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The features of element concentration in natural waters of the Kola North in conditions of environmental contamination

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The intensive use of fossil fuels and industrial development in last century led to the formation of acid rain and water acidification. The problem of water acidification greatly was denoted in the middle of last century in North America and in Europe as a result of air emissions of acid gases, primarily sulfur dioxide. The process of water acidification due to the interaction of two factors: 1) the high deposition of acidifying substances, taking into account the duration of exposure; 2) the sensitivity of the natural catchment area of geological, landscape, geographic and climatic characteristics (Moiseenko, 2005). The effects of acid rains on metal migration and cycling were discussed in a number of previous studies (Jeffries, 1997; Moiseenko, 1999; Manio, 2001; Moiseenko, Gashkina, 2007). The distribution of elements in water lakes has been mixed and due to the change of geochemical cycles of elements occurring in the catchment area and in water.

On the Kola Peninsula as a result of long-term operation of the copper-nickel smelter was the anthropogenic acidification and water pollution metals. Increased contents of elements due to the combined effect of three factors: 1) landscape-geochemical characteristics of watersheds; 2) dispersion with flue emissions; 3) leaching elements and bonding of metals with organic matter, especially in forested watersheds and wetlands. This region is subject to long-term effects of mining and smelting industries, and therefore difficult to find of water bodies, which can serve as a background lakes. It is proved that manmade acid rain lead to leach into the water of a large group of elements entering the water as a result of man-made streams, as well as the elements that consist of the rocks forming the watersheds.

In order to identify the relationships between the components of the elemental composition of the water in the lake was made a factor analysis using a computer program «STATISTICA 10". Factor analysis revealed the main processes that determine the conditions of residence and the behavior of elements in the water lakes. It was found that a key role in the formation of natural waters has the cumulative effect of landscape-geochemical conditions and anthropogenic impact. A great contribution, as shown by factorial analysis, make humic acid, which enhance the migratory activity elements.

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