The characteristic of theflotation concentrate: humidity – 0,7%; on a dry concentrate,%: ashes – 47,3; volatile matters– 45,3; general sulphur– 1,0; carbon – 42,8; hydrogen – 6,5.

The oxidation was spent in the three-necked round-bottomed flask with the1 litercapacity supplied with the reverse refrigerator, thermometer and a mixer on interchangeable ground glass joints. In the beginning 60% nitric acid wasinfused (on the basis of kerogenoxidation to amber acid), and then a concentrate entered by portions at continuous interfusion of suspension by a mixer then electroheatinghas on and temperature of a reactionary mix was lead up to 90°C. Duration of experience was from 6 till 8 hour. Experiences were spent as with preliminary extraction of high-molecular matters of acidic character from organic mass of slate by boiling with 10% solution of alkali during 3–4 hours, and without it. At small time of oxidation insoluble acids were formedwhich were situated on the surface of theacidic solution in the form of the resinysubstance which were exposed to the further oxidation.

96,3% ofSOM are oxidizedat processing of the enriched slate by nitric acid during 8 hour. 85,7% of high-molecular acids (soluble in water alkali), about 1,9% of a benzene extract, 12,4% of a etheric extract and 24,1% of an n-butyl alcoholextract are formedat that. The exit of volatile acids in all experiences makes less than 1% that point at soft conditions of process, i. e. on deep destruction of organic matter of slates.

The oxidation of Kendyrlyk slate by air oxygen was spent in a column of bubbling type. In the end of experience unoxidizedslate and a mineral part has separated from soluble products of oxidation by the filtration, washed out by water, dried up and their exithas defined. Soluble products of oxidation (salt of organic acids and surplus of alkali) were neutralized by hydrochloric acid to pH = 2.

Filtered, lade-down in a bottom «high-molecular acids» has dried and their exit hasdefined. Volatileacids with water steam hasdistilledfrom a filtrate, and the remainder has extracted byethylacetate. An exit of oxidation products (on oxidizedSOM) is following (%): High-molecular acids – 48,2; Volatileacids – 7,8; Nonvolatile acids (an ethylacetateextract) – 34,5.

The volatileacids from a water solution wasextracted by the sulfuric ether. The extract was dried, and the ether was distilled. The driven out acids were dispersed on rectifying column under atmospheric pressure. Almost80% of acetic acid has been received as a result of rectification. The others 20% fall on propionic, isobutyric, isovalerianicand enanthicacids.

Insuch a manner it is shown that at SOM of Kendyrlyksky slate oxidation by nitric acid and air oxygen high-molecular, middle-molecularand low-molecular acidsare formed. Volatileacids basically consists of acetic acid. The exit of oxidation products depends on reaction conditions.

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THE ASSIGNMENT TO HAZARD CLASS (TOXICITY) OF INDUSTRIAL WASTE CHEMICAL ORIGIN DESIGN BY THE ESTIMATED METHODS

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The collection, accumulation, storage, waste transportation safe conditions in the buildings, on the objects' territory, in the surrounding environment are defined by the hazardous waste class, by the packing method, with due regard for the aggregation state, and the cargo safety. The hazardous waste class (e.g. the grade) for the surrounding environment, the human surrounding environment, and the human health are also taken into account at the challenges dealing with the opportunities and the technologies (e.g. the methods) of their handling, processing, use, disposal, neutralization, and location. In addition, the set for further withdrawal of the hazard class has become the basis for the fee standard establishing for the waste units disposal.

The hazardous waste class (e.g. grade) establishing procedure for the surrounding environment (e.g. hereinafter – SE) is practically such the complex and the controversial solvable challenge, which inevitable has been become the intractable disputes cause between the economic entities and the corresponding economic players, having defined the hazardous waste class, and also by the state bodies of the enforcement authorities, having coordinated the already obtained results and their findings.

