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INFLUENCE OF PHYSICAL TRAINING ON MORBIDITY RATE OF STUDENTS OF TASHKENT CITY

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There were evaluated the significance of physical training and the quality of nutrition for the morbidity of children and adolescents studied in public educational schools. The traditional system of physical training used in schools (control) is revealed to not capable to proper reduction of morbidity in children and adolescents by the end of the educational year. Reorganization of physical training and rationalization of nutrition of schoolchildren (basic school) have allowed reduce the morbidity level in the year to 34,2% mainly due to reduction in the incidence of diseases associated with the overall resistance of organism. Another problem is the question to reduce the frequency of diseases of bones and joints, for which found rising levels of morbidity, both in basic and control schools.

Keywords: morbidity, hygiene of children and adolescents

As Oreshkin (1990), Milner (1991), and Lubysheva (1992) noted, the value of physical training and sports for the full development of personality, health promotion and prevention of harmful habits (smoking, alcoholism, drug addiction) is not in doubt [4, 6, 8].

In the literature, there is evidence of the presence of expressed communication between health and physical activity as in adulthood, as both in childhood and adolescent periods of life [8, 9, 10, 11]. So, according to Burhanov et al. (2006) [1], the average level of healthy children studied in public schools is approximately 11%, while in schools of sports bias this index is at the level of 17-18%.

According to several studies conducted by Lyah et al. (1992), Kopylov (1997), Nasoldin et al. (2001), Pagava et al. (2006), health decline, the level of physical development of modern schoolchildren are accompanied by deterioration in their physical preparedness [3, 5, 7, 9].

The purpose of study was to evaluate the significance of physical training (PT) for morbidity in children and adolescents studied in public educational schools of Tashkent city.

Materials and methods of research

Investigations were carried out in two public educational schools of Tashkent city (№29 and №249). The

school №29 (basic), on the basis of our proposals has been reorganized for physical training and rationalization of nutrient of children. In the school №249 (control school), the system of physical training and nutrition were not changed.

We examined 1426 students in the basic school and 1416 students in the control one. In each of the schools from the observed number of children and adolescents there formed four age-gender groups: boys and girls of 11-14 and 15-18 years old. According to «Hygienic requirements for physical training, sports equipment and tools in educational institutions of the Republic of Uzbekistan», reorganization of PT concerns improving the forms and tools, as well as the principles of PT, improving medical monitoring and optimization of working conditions on PT [2].

Evaluation of the rationality of changes in nutrition and PT system in children and adolescents studied in these schools, suggested by us, conducted on basis of comparative analysis of one of the most important indicators of children and adolescents health – their morbidity under the conditions of the initial and the modified nutrition system and PT (in the period between 2007 and 2008). Morbidity was studied on the basis of ICD-10 on the admissions to the polyclinics.

Results of research and their discussion

Table illustrates the common level of morbidity in children of the studied groups, based on the admissions data before and after the reorganization of PT (in 2007 and in 2008).

Morbidity rate in schoolchildren on admissions data before and after the reorganization of PT per 1000 children

Age groups	Gender	Basic group		Control group	
		2007	2008	2007	2008
11-14 years old	Male	297,7	181,8	216,0	257,8
	Female	224,0	138,0	197,3	229,0
15-18 years old	Male	361,4	243,0	308,7	328,9
	Female	220,2	161,8	184,6	225,6

These data indicate that during the traditional construction of PT (School №29) in all four age-gender groups by the end of 2008 year increased admission of children to the primary health care institutions (PHCI): in boys of 11-14 years by 19,5%, 15-18 years – 16,1%, whereas in girls of 11-14 years by 6,5%, 15-18 years – 22,2%.

A different picture observed in the schools, in which there were implemented the recommended by us measures on improving nutrition and PT system: in all four groups in 2008, morbidity on admissions significantly decreased: in 11-14 year boys on 38,9%, 15-18 years – 32,8%, in 11-14 year girls – 38,4%, 15-18 years – 26,5%.

