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**THE IMPACT OF PETROL AND DIESEL ON FUEL SOIL CONTAMINATION**

Pollutionoftheenvironmentwithpetroleumsubstancescontainingmanyhighlytoxiccompoundsisextremelydangeroustoliveorganisms.

Modern tempoes of industry development and growth of mankind energetic demands lead to every year petroleum extraction throughout the world, that’s why in last decades questions connected with influence petroleum and oil-refining enterprises on ecological situation in different regions especially in Ukraine became more actual.

That’s why the goal of article is to give total assessment of soils destruction under influence of petrol pollution. The objects of research are soils in the area of influence of main Ukrainians pipe lines.

That’s why a large number of high-fertility chornozems of agricultural use are taken away from use like soils on the territories of oil-refining enterprises and oil pipe-lines. Surface and underground waters are polluted by oil-products and accompanying toxic substances. They transform fertility chernozems into ecologically critical ecosystems. One of recipients of petroleum pollution is soil. Soil pollution is closely connected with negative influence of harmful substances on flora and fauna. Self-purification abilities of soil are also broken as the consequence of petroleum pollution.

No organization has any reliable information about soils conditions and pollution. Still more differences about enterprises and regions doing treatment of foil and petrol and diesel oil bring significant harm to the environment. It’s well-known fact, that 2 g of petrol make soil unsuitable for plants and microflora life, 1 liter of petrol deprives oxygen for 40 thousands liters of water, 1 ton of petrol pollutes 12 km2 of water surface.

They bring considerable changes to soil physical-chemical characteristics. Especially is the aftereffect of soil structure destruction and dispersion of soil parts permeability to water is reduced and also filtration regime is disturbed. In polluted soils there is high correlation between carbon and nitrogene high growth (because of content of carbon in petroleum). It makes worse nitrogene regime and worsens plants roots nutrition.

Soil cover – is a comparatively stable component of geosystem which has practically unlimited property to accumulate, hold and process pollutants. The condition of its component is determined by following basic indicators:

• level of pollution by chemical elements ;

• level of activity of self-purification processes, destructuration of mineral substances;

• ability of natural fertility upkeep and fertility recovery;

• fertility as the basis of recovery of flora and consequently of fauna.

That’s why the reclamation of damaged and polluted lands in oil deposits and reached balance in the damaged agrolandscapes is one of the most important tasks. Lands need reclamation and return into agricultural production. With the help of modern agrotechnicalphytomeliorative and microbiological technologies there exists real opportunity to return damaged and polluted lands to usual natural conditions in the shortest possible term.

The total area of damaged lands in Ukraine is 144,5 thousands of hectares. During 2010 year 477,9 ha of such lands had been reclamated, in 2011– 571,1 ha, in 2012 – 683,5 ha (86% of this lands – 589,6 ha are agricultural lands. Financing and organizations of works for lands protection lead from state and regional budjets but is very slow. In 2012 and 2013 years there were no costs provided by state budjet of Ukraine.

 The total area of polluted lands were 119 thousands ha during 2012, 2,5 thousands of hectares were conserved; 1,3 thousands of hectares from it - with the help of forestation, 1,2 thousands of hectares – with the help of meadow creation.

In spite of this fact that percentage of petroleum deposits in Ukraine is 40 – 50 during its working out and exploitation it’s necessary to avoid soil pollution and to preserve flora. It can be done with the help of such measures: working out and implementation of efficiency methods of clinker separation from auger sewage waters and its removal to special places; decrease of volumes of use of flushing solutions with the help of second use of auger sewage waters, enhancement of techniques and technologies of its purification; implementation of new ways of removing auger towers (using phneumatic tools etc. Working out and implementation microbiological of soils purification from petroleum and petroleum products’; speeding up the building of system of gathering and working over of oil gas and gas condensate. The most informative data about ecological safety of oil-products for soil ecosystem are results of determination of soil toxic influence on organisms especially phytotoxic - ability of soil to make depression influence on plants which lead to infringement of physiological processes, worsening quality of plants production.

Petrol pollution creates mew ecological situation and leads the deep change of all links of natural biocenosis and its full transformation. General peculiarity of all kinds of soils polluted by oil – is change of the species variety and limitation of pedobionts (soil mezzo- , microfloura and microfauna).

The reason of frequent emergencies on pipe-lines is unauthorized interpol of outlier persons in consequence of pipe-line depressurized on the hundreds of kilometers of track with the flowout of oil-products and it put on the soil’s surface. As a result – spots with tens of square kilometers size are created.

It was established that the main influence into kinetics of absorption of diesel fuel by soils makes by content of small sand and physical clay. Researched soils can be ranged in following way: “turf clay sandy > brown forest > turf deep clay >usual black soil > grey forest.

