



Asymmetric dimethylhydrazine as an organic pollutant of the soils of fall regions of carrier-rockets “proton” separating parts

Ch. Tassibekov, S.Batyrbekova, B.Kenessov, E. Lyu, M. Nauryzbaev

Centre of physical-chemical methods of investigation and analysis Kazakh National al-Farabi University, Republic of Kazakhstan, Almaty, (batyrbecova@nursat.kz)

The use of rocket-space equipment from cosmodrome “Baikonur” for 50 years resulted in the formation of an ecological risk in fall regions of separating parts of carrier-rockets . This activity resulted in contamination of environment with a toxic component of rocket fuel – asymmetric dimethylhydrazine (1,1-DMH) belonging to the group of first class danger substances possessing carcinogenic, mutagenic and immune-depressive properties. Besides, 1,1-DMH is very stable and can migrate and be accumulated.

To evaluate and predict the sanitary-ecological state of the soils of fall regions polluted with 1,1-DMH, it is necessary to gain information on the dynamics of its behavior. On the basis of such data it is possible to carry out works on regeneration of lands and use them again in national economy. In case of failure, it is necessary to exclude the contaminated sites from being used for a definite period of time or to use new methods and technologies of soil detoxication.

According to International Science and Technology Centre project K-451.2, Centre of physical-chemical methods of investigation and analysis is carrying out the works on a complex ecological monitoring of the environment on the territories of separating parts of carrier-rockets fall regions.

The results of the monitoring works in fall regions of carrier-rocket “Proton” first stages showed the presence of 1,1-DMH in concentrations 10-1000 times exceeding the maximum limited level and that 1,1-DMH has a high degree of stability in soils. The present day methods of soil detoxication used in practice did not give effective

results.

As a result of experimental investigations of the morphology of soil polluted with 1,1-DMH in fall regions of separating parts of carrier-rockets, we stated the character of pollution, the regularities of 1,1-DMH migration process in the soils of different types of landscapes. Investigations on the dynamics of 1,1-DMH behavior are carried out on the model soil samples as well as using the results of expedition works on the fall places.

Investigations on morphological-structural peculiarities of contamination halos allowed to work out some approaches to the methods of examination of separating parts of carrier-rockets fall places. It is possible to use these methods to further study migration of the pollutant in lateral and vertical planes.