neutron flux of the density of ~$5.10^{13}$ $cm^{-2}.s^{-1}$ (WWR-SM) nuclear reactor of Institute of Nuclear Physics, Tashkent, Uzbekistan. The concentrations of 40 elements were determined. The main interest of the present study is to assess the environmental state of the region.


# RADIOECOLOGICAL AND RADIOBIOGEOCHEMICAL SITUATION OF FLOOD-LANDS OF RIVER MAILUU-SUU (KYRGYZSTAN)

**Djenbaev B.M.[1], Egemberdieva A.D.[2], Dijkanov K.D.[1]**
[1]*Institute Biology & Pedology, Bishkek, Kyrghyz Republic*
[2]*Djalal-Abad State University, Djalal-Abad, Kyrghyz Republic*

In the end of XX c. in connection with increased texnogenium of biosphere accompanying wide application of mineral fertilizers, accumulation in environment wastes of a mining industry, household wastes and other, technogenium biogeochemical provinces and new associations of chemical elements arise. It is known, that sharp deficiency or the surplus in environment of biologically active elements results in diseases of animals, plants and a man. On the territory of Kyrgyzstan and other countries biogeochemical provinces with deficiency and surplus I, F, Cu, Cu, V, Ca, Sr, Se, U and Hg are investigated. The doctrine about biogeochemical provinces finds practical realization in medicine and agriculture (preventive maintenance of endemical diseases, synthesis of medicines, manufacture of microfertilizers etc.).

Selection of samples of soil, natural waters and plants carried out by a way of platforms on the certain routes with the account of landscape-geochemical and meteorological conditions. Processing of samples carried out in biogeochemistry laboratory of an environment GEOCHI of RAS and Biology-soil institute NAS of KR with use of soil and geological cards at an advice of the geologists and soil scientists of Kyrgyzstan. Concentration of triselementis was being by AAC, Spectrofluorimetrical and etc. methods.

During operation of a uranium deposit Mailuu-Suu (1946-1968 years) more than 10 thousand tons of uranium were extracted. According to the scientific geologists and geochemists, radioactive wastes in the given site, are quantitatively equivalent to size of the extracted uranium. In tail-deporsitory the huge weights of residual uranium and it long-lived of isotopes (Th-230, Ra-226 etc.), hence, radio-activity tail-depositories will be kept long.

Now condition of these damps and storehouses contains in a so pitiable condition, that radioactive wastes, heavy metals and the toxic substances pollute an environment. And, most dangerous sites are in landslide-dangerous zones or possible food by waters of the river Mailuusuu now. In pool of the river mudflows are often. For example, 1958 as a result of failure on tail-depository №7 on the river has passed radioactive mud torrent with the charge more than 200 $m^3/s$.

In the whole water p. Mailuusuu on our received data is unsuitable for drinking and cultural - household usage. The highest concentration after the attitude LPC (limit-permissible-concentration) is characteristic for Se (up to 20 times), and the level does not change in all extent of the river. Further is accumulated Fe up to 8 times more, is especial 2 and 5 points, and Hg, Cd and Al up to 2 times. It is necessary especially to note, that in r.Kulmen-Sai (inflow r.Mailuusuu are marked the increased contents of uranium up to 5 times, where the inhabitants use water for watering and economic needs. The concentration of other investigated microelements in the river at a level ore is lower LPC. Till current of the river the level of concentration Hg, Cd and Se does not vary almost, it is constant, on other elements of the certain laws is not revealed.


# INVESTIGATION OF DISTRIBUTION AND MIGRATION OF HEAVY METALS IN RIVER WATERS BY RADIOACTIVATION ANALYSIS

**Kulmatov R.A., Kulmatova D.R., Umarov M., Kenzhaev D., Alikulov R.V., Tillaev H.**
*Termez State University, Termez, Uzbekistan*

Successfully solving problems of monitoring, protection and rational use of river water demands complex systematic study of laws of space-time distribution and migration of heavy metals (HM). For this purpose there was developed and used high-sensitive radioactivation method. For determination the migration form of HM in river water was developed a method of fractionating by using of ultrafiltration and electrodialisis.

By using of radionuclides $^{60}Co$, $^{51}Cr$ and $^{124}Sb$ in cationic and anionic forms were established optimal conditions of division form of HM.

Then each fraction was analyzed using radioactivation analysis. We were the first to study distribution and migration of HM in the main rivers using developed methods.

During 1990-2002 we have studied space-time variations of content and phase distribution and migration forms of Hg, Zn, Cd, Sb, Co, Br, Cr, Th, Au, La, and Eu in water of the rivers of Amu Darya, Syr Darya. Average concentration of HM fluctuates from 2.1 mg/l for Fe to 4 ng/l for Au.

Relative error of determination of 20 HMs including Hg, Cd, Zn, Sb, Co, U, Br, Cr and rare earth elements in water made 10-25%. Limits of determination of HM are $10^{-6} - 10^{-10}$ g/l.