

**M. I. MEDVID, L. I. CHELYADYN (UKRAINE, IVANO-FRANKIVSK)
ECOLOGICAL AND TECHNOLOGICAL ASPECTS OF ENVIRONMENTAL
PROTECTION TECHNIQUES OF DOMESTIC WASTE LANDFILLS
ENVIRONMENT PROTECTION**

*Ivano-Frankivsk National Technical University of Oil
and Gas, 76019, 15 Karpatska street, Ivano-Frankivsk, Ukraine*

Environmental protection of landfill territories from pollution of filtrates is an extremely important problem as far as it influences the flora, fauna and people. Especially dangerous are filtrates, which occur in the body of a landfill, have many different harmful components and can pollute water resources. Study of filtrates purification on the basis of electrical, chemical and sorption technique has been conducted and diminution on the average by such indices: DCO to 211,5 mgO²/dm³; ammonium nitrogen – 3,24 mg/dm³, nitrites – 0,97 mg/dm³ has been got.

Modern condition of technological and ecological safety in Ukraine, especially in places of domestic waste storage is extremely dangerous as far as such territories contain main causes of ecological danger, that is pollute the atmosphere, water resources by sewage, filtrates and soil. Foreign publications contain different techniques and basically these techniques include oxidation treatment (OT) of sewage, which is long-continued, takes place under certain process-dependent parameters and occupies great territories. Considerably more efficient method of sewage treatment in comparison with DCO is physical and chemical purification of contaminations in accordance with the technology that include physical, electrical and chemical processes, which take place in local decontamination units.

The aim of the research is the development of a new complex electrical, chemical and sorption technique of filtrates purification, which pollute natural water resources.

Suggested physical, electrical and chemical techniques give possibility to treat effectively sewage, because electrotreatment before settler cause destruction of soluble contaminations and their further flotation to the upper part of a thin-layer settler and zeolite sorbs residual soluble and insoluble contaminations that were not separated in a settler. Physical and chemical indices of a real filtrate are given in the table below. For filtered feed of a filter were used different samples of zeolite clinoptiolite from Sokyrnytske field with the help of a laboratory unit, which consists of containers for sewage, a pump, electric devices, a thin-layer settler and filtration columns. Results of the study in dependence on different parameters of electrotreatment, angle of gradient of inclined planes in a settler and the size of grains in zeolite fractions (mm.), which are placed in different filtrating columns, are shown in the table.

Indices of filtrates purification with the help of electrical, chemical and sorption technique

№ of a sample/ filter column	Before purification			After purification			Degree of purification α, %		
	Ammonium nitrogen mg/dm ³	Nitrites mg/dm ³	HCK mgO ² /dm ³	Ammonium nitrogen mg/dm ³	Nitrites mg/dm ³	HCK mgO ² /dm ³	Ammonium nitrogen	Nitrites	HCK
1/I	33,2	4,01	905,0	3,5	1,0	218,4	89,5	75,0	75,8
2/I	39,8	4,2	938,0	3,8	1,05	224,5	90,4	75,0	76,0
1/II	33,2	4,01	905,0	3,1	0,95	204,8	90,6	76,3	77,4
2/II	39,8	4,2	938,0	3,0	0,93	205,3	92,5	77,9	78,1
3/II	35,0	4,2	960,0	2,8	0,91	204,6	92,0	78,3	78,7

Note: I – filter with a fraction 1-3 mm of zeolite, II – filter with a fraction 0,5-1 mm.

Conclusion: Study of a filtrate purification show that conducting the purification of a filtrate in accordance with electrical, chemical and sorption technique increases the degree of its purification from ammonium nitrogen up to 89,9 – 97,8%, nitrites 89,9 – 97,8%, and filtration with the help of zeolite increases it still more for 2-4%, that is proved by DCO index, which is equal to 91,9 – 95,1%, as far as the content of organic and inorganic contaminations is decreased.