

Міністерство
освіти і науки
України



Міністерство освіти і науки України
Національний університет біоресурсів і
природокористування України
Механіко-технологічний факультет
НДІ техніки та технологій
Кафедра транспортних технологій та засобів у АПК



Представництво Польської академії наук в Києві
Польська академія наук відділення в Любліні
Академія інженерних наук України
Українська асоціація аграрних інженерів



90 річниця механіко-технологічного факультету
НУБіП України присвячується

**ЗБІРНИК ТЕЗ
доповідей
II Міжнародної
науково-практичної конференції
«Автомобільний транспорт та інфраструктура»**



AutoTransport and Infrastructure

11-13 квітня 2019 року
м. Київ

CLEANING SOILS FROM PETROLEUM PRODUCTS PHYSICO-CHEMICAL METHOD

Mykola Kalivoshko, Ph.D., Associate Professor,
National University of Life and Environmental sciences of Ukraine

Actuality of theme. The work of the machine-tractor park is based on the use of petroleum products, which, when transported and used, often reach the environment. Large losses of bulk cargoes only when transported by rail arise as a result of: intensive evaporation during pouring, filling and drainage of tanks; discharging into the environment unused cargo balances at uncleaned cisterns. The average loss of petroleum products during transportation is more than 0.6 tons per tank. Environmental protection of petroleum products has not lost its relevance.

The purpose of our research is to substantiate the feasibility of using physicochemical methods for purifying soils from petroleum products.

Physico-chemical methods make up the most significant group of methods of purification and neutralization of soils contaminated with petroleum products and heavy metals. When creating physical fields in porous environments, simultaneously a large number of physico-chemical processes begin to flow.

When the field of mechanical stress is applied, the dirty soil is stirred vigorously and the soil particles are removed from the surface contaminants. Hydrodynamic action on a soil solution or soil is accompanied by sulphosis, leaching, adsorption, diffusion and removal of soil contamination from the air. Close to the hydrodynamic method is the extraction and purging of carbon dioxide in an extremely critical state.

A constant electric field created in saturated soil water causes the passage of electrochemical and electrokinetic processes. Electrochemical processes include electrolysis, electroflotation, electrocoagulation, electrodestruction, electrochemical neutralization, ion exchange, electrochemical oxidation and leaching, electrodialysis, and electrokinetics - electroosmosis, electrophoresis and electromigration. In electroflotation, the removal of petroleum products occurs in bubbles of gas formed by electrolysis and uplift to the surface. Electrocoagulation:

- is the process of aggregation of microparticles of a mineral nature and organic molecules, where iron and aluminum electrodes are used, at dissolution of which hydroxides are formed, adsorbing contaminants and those which fall out then into a

precipitate. Electrochemical oxidation is used to clean soils from chlorinated carbohydrates and phenol. Efficiency of oxidation of phenol 70-92%. Electrodegradation occurs at the electrochemical decay of toxic organic compounds on electrodes with the appearance of non-toxic substances. Advantage of the method in low cost and high efficiency.

In the electro dialysis of the steam soil solution, there is a clearing of pollutants in the colloid form, as well as desalting in the middle part of the interface between the electrode space.

Conclusions The reagents of purification of soils from petroleum by the physico-chemical method, in comparison with other methods, in its low costs and high efficiency.