Thus, the whole complexity and the ambiguity of this procedure is associated with the «Hazardous Waste Assignment Criteria, Classified as the Dangerous Classes for the Surrounding Natural Environment», methodological apparat, having approved by the MNR Order of Russia, dated from 15.06.2001, №511 (hereinafter – the Criteria), and «The Sanitary Rules for the Hazardous Class Determination of the Production and Consumption Toxic Wastes» SR 2.1.7.1386-03, having approved by Resolution of the RF Chief State Sanitary Doctor, dated from 16.06.2003, №144 (hereinafter – SR 2.1.7.1386-03). So, according to the first normative and the regulatory document (e.g. the Criteria), the wastes, depending on the negative impact extent on the SE, have already been divided into the five classes of the risk: from the extremely dangerous ones (e.g. the I-st class) up to practically almost non – hazardous ones (the V-th class). Then, according to the second normative and the regulatory

document (e.g. SR 2.1.7.1386-03), the wastes, according to their toxicity degree on the surrounding environment and the human health, have already been divided into the four classes: from the extremely dangerous ones (e.g. the I-st class) up to the low – hazard ones (e.g. the IV-th class).

According to all these documents, it has been provided, that the hazardous wastes class definition is carried out by the estimated and (or) by the experimental method, having accredited for these purposes by the organizations. So, the division into the classes of the hazard is carried out by the quite different and the various criteria – by the ecological ones in the Order №511 and by the toxicological ones in the SR 2.1.7.1386-03 (e.g. for the surrounding environment and the human health).

Moreover, it has not been determined the correlation between the ecological and the toxicological standards in none of the normative and the regulatory document for the calculation method, which is manifested in the *Wi* setting: the ecological risk extent factor of the *i*-th wastes component for the first document, and the component hazard extent coefficient for the second document. So, the primary indicators system, in the first case, is provided for the 19 positions, having reflected the risk value (e.g. the wastes hazard extent ratio for the SE). There are – up to the 23 ones in the second document, which the most complete and true and fair is reflected the risk value (e.g. the cumulative hazard index).

The Federal Classification Wastes Catalogue (e.g. having approved by the RF MNR Order, dated from 02.12.2002, №786) together with the amendments thereto, dated from 30.07.2003, №663 is marked, among the most significant existing documents, within the framework of the current legal – normatively and handling treatment with the production and the consumption wastes. So, this document has been generated, as at the Federal level document, where the existing differences among the RF subjects are not considered in the technological processes and the nature conservation, and the environmental issues regulations.

A number of the industrial wastes the hazard class is required the regional substantiation, because of the extreme climatic – naturally peculiarities and the characteristics features of the region. As it is well known, the Tyumen region – is the only region of Russia, having extended (e.g. together with its autonomous districts) from the Arctic Ocean in the North up to the Southern state border, that having caused to the quite various and the different climatic – naturally peculiarities and the characteristics features: the Arctic and the sub – Arctic climate in the North, and the moderate one – just in the Center and the South of the region. From this point of view, the hazard class study a number of the industrial wastes heat power engineering and its industry is of the interest, with due regard for the technological processes in adherence to the Federal requirements established, and, if necessary, its adjustment to the region's conditions.

Within the framework of the existing work, the material has been chosen for the hazard class to be assessed and to be analyzed, which is the organic nature representative – the HEPS (e.g. the heat electric power station) industrial waste, having generated in the production, as the cooling systems refrigerant – the ethylene glycol remnants, which has been lost all the consumer properties. In accordance with the GOST (e.g. the State Standard Specification) 28084-89, «The Fluids, Having Cooled the Low – Freezing» cooling fluids (e.g. hereinafter – CF), by its main parameter – the necessary resistance to the extreme low temperatures, having characterized be the crystallization commence temperature, are made of the several types of the industry: the CF-K, the CF-65, and the CF-40. In addition the ethylene glycol coolant, the anticorrosive, the antifoaming, the stabilizing additions and the dyes stuff are added into the CF.

