

Improvement of system of monitoring of atmospheric precipitation in the conditions of urbanized territories

Goryajeva V., Tolkacheva G., Kovalevskaya Yu.

NIGMI, Uzbekistan, Tashkent, 72, Makhsumov st../ 700052

Atmospheric precipitations are related to the most variable meteorological parameters regarding their temporal and spatial variability. Such factors as the local relief, synoptic processes and others influence the distribution of precipitation. Chemical composition of precipitation is different in regard to the correlation of the studied components depending on the degree and character of the territory urbanization.

The objects of investigation are the atmospheric precipitation sampled on the territories of the industrial towns of Tashkent province which is distinguished for the extremely continental climate, complex orography and characterized by high climatic potential of pollution and highly developed industry.

Since the beginning of the 80th of the 20th century on the territory of Republic of Uzbekistan the system of monitoring of precipitation pollution functions. In accordance with this monitoring procedure precipitations are sampled during month and further their chemical analysis is made in accordance with recommendations of the Main Geophysical Observatory of Russia [1,2]. In the process of observation of the one-time taken samples the cases of the aggressive rains (acid, alkaline) were detected in the area of Almalykl town which have negative impact on the surface vegetation, soil, buildings.

In this regard, the objective of our study was the improvement of the system of atmospheric precipitation monitoring. Alongside with the monthly precipitation sampling in the areas of high anthropogenic effect and background pollution the proposed monitoring system includes one-time taking of precipitation samples with measuring different parameters of these precipitations. Before the chemical analysis the precipitation samples are filtered and then water-soluble anions and cations and water-soluble forms of heavy metals are estimated in the filtrate. Then the active forms of heavy metals are detected on the filter.

Chemical composition of atmospheric precipitation is analyzed by the methods of ionic chromatography, atomic adsorption and photo-colormetry.

The analysis of data resulted during the investigation of chemical composition of atmospheric precipitation made it possible to reveal the influence of the local sources of atmospheric pollution on the chemical composition of precipitation. We have found out that during one month storing of the sample rather significant changes in pH and

electric conductivity and concentrations of the main water-soluble components of atmospheric precipitation are recorded. In this concern the analysis of the one-time taken samples of atmospheric precipitation is an important condition of the definition of the real state of the atmospheric air pollution.

The comparison of the results of measurements of the heavy metals concentrations has shown that their content in the solid phase is higher than in filtrate. This evidently, proves that the heavy metals in the insoluble form are adsorbed on aerosol particles which are mostly often the components of the solid emissions of the industrial enterprises.

Basing on the results of study it is proposed to make corrections to the system of the atmospheric precipitation monitoring on the urbanized territories.