

LIVE Silicon OF LAKE BAIKAL

Silicon is one of the most abundant chemical elements in the Earth's crust; however, it is not a structure-forming element of living organisms, its high concentrations being toxic for living cells. Nonetheless, many organisms such as sponges, radiolarians, and higher plants, especially cereals, rather actively utilize silicon in their bodies' scaffolds. Note that silicon plays the most important role in the life of chrysophytes and diatoms, accounting for over 50% of their biomass.

Diatoms are known as skillful architects of manifold silica 3D structures of a nanometer scale. The new term "diatom nanotechnologies" was introduced to describe the way these organisms use to construct their silica exoskeletons. A diatom has to solve several difficult problems concurrently, namely to extract silicic acid from the sea or a freshwater lake\ river, where its concentrations are rather low; then to store the acid in the cell until it is time to deliver it to the special sites of a forming frustule where it will be polymerized. In order to get frustules with a prespecified intricate structure, the overall silica deposition within diatom cells should be strictly controlled.

Silicon technologies form the basis of microelectronics and are in great demand in many areas of modern industry, from power production to metallurgy. Since diatom nanotechnologies do not need any extremely high temperatures and "heavy chemistry", they excite strong interest of experts in different areas.

Diatoms are the most abundant group of algae in Lake Baikal, comprising both widespread and endemic species. Find below the results of molecular genetic studies carried out by young researchers of the Limnological Institute (Siberian Branch, Russian Academy of Sciences, Irkutsk) when they "reconstructed" the mechanisms of silicon "import" and production of silica frustules of Baikal diatoms