The ethylene glycol optimum concentration in the cooling fluid is made 50–60 % (e.g. the recommended ones for the ethylene glycol working ratios applications – from 35 up to 70 %). The other components concentrations – are the water (e.g. ≈ 40–50 %), the modifying additives (e.g. 2–5 %), and the dye stuff (e.g. the low dose). So, the ethylene glycol and the water mixture is quite different by the fact, that its crystallization temperature is quite depended upon these both components ratio. Then, it is significantly lower at the mixture, than, separately, at the water and the ethylene glycol. The lowest value, that is the freezing temperature, is corresponded to the composition, in which by the mass of the ethyl glycol is 65 %, and the water is 35 %. So, the ethyl glycol and the water mixture in the 52:47 proportions has already been adopted for the wastes assignment to the hazard class (e.g. the toxicity) in the South of the Tyumen region.

So, this type of the wastes choice has been based on the fact, that the Federal Law implementation №89 «On the Production and Consumption Wastes» by the Head Office of the GN and OOC MNR of Russia for the Khanty – Mansiysk Autonomous District the Order, dated from 16.06.2004., №75–7 «On the Approval of the Approximate Component of the Hazardous Wastes Composition, Having Presented in the FWCC, which Are Not Subjected to the Class Risk Confirmation for the Surrounding Environment», which this type of wastes is not included in, has been published, and it is operated today. In addition, the waste is the specific one, and it, moreover, is presented the very serious and the severe toxicological and the environmental hazard, and as for the surrounding environment, well as for the human health, and it also is created the challenges in the matters of the economic – technically regulation: the utilization (e.g. method) technology choice, and the payments calculation for the hazardous wastes disposal.

Thus, the ethylene glycol is presented itself the viscous, which is quite similar with the glycerine, the colorless liquid, which, in addition to the freez-

ing temperature point depression, it is resulted in to be increased the CF boiling temperature, that it is the additional benefit in the cars use in the warmer seasonal months. So, the concentrated ethylene glycol is the toxic, the $MPC_{s.f} = 5,0$ mg/m^3, $MPC_w = 1,0$ mg/l (e.g. c.-т.). It has the narcotic effect. If ingested inside, it can cause the chronic poisoning with the subsequent injure to the vital – important human organs (e.g. it is in effect on the blood vessels, the kidneys, and the whole nervous system). So, the lethal dose at the single oral administration is made up 100–300 ml ethylene glycol. (e.g. 1,5–5 ml per 1 kg of the human body weight). There are, moreover, the suspicions on the carcinogenic effect possibility of the ethylene glycol, that is why, the works on its filling just into the circuit cooling system and its further utilization, and the necessary disposal are efficiently conducted by the experts, the specialists, and the professionals.

So, it was found, according to the presented data by FWCC, that the ethylene glycol remnants and residues, which had been lost all the consumer properties, are described and characterized by the estimated method, as the third class of danger wastes. Moreover, it will also be required the necessary calculation carrying out for the hazard class determination of the production and the consumption toxic wastes. Thus, the results of the estimated determination of the hazard class (e.g. toxicity) of the wastes from the thermal power plant (TPP) technological process, having situated in the South of the Tyumen region, will be allowed to be drawn the conclusion on the regional technological processes and the nature conservation, the nature protection, and the environmental issues assignment by the Federal requirements, in terms of these types of the wastes treatment.

All the necessary calculations have already been conducted for this purpose, according to the estimated methods of the Order №511 and the SR 2.1.7.1386-03 on the specific class of the hazard (e.g. toxic) wastes determination of the already selected industrial wastes of the Tyumen HEPS-1.

