2.6.P03

Sedimentary Fe and Mn cycling in Lake Baikal

L.Z. GRANINA, I.B. MIZANDRONTSEV, V.V. PARFENOVA AND YU.R. ZAKHAROVA

Limnological Institute SD RAS, Irkutsk, P.Box 4199, Russia, (liba@lin.irk.ru)

In Baikal, the water column is constantly enriched throughout with oxygen, which penetrates into sediments over most of the bottom. To describe the diffusion sediment oxygen penetration (SOP), the parabolic equation was proposed that fits well with the measured SOP profiles. Software is developed, which allows calculating oxygen gradients at the water-sediment interface, oxygen flux across the bottom surface, aerobic destruction of sedimentary organic matter, and amount of the resulted energy evolved. This energy is taken up during the oxic stage of early diagenesis. Opposite to most of the lakes, oxic stage of diagenesis is widely presented in Baikal. There are different forms of secondary Fe and Mn diagenetic formations including layers highly enriched in Fe and Mn, Fe/Mn crusts and nodules. Accumulation and remobilization of Fe and Mn in the surface sediments were studied at contrasting sedimentary environments of Lake Baikal [1]. The results allow distinguishing two types of Fe and Mn diagenesis in the areas of relatively high sedimentation (type I) and in the regions of low sedimentation rates (type II). They are characterized by different parameters (time of accumulation, Fe and Mn contents, enrichment factors, etc.) as well as by predominance of allochthonous (type I) and autochthonous (type II) origin of Fe and Mn accumulations. The first studies of the Fe and Mn oxidizing bacteria performed in the areas, characterized by different conditions of sedimentation showed that bacteria, identified as genus *Leptothrix* and genus *Galionella,* exist in the sediments with the maximum concentration up to 1500 cells/g. Their abundance and the pattern of distribution are closely related to the content of particulate and pore water Fe and Mn, which, in turn, are controlled by the redox conditions. The results obtained have firstly demonstrated a biogenic nature of diagenetic Mn accumulation in sediments of Lake Baikal. The work was supported by RFBR grant 03-05-65255.

References

[1] Granina L., Müeller B., Wehrli B. *Chem. Geology*, in press.