

## **Biom mineralization in peat and sapropel at the Baikal region**

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Living matter is a small part of the Biosphere, but it plays an exceptional role in geological processes associated with the transformation of the “face” of our planet (Vernadsky, 1926). Almost 90 years ago, Vladimir Ivanovich Vernadsky, who was an outstanding Russian scientist, philosopher, social leader and a founder of geochemistry, hydrochemistry, biogeochemistry and radiogeology, created the holistic doctrine of the Biosphere where he demonstrated the primacy of life as a geological force. Concentrative function of living matter plays a significant role in biom mineralization, which is the process when living organisms assemble structures from naturally occurring inorganic compounds (Leadbeater B.S.C. and D.A.N. Barker, 1995).

The purpose of this work was to investigate biom mineral formation in peat and sapropel and show an important role of living matter in element accumulation. The objects were peat of the Vidrino highmoor (south-east of the Baikal region, Russia) and sapropel of Duhovoe lake (east of the Baikal region, Russia).

The high concentrations of Zn and Cu (up to 3000-2000 g/t) were determined in peat of the Vidrino highmoor in the layers of early Holocene (360-440 cm) which were formed in period 11 - 8.5BP. It was shown that authigenic sulfides of Zn and Cu with micron dimension (0.5-3  $\mu\text{m}$ ) were formed in the plant cells of sphagnum. Also particles of native silver (5-7  $\mu\text{m}$ ) were found out in the peat of the Vidrino highmoor and which were accumulated in cell membrane of sphagnum. The mechanism of silver microparticles formation in the cell membrane of sphagnum was proposed in this work. Crystals of iron sulfide (pyrite) with size about 5-10  $\mu\text{m}$  were found out in the cysts of Chrysophyte algae (hrysophyceae). It is very interesting that only one octahedral crystal of pyrite was formed inside the cyst. It could be supposed that cyst of Chrysophyte algae is microreactor in which favourable conditions for formation of iron sulfides are created.

The obtained results show a considerable role of biogenic mineral formation in the investigated peat and sapropel that is a very important result in discussion about genesis of ore formation in which the preference is given to physical and chemical processes and often the role of living matter is not considered.

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### **References**

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