray fluorescence spectrometry method (SR-XRF scan) is carried out in the context of paleoclimate research.

All measurements were carried out on the station of XRFA-SR on the storage ring VEPP-4M. The work was done using the infrastructure of the Shared-Use Center “Siberian Synchrotron and Terahertz Radiation Center (SSTRC)” based on VEPP-4M of BINP SB RAS. The work was supported by The Ministry of Education and Science of The Russian Federation (project RFMEFI62117X0012). The conditions of VEPP-4M were the following: $E_e = 4.5$ GeV, SR beam from 9-pole wiggler with $B = 1.9$ T, and $I_e = 20$ mA. The excitation energy for the determination of concentrations in practically all bottom sediments was 65 keV. The new XRFA-SR station on the storage ring VEPP-4M allowed to move to a new level of research on paleoecological reconstructions, by increasing the number of chemical elements. The work is supporting by the RFBR grant No. 17-29-05016.

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