Illness patterns in schoolchildren in both schools based on admissions represented 15 classes of diseases (on ICD-10). Prior to the reorganization of PT, the structure, and therefore the morbidity rate on disease classes in two groups had no significant differences. This is well demonstrated in Figure which illustrates the comparative structure of the diseases and shows that in 2007 in both schools for boys of 11-14 years old the first five places in the structure of diseases take such diseases as: diseases of respiratory organs (Class

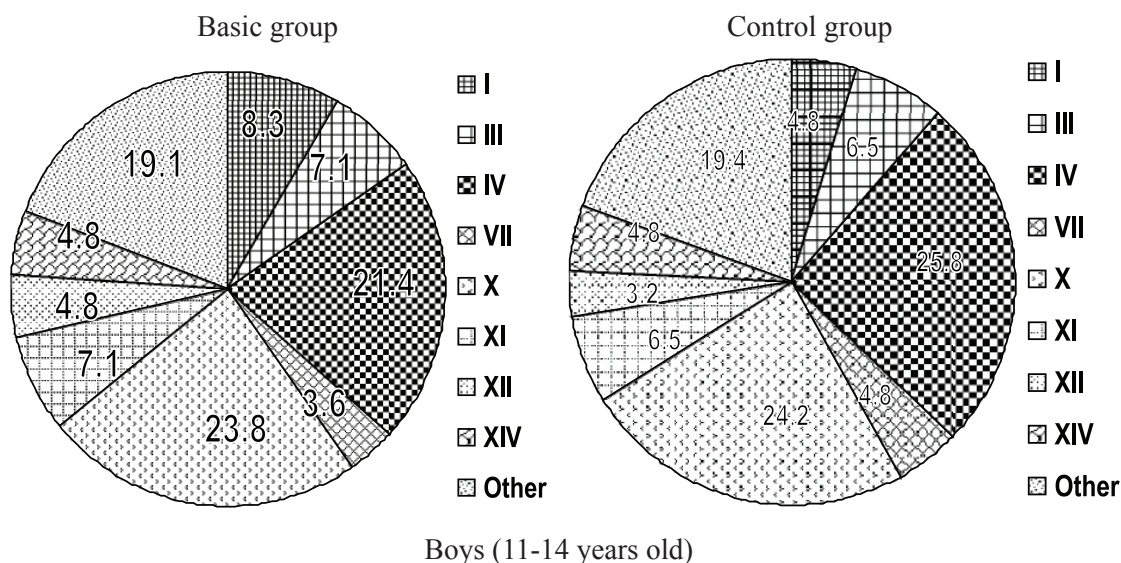
XI – 1st place), endocrine diseases and nutrition disorders (Class IV – 2nd place), infectious diseases (Class I – 3rd place), diseases of blood and hemopoietic organs and illnesses of digestive system (Class III and XI – 4th place), skin and subcutaneous tissue diseases and illnesses of genitourinary system (classes XII and XIV – 5th place).

Regardless the incidence of disease classes (per 1000 students), we revealed significant differences in this index for some classes of diseases in two groups for the period of 2007 and 2008 in all age-gender subgroups.

In 11-14 year boys of main group, the highest morbidity rate in 2007 was typical for respiratory, endocrine, infectious, and blood diseases (42,0; 42,0; 17,5 and 14%, respectively), and common morbidity rate was 297,7‰.

In control group, the highest level in this period was typical for endocrine, respiratory, digestive illnesses, diseases of blood and hemopoietic organs, skin and subcutaneous tissue diseases (62,7; 55,7; 13,9 and 13,9‰, respectively), and common morbidity rate was 257,8‰.

In 2008, common morbidity rate in boys of control group increased by 19,5%. In this connection, this rate increased for 11 of 15 classes of diseases.



Example of the structure of morbidity rate in schoolchildren of both groups (2007), %

The greatest increase in the morbidity was observed for behavior disorders and diseases of circulatory system (up to 2 times), and for skin and subcutaneous tissue diseases (increase on 98,6%).

In basic group, by the end of 2008 morbidity reduced on 38,9% due to 13 out of 15 classes of diseases. However, more significantly de-

creased the number of diseases of eye and its appendages (by 66,7%), behavior disorders, ear, digestive, skin and subcutaneous tissue, genitourinary system diseases (50%).