The wastes assignment to the class for the surrounding environment by the estimated method is carried out on the basis of the K indicator, having characterized the hazardous wastes degree during the surrounding environment impact, having calculated by the substances indicators sum, having made up the (K_i) wastes, where K – the hazardous wastes degree index for the SE. So, the wastes components list and their quantitative content are installed by the composition of the raw materials and its processing technological processes, or by the quantitative chemical analysis results. Then, the *Ki* index of the waste component hazardous degree for the SE is calculated by the following formula 1:

$$K_i = C_i / W_i, \quad (1)$$

where C_i – the *i*-th component concentration in the hazardous wastes (e.g. kg/kg of the wastes); W_i – the environmental risk degree factor of the *i*-th wastes component – the conditional indicator, which is numerically equal to the wastes components amount, below the value, which it does not have the negative impacts upon the SE.

Their environmental risk degrees for the various and the different natural surrounding environments are established for the W_i factor determination for each component of the wastes. According to the established degrees of the wastes components environmental risk in the different and the various natural surrounding environments range, the relative parameter of the wastes component risk is calculated for the SE (X_i), where X_i – is the relative parameter of the wastes component risk. The W_i factor value is quite depended upon the X_i and the Z_i ones, where Z_i – is the unified relative parameter of the environmental hazard.

Thus, *the assignment to the hazard class of the production and the consumption toxic wastes* by the estimated method is carried out on the basis of the *K* index, having reflected the hazardous wastes total index at the impact upon surrounding environment and the human health, also, having calculated by the substances indices sum, that are made up the wastes (K_i), i.e. analogously to the expression by the formula (1). So, for the whole list of the components wastes constituents the coefficient calculation of the *Wi* wastes component risk degree is already carried out quite without the Z_i intermediate parameter, and directly through the X_i, where X_i – is the average parameter of the wastes component hazard.

The recommended ranges comparison, in terms of the *K* index, in assignment to the hazard class, according to the Criteria and the SR 2.1.7.1386-03 has been shown in the Table 1.

Table 1

The Compliance with the Key Acting Estimated Methods for the Specific Hazard Class

The Order № 511, dated from 15.06.2001		The SR 2.1.7.1386-03	
The wastes hazard class	The degree index of hazardous wastes for SE	The waste hazard class	The wastes hazard total index
I	$10^6 \geq K \geq 10^4$	1	K > 50 000
II	$10^4 \geq K \geq 10^3$	2	50 000 > K > 1 000
III	$10^3 \geq K \geq 10^2$	3	999 > K > 100
IV	$10^2 \geq K \geq 10$	4	K < 100
V	K < 10		

Within the framework of the carried out hazard class determination (e.g. toxicity) of the ethylene glycol residues and the remnants by the estimated method, having lost the consumer properties, the following values have already been established, having given in the Table 2.

Table 2

The Ethylene Glycol Residues and Remnants Hazardous Class Comparison, Which Has Been Lost the Consumer Properties, Having Obtained by the Estimated Methods, and Having Been Established by the FWCC

	The Document, confirming the wastes assignment to the hazard class		
	The Order № 511	The SR 2.1.7.1386-03	FWCC
The wastes hazard class	IV	2	3

So, it has been found, in accordance with the established estimated methods of the departmental documents, according to the hazard class and the wastes toxicity definition, that the K index resulting value is not confirmed the assignment of the K studied wastes to the third class of the risk for the surrounding environment, and, at the same time, it is referred the wastes to the second class of the toxicity for the surrounding environment and for the human health.

In order to be confirmed the hazard class, having obtained by the estimated method, it is recommended the obligatory procedure of the experimental method, which is consisted in the environmental toxicity laboratory study of the analyzed samples with the biological objects application, that are made it quite possible to be determined the environmental wastes toxicity under the controlled reproducible conditions. So, the estimated valuation results of the hazard class (e.g. toxicity) ethylene glycol residues and remnants, having lost the consumer properties and its characteristics just from the technological process of the Tyumen HEPS-1, are shown the discrepancy for the regional technological processes, the nature conservation, and the environmental issues in the aspect of the Federal requirements, in accord of the reliable assignment to the risk class of the wastes indicated type on the given territory.

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