

POLLUTION IN HUMID AND ARID ZONE OF RUSSIA

Lomonosov Moscow State University, Russia

In the paper the pollution factors in different zones of Russia are studied. The difference between further fate of technogenic associations in humid and arid regions is analyzed.

Key words: pollution, technogenic associations, humid zone, arid zone.

T. O. Зубкова

Московський державний університет ім. М. В. Ломоносова

ЗАБРУДНЕННЯ ВОЛОГИХ ТА ПОСУШЛИВИХ ОБЛАСТЕЙ РОСІЇ

У роботі досліджуються фактори забруднення різних областей Росії. Аналізується різниця між подальшим розвитком техногенних сполук у вологих та посушливих регіонах.

Ключові слова: забруднення, техногенні сполуки, волога зона, посушлива зона.

T. A. Zubkova

Московский государственный университет им. М. В. Ломоносова

ЗАГРЯЗНЕНИЕ ВЛАЖНЫХ И СУХИХ ОБЛАСТЕЙ РОССИИ

В работе исследуются факторы загрязнения различных областей России. Анализируется разница между дальнейшим развитием техногенных соединений во влажных и засушливых регионах.

Ключевые слова: загрязнение, техногенные соединения, влажная зона, засушливая зона.

There are three associations of elements in soils: geochemical, inherited from the rock, biochemical - inherited from the plants and biogeochemical or soil.

In rocks a correlation of chemical elements is more stably. The biochemical association depends on selectivity of plants in relation to elements. For enough mature soils this correlation is stable for the concrete territory, but differs from biochemical and geological. The technogenic association sharply changes a correlation of elements in soils. And this can serve as the passport for revealing of pollution source. For example, in east area of Moscow, where there are 3 factories, pollution of soils by metals (Cu, Pb, Hg, Zn and others) is established. It is possible to define, from what factory there is a pollution on a correlation of technogenic elements.

Natural associations of elements are selected on structure of rock, plants and on soil structure. These three associations can connect with technogenic association, which it is easy to define on a ratio of elements, even at an initial stage. It is possible to reveal a direction of technogenic associations development at continuation of technogenic influence.

The composition of technogenic association is defined by intensity of pollutant, technogenic object, distant from object and an area wind rose. These parameters or pollution factors are studied. "However it is not enough attention to influence of soils on the further pollution fate. The part of technogenic association can change up to a total disappearance depending on character of a soil matrix, type of a water regime, a hydrological soil profile. .

Theoretically it is necessary to expect that in humid and arid regions the further fate of technogenic associations will be different. In humid regions the part of elements will leave with a water drain in ground waters, the rivers and the seas. Other part will be preserved in humus and illuvial horizons. In arid soils all elements will be fixed in the top horizons of soils and not to move almost on a profile. Pollution in arid conditions remains

as a constant factor of these soils. The essential changes of a composition of technogenic association are possible in humid soils.

In arid and humid soils, one of the factors determining the fate of pollution (anthropogenic associations) is geochemical barriers. They accumulate number of elements, changing their ratio compared to the original technogenic association, and create a new soil association.

The microrelief participates in redistribution of polluting substances also. However if in an arid zone pollutants are more on macroelevation, in humid zone is on the contrary.

The accumulation of metals is a new stage in the soil life. Heavy metals interact with organic matter and form organometallic complexes that are catalysts for chemical reactions in the soil. Oxides of manganese and iron accelerate the redox reactions, for example - decomposition of hydrogen peroxide and organic hydroperoxides. There are Fe-Mn formations and mangaia (manganese Kutans), which many in the lower soil horizons (horizons B). We should expect new catalytic reactions (even unpredictable) as a result of pollutants accumulation in the soil.

Надійшла до редколегії 25.11.10