METAL SPECIES OF IRON AND COPPER IN THE LOWER DNIESTER AND ITS BASIN

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Study of metal species in surface waters is an essential aspect during the environmental research of water bodies in the evaluation of toxicity, bioavailability of metals and their participation in the self-purification processes.

The aim of the work was to extract from the waters of the Lower Dniester Basin various metal species of iron and copper, with the assessment of their contribution to the process of self-purification of natural waters. The objects of the study were: the river Dniester (Dubasari, Criuleni, Vadul lui Voda), small rivers - the tributaries of the Dniester (Raut and Ichel) and the reservoir of the Dniester River Basin (Ghidighici and Danceni). Extraction of various metal species of iron and copper was performed by the membrane filtration followed by atomic absorption determination of metals. Thus extracted particulate (>0.45μm), colloidal (0.45 μm - 0.2 μm) and dissolved (<0.2μm) metal species. It was estimated and the total amount of each of the metals. In addition to metals in water samples is determined by many physical and chemical parameters (water temperature, Eh, inhibitory capacity of natural water, etc.).

Results of the study performed in 2015 show, that the total amount of metals in water bodies increases in the following order: Lower Dniester, the reservoir of the Lower Dniester River basin and small rivers.

Iron migrates primarily in the particulate form the amount of dissolved-form metal migration depending on time of year and the place is not more than 33.33%. The maximum amount of particulate forms of migration of iron transferred waters of Ichel and Raut, reaching values of 672 µg /l in the last tributary of the Dniester. According to our data, in the Dniester with increasing water temperature, the change in the nature of particulate species of iron, apparently, oxide and hydroxide of iron mineral forms are replaced with the high molecular weight organic metal species.

Depending on the object of the study and the time of year copper migrated differently. Sometimes prevailed dissolved form and sometimes - particulate form of metal migration. The highest concentration of dissolved copper was recorded in the reservoir Danceni and was 5.13 µg / l.

The high values Eh of aquatic objects indicate that in the surface layer water of ecosystems migration of iron and copper occurs in the trivalent states and two, respectively. The results of special experiments on the waters of the Dniester cross-sections, which included the extraction of colloidal and dissolved forms of metal migration to assess the inhibitory capacity of natural water samples show that in the process of radical self-purification it was active not only dissolved, but colloidal metal species too.