The situation was similar in the age group of 15-18 year boys: in basic group the total incidence at the end of the year has decreased by 32,8% due to 12 out of 15 classes of dis-

eases (mainly respiratory, skin and subcutaneous tissue, ear and mastoid diseases), whereas in control the common morbidity rate insignificantly increased (6,5%), but significantly increased levels of cardiovascular diseases (by 50,7%), trauma (32,7%), diseases of genitourinary system (25,4%) and ear diseases (20,2%), diseases of blood and hemopoietic organs (19,6%).

Described patterns of these changes in morbidity rate were confirmed in two age groups of schoolgirls. In the age group of 11-14 year, in 2008 indicated an increase in the incidence of admissions (by 16,1%), whereas in basic group this rate reduced by 38,4%. Reducing the incidence in this group is the most largely due to the decrease of digestive diseases (by 62,4%), diseases of the eyes, skin and subcutaneous tissue disorders (49%) and respiratory diseases (by 48,3%).

Girls of 15-18 years of basic group also positively responded to the conducted sanitary measures. However, these improvements were less significant than in the age group of 11-14 year: the level of common morbidity rate has decreased by 26,5% due to 10 out of 15 classes of diseases (most notably diseases of nervous system – on 49,0%, skin diseases – 44,3%, injuries and poisonings – by 39,8%).

In control group of girls at that age in 2008, incidence increased by 22,2% due to 12 out of 15 classes of diseases.

The characteristics of these changes in the morbidity of schoolchildren on admissions in basic and control groups suggests undeniable positively influence of nutrition and improvement of PT system on this indicator of the health of schoolchildren.

Along with this, in all age-gender groups detected issues on which should be paid attention during physical training – in boys and girls in 2008, both in basic and control groups increased the number of diseases of bone-joint system, muscles and connective tissue. We suggest that this can be conditioned by irrational choice of exercises or insufficiently developed technology of their usage.

Conclusions

1. The traditional system of physical training used in schools of Tashkent city does not improve the health of children and adolescents. This is, particularly, maintained by absence of positive dynamics (during the 2007-2008 years) in terms of morbidity on the admissions data. The above characteristics are present in all age-gender groups of studied schools.

2. The introduction of sanitary measures to rationalize nutrition and to reorganize physi-

cal training during the 2007-2008 academic years could significantly reduce the incidence of children and adolescents in comparison with the dynamics of indicators in the control group: the common morbidity rate in 2008 reduced by 34,2%, compared with 2007 year.

3. Reducing the incidence of students after the implementation of sanitary measures is mainly due to decrease in the incidence of eye, ear and mastoid diseases, respiratory, skin and subcutaneous tissue diseases, diseases of genitourinary, digestive system, and mental disorders. Most of these diseases are closely connected with the level of organism resistance. Hence, we can conclude that implemented sanitary measures have nonspecific effect on children and adolescents, increasing the resistance of their organism.

4. After the implementing sanitary measures in the school, an unexpected problem was revealed – the increase in diseases of class XIII (diseases of bones and joints). We suppose that this conditioned by the use of physical exercises, which do not take into account the intensive processes of formation of the skeleton at this age, that dictates the need for more careful selection of physical exercises.

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DIAGNOSIS OF DYSFUNCTIONAL LIVER CONDITION IN NEWBORNS AND THEIR CORRECTION

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Liver dysfunctional state in newborns with prolonged physiological jaundice manifested only by disturbance of liver excretory functions and is a compensatory stage of liver syndromes. Usage of Hofitol in infants with prolonged jaundice showed a significant trend of faster dynamics of reducing in bilirubin and cholesterol levels, alkaline phosphatase activity, and earlier clinical resolution of conjugation jaundice.

Keywords: newborns, jaundice, liver dysfunction, Hofitol

Currently, there are serious problems with the quality of health of fetus and newborn. Compared to developed countries, Volodin (2004) noted that infant mortality rates remain high [2]. In-depth study of the biological processes that ensure normal functioning of fetus and adaptation of newborn to external environment, as well as identifying risk factors for health in this important period of life are the real basis of prevention of various pathological conditions in children. Reducing the frequency of dysfunctional states of newborn, we can create conditions for a better prediction of health and development in the future. According to Wolyniec (2005) and Dementyev (2001), one of the organs, which are very often involved in the pathological process in various diseases in newborns, is the liver [3, 5].