Exist the opinion that weak pollution can be removed in the process of self-purification during first 2 – 3 years, middle pollution during 4 – 5 years. Beginning of serious ecological losses is soil’s pollution in concentration which are higher then 13 g/kg, because begin migration of petrol products to subterranean waters,

ecological balance significantly disturbed in soil biocenosis.

In accordance with specialists’ data absolutely majority (89-96%) of emergency oil spill call strong and irrevocable damage of natural biocenosis. On the tracks of pipe-lines width of zone of damage varies from 40 m to 400 m for one magistral line.

In the process of studying the species variety of plants which are in the direct neighbourhood to these lands it was determined that under present conditions there is no technogenic impact upon the vegetation cover because the turf stratum of the territory is compact, without gaps, in the collected natural material there are plants specific for this locality, there was observed no violation in their growth. That is, the state of the ecological safety of soil cover corresponds to the normative one in these conditions.

In view of the fact that a part of the territory of agro-industrial complex of Ukraine is in oil extraction district today it is perspective to produce the agro-ecological evaluation of soils.

To evaluate the ecological danger of polluting natural environment by petroleum products it is necessary to characterise such indices: 1) the content of petroleum products in several components (such data are obtained in standard regime after carrying out monitoring observations); 2) the rate of their chemical and biological destruction (on the basis of carrying out the complex of long-term and labour consuming experiments by volume under field and laboratory conditions); 3) the level of petroleum products toxicity concerning live organisms.

As a result of non-mono-factorial character of petroleum and petroleum products action the toxic activity of soil is difficult to forecast because several components interacting between themselves and soil environment are able to be activated or inactivated by various exterior factors. Norms of ecological regulation are comprehensive and take into consideration the petroleum action upon soil biota and physical chemical soil properties. Bio-testing, bio-indication and eco-toxicology, along with methods of analytical chemistry, give the possibility to get as a whole the complete picture of the degradation of soils polluted by petroleum products. The principle of bio-indication is built on the fact that that each organism concerning the acting factor possesses unique physiological reaction scope.

At the same time each particular group of organisms is influenced by other numerous factors which are not always possible to consider. Therefore, the comprehensive evaluation of the eco-toxicity of soils polluted by petroleum is advisable to carry out on the basis of bio-tests of various trophic levels, in particular: of soil exo-ferments, of soil micro-flora and fauna, of plant indicators, of plants-remediants, etc.

In selecting test-organisms it is essential to use bio-tests most sensitive to the action of pollutants. The second important requirement concerning test-organism lies in the fact that the action of toxicant upon it must obligatorily cause the reverse reaction of the organism.

Vegetative test-systems are rather reliable and convenient in determining the degree of the toxicity of certain pollutants, besides they give the possibility to assess the summary effect of the action of different types of pollutants, including the evaluation of the degree of the degradation of soil eco-systems which undergo the anthropogenic influence of various plans. The most informative data concerning ecological danger of petroleum products for soil eco-system is the establishment of the phyto-toxicity - the ability of soil to exert oppressive influence on plants which leads to the violation of physiological processes, to the worsening of the quality of vegetative produce.

The impact of petroleum pollution upon plant organisms occurs in two ways: directly (as a result of the penetration of oil components via root system or leaves breathing and their inclusion into metabolism) and indirectly (via the change of physical-chemical soil composition and the violation of its biotic properties).

The direct impact of petroleum on vegetation cover is in the fact that the plant growth is slowing, functions of photosynthesis and breathing are violated, various morphological violations are discovered, rot system, leaves, stems and reproductive organs suffer greatly.

To diagnose and assess the toxicity of petroleum pollutes soils are usually taken into consideration such indices as plant height, number, length and width of leaves, the length of petioles, quantity and length of shoots, quantity of flowers, sizes of blossoming parts, the quantity of fruits and seeds in a fruit, the total mass of a plant and the mass of its parts, etc. Physiological biological and cytogenetic parameters of vegetation test-systems are suitable for the quantitative evaluation of the action of factors under conditions of technogenic pollution. Bio-indication of petroleum polluted soils in agro-ecosystems is done on the basis of reactions of agricultural crops with different sensitivity to a given factor.

Thus the pollution by petrol and diesel oil on Ukraine –is an ecological disaster. Petrol and diesel oil when it appeared in soil violates process of life activity. It deprives microbe self purification, changes trend of metabolism. Petrol products in natural conditions decompose during many years and bring big harm to nature. Processes of natural regeneration of the agrocenosis on polluted territories take place very slowly.To provide safe operation of pipe-lines it’s necessary to work out system of isolation measures.