

Chemical elements in the lithosphere and development of living organisms
ALEXEENKO V.A., ALEXEENKO L.P., SHARAFAN V. Y. Research Institute
of Geochemistry of the Biosphere, Novorossiysk, Russia.

Life and evolution of living organisms depend to a large extent on behavior of chemical elements in environment. The behavior is characterized by: 1- content of elements; 2- form of their state; 3- dispersion.

I. It is determined from the peculiarities of elements distribution that

1. There are neither harmful (toxic) nor useful elements. It would be more opportune to speak about adverse and useful concentrations.

2. Unevenness in distribution of chemical elements within the Earth' crust is less than in organisms and content of 3 elements comes to 98,5% of all living matter.

3. Oxygen content in living matter (70%) is more than in the lithosphere (47%).

4. Decreased concentrations of elements situated close to the "life-line" (which connects C, K and Fe in Mendeleev's Table) and increased concentration of ones situated farther from it exert an adverse affect on most organisms.

II. Living organisms accumulate chiefly aerial and mobile water migrants (98,5%) which content in the Earth's crust is 55%.

III. Distribution of chemical elements can be characterized by the quantity of absolute scattering. It is a maximal background (dark) content of an element in one part of the geochemical system related to a minimal one in another part of the same system. In the given case the system is the Earth' surface and its parts are different kinds of rocks.

1. The more the quantity of absolute scattering the higher the content of elements to which organisms are adapted. In conditions of extremely high content of elements some organisms died or were subjected to adverse mutations.

2. Elements with different quantities of absolute scattering considerably differ in quantities of ionization energy and electrical negativity.

3. As the earth developed the quantities of absolute scattering altered both gradually and catastrophically fast. The former phenomenon was accompanied by dying out many organisms.

4. Technogenesis results in catastrophically fast alteration of the absolute scattering of some elements.