Liver dysfunction in infants may be a consequence of the impact of various factors, both infectious and non-infectious, during fetal life and after birth. Intrauterine infection and sepsis can cause liver damage with the development of hepatitis and liver failure [2]. In the occurrence of dysfunctional liver condition in newborns may play the role such various pathogens as: *Listeria monocytogenes*, *Candida* fungi, paroviruses, enteroviruses, cytomegalovirus (CMV), rubella virus, etc. [1].

The following non-infectious diseases may induce liver failure: antenatal hypoxia, congenital heart disease with decreased cardiac output syndrome, carotid apnoea. According to some reports, a cause of liver dysfunction in neonates may be inborn metabolic disorders [11], in particular oxidative phosphorylation [8]. In newborns, there are no clear standards for determining liver dysfunction, no information on the epidemiology of this complication, no studies on clinical features of liver dysfunctional state have been conducted, and there is no standard therapy.

Objective: differential analysis of clinical and diagnostic signs in detecting hepatic dysfunction in infants with prolonged physiological jaundice and, based on these studies, to standardize therapy.

Materials and methods of research

We examined 44 children at neonatal age of gestation from 32 to 40 weeks with hyperbilirubinemia of conjugation genesis, who had received treatment in the Department of Neonatal Pathology of the 1st clinic of TMA. Selection of patients for the study was carried out on the basis of clinical and biochemical parameters, indicating impaired liver function. The starting point of a sick newborn screening for the study was the high level of conjugated bilirubin in blood serum, which is regarded as a sign of liver damage at any age [4].

Further, we conducted a longitudinal (prospective) study, i.e. dynamic monitoring of sick children during the entire period of the disease, with daily clinical evaluation, laboratory parameters, instrumental methods. There were determined the following biochemical indexes in the biochemical analyzer: blood bilirubin, total protein, albumin, prothrombin index, the activity of transaminases and alkaline phosphatase. In order to elucidate an etiology of liver dysfunctional state, by immunoenzymatic method there were examined such infections as: CMV, HSV, mycoplasmosis, chlamydia, *Candida* fungi, toxoplasmosis, adenovirus, etc.

Results of research and their discussion

Signs of liver damage were: early appearance of jaundice syndrome (up to 24 hours of life), later growth of jaundice (after 3-4 days), long duration of hyperbilirubinemia (>3 weeks), increased concentration of bilirubin in blood (more than 256 $\mu\text{mol/L}$), relative increase in direct fraction of bilirubin levels (15%), increased alkaline phosphatase activity. Liver ultrasound study showed in patients changes in the biliary system in form of thickening of gallbladder wall and heterogeneity of its contents.

The high level of indirect bilirubin in newborns as a result of increased erythrocyte hemolysis, or violation of its conjugation, causes toxic effects on many organs and tissues. Traditionally, neonatologists consider that indirect bilirubin is neurotoxic. However, there are other toxic effects of the biochemical substrate. Indirect bilirubin, as a hypolipidemic agent, in high concentrations has a toxic effect on kidney tissue, pancreas, heart, alters blood rheology. In particular, there is evidence that its concentration in blood serum

of more than 255 $\mu\text{mol/L}$ has a depressing effect on the immune system [6]. High concentrations of indirect bilirubin cause the violation of functional state of the left ventricular myocardium, which requires appropriate therapy [6]. Some researchers point to the possible impact of indirect bilirubin on the membrane of hepatocytes [7, 9]. From this standpoint, we can assume that changes in liver of neonates were due to toxic effects of indirect bilirubin in the physical and chemical properties of bile. One of the main reasons that causes a disturbance of bile formation is the change of cholesterol metabolism in hepatocytes or biliary excretion slowdown. Some researchers called this condition «the accumulation of bile syndrome» with some modifications in clinical terms – with the presence of hepatomegaly, hypocholic stool in a majority of newborns. In our interpretation, this phenomenon can be interpreted as a violation of excretory liver function (table).

The frequency of clinical-laboratory and instrumental parameters for liver function abnormalities in infants with prolonged physiological jaundice

Symptoms	Abs.	%
Jaundice (direct hyperbilirubinemia)	44	100
Indirect hyperbilirubinemia	26	59
Hepatomegaly	7	15,9
Ultrasound visualization of gallbladder and its contents	19	43,2
Ultrasound visualization of liver vascular system	3	6,8

Clinical-laboratory and instrumental data obtained in infants with prolonged physiological jaundice showed only a change of viscous-flow properties of bile: enhancement of its viscosity, sludge and reactive changes of the gallbladder.

One of the characteristics of children in newborn period is the relative immaturity of liver enzyme systems that ensure the capture of bile components of blood, their intracellular transport and excretion in the intrahepatic biliary system. Directly, in the biliary tract play a role the permeability of intercellular compounds, low cholekinetic activity of biliary system, and increase of reabsorption of bile components in intestine. Violations of the adaptation period of newborns, acute and chronic hypoxia, and associated perinatal pathology significantly lengthen the time of formation of these functional systems and can lead to an increase in the content of bile components in

blood, increasing the size of liver. Underlying these changes may be transient and destructive changes in the bile ducts, increased permeability of the membranes of liver cells.

A variety of causes, influencing on liver, during prolonged course of physiological jaundice in newborns create tension in the functioning of the hepatobiliary system. In turn, this naturally leads to disturbances of synthesis, conjugation, enterohepatic circulation, and excretion of bile acids. Any of these violations are conditioned in infants with abnormal liver function modified viscous-flow properties of bile and reactive changes of the gallbladder.

Classically, cholestasis is considered to be a stagnation of bile in liver, but in newborns with prolonged physiological jaundice, apparently, dominated bile sludge, not its expressed stagnation. This assumption is indirectly confirmed by the absence of hepatomegaly and short duration of liver dysfunction in most patients.

Thus, we can conclude that the morphological substrate for liver dysfunction in the examined infants with prolonged physiological jaundice is the only violations of the viscous-flow properties of bile and reactive changes of the gallbladder. Changes in hepatocytes, if they present, had not structural, but functional character with benign course.

Some drugs used in neonates with icteric syndrome, contribute to passage disorder of bile. Using many of choleric agents in neonates is limited. One of the restrictive aspects is that many cholagogue preparations contain dried bovine bile and, hence, the primary bile acids, whose formation at this age are so great.

To evaluate the effectiveness of pharmacotherapy for jaundice, patients were divided into two groups: 20 children of 1st group (control) received traditional treatment with phototherapy, infusion of 5% glucose solution, sorbents, Phenobarbital; 24 children of 2nd group (basic) additionally received Hofitol per os for 10 days, 3 times a day for 20 minutes before feeding of child in dose of 0,3-0,5 ml. Hofitol increases bile flow, reduces intrahepatic cholestasis, enhances liver antitoxic function, influences on the liver enzyme system [10, 12].

In 72,7% of newborns of control group was marked a tendency to a longer course of jaundice syndrome (more than 3 weeks). Duration of jaundice frequently crossed the border of the first month of life (in 17,3%). Decrease of bilirubin in this group was slow, and by the 20th day of life this index remained high ($187,3 \pm 4,5 \mu\text{mol/L}$). In basic group, where children additionally received Hofitol, there was a significant trend of faster dynamics in reducing of bilirubin levels in serum (up to $112,4 \pm 4,1 \mu\text{mol/L}$ by the 10th day of life), and earlier clinical resolution of jaundice con-

jugation (by the 14-16th day). Along with the normalization of the levels of indirect and direct fraction of bilirubin in newborns in studied group, there was observed a positive dynamics of indicators of cholestasis syndrome: reduced activity of alkaline phosphatase, and cholesterol content in blood serum.

Conclusions.

1. Liver dysfunctional state in newborns with prolonged physiological jaundice manifested only by disturbance of liver excretory functions and is a compensatory stage of liver syndromes.

2. In order to correct violations of the viscous-flow properties of bile and reactive changes of the gallbladder in infants, it is recommended to use Hofitol per os for 10 days, 3 times a day for 20 minutes before feeding of child in dose of 0,3-0,5 ml.

3. Usage of Hofitol in infants with prolonged jaundice showed a significant trend of faster dynamics of reducing in bilirubin and cholesterol levels, alkaline phosphatase activity, and earlier clinical resolution of conjugation jaundice.

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PURULENT BONE DISEASES CONDUCTIVE ANESTHESIA COMPLICATIONS

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An investigation of 538 patients with hand purulent diseases was carried out. A various novocaine concentration solution was implemented within a surgical interference. The control group patients took a conductive therapy with 2% solution, and the main group patients were treated with 1% solution, usage of which is more reasonable because of the complication lack within an anesthesia implementation.

Keywords: hand, phlegmon, anesthesia, novocaine

Acute purulent bone diseases (PBD) take one of the leading parts in surgical practice: frequency of hand felons and phlegmons vacillates from 15-18% to 20-30% [1, 4].

The correctness of implemented conductive anesthesia, regardless of in seeming simplicity, has a great influence on the disease flow dynamics. In literature one can find examples of skin necrosis and finger gangrene after usage of novocaine in combination with antibiotics and adrenalin usage [2, 3].

The objective of our research is: studying of the results of various concentration novocaine solution usage for patients with hand purulent diseases.

Materials and methods of research

Within the period of 2009-2011 in the purulent surgery division 538 patients with hand purulent diseases were treated. Among the patients the biggest part belonged to men within an age of 18-20 years old, women, because of the military specificity, equaled 6 (1,1%) cases. According to nosological forms the patients were divided as follows: felons – 277 (51,5%), abscesses – 147 (27,3%), and phlegmonas – 114 (21,2%) of the observations.

With felons most often the first hand finger suffers most – 127 (45,8%), the second – 97 (35,0%), the third – 41 (14,8%). More rarely lesions of the fourth and the fifth finger are registered – 9 (3,2%) and 3 (1,1) correspondingly. It can be explained by the greater functional strain and trauma frequency of the first three hand fingers. Ungual phalanx lesions was registered in 228 (82,3%), middle – 28 (10,1%), main phalanx – 21 (7,6%) of the observations. Within 10 (3,6%) of the patients a simultaneous lesion of two phalanx was registered.

In 147 (85,5%) of the observations abscesses were localized on a hand, within 115 cases (78,2%) – on a palm, and in 32 (21,8%) observations – on back surface. With phlegmonas a back hand surface was affected in 103 (90,4%) of cases, and palm – within 11 (9,6%) patients.

With felons in the main group ($n = 173$) under operative interference 6,0–8,0 ml of 1,0% of novocaine solution was used, the second group patients ($n = 104$) were treated with the same quantity of 2,0% novocaine solution. With ungula phalanx lesions within 228 patients (82,3%) a conductive anesthesia was implemented without placing a garrot on the main phalanx (if necessary, a pneumatic cuff was placed on a forearm).

Within the control group with abscesses in 37 (23,6%) cases and phlegmonas in 16 (10,2%) observations a local infiltration anesthesia by 10,0–30,0 ml of 0,5% novocaine solution was carried out. In the main group within 110 (28,9%) patients with abscesses and in 98 (25,7%) observation with phlegmonas, as well as under purulent process of the main and middle phalanx in 49 (17,7%) observation a conductive anesthesia by 3,0–5,0 ml of 1,0 novocaine solution on radiocarpal joint level, perineural to the middle, beam, and elbow nerves was implemented.

Results of research and their discussion

The anesthesia effect time in the main group equaled $6,5 \pm 1,34$ minutes, and in the control group – $6,9 \pm 1,08$ minutes. In all observation an anesthesia period was sufficient for an implementation of full surgical interference. In the main group no complications under anesthesia were registered. In the control group a finger angiospasm signals (skin whitening and lack of blood flow from the surgical wound) were registered with two women after the end of surgical interference. It provided for the reason of complex treatment of this complications (rheopolyglucene, trental, heparin, spasmolitics) and their dynamic tracking in the surgical hospital; conditions. After the implemented treatment angiospasm signes were removed and these complications did not affect the treatment results

Summary: thus, an implementation of 2,0% novocaine solution for conductive finger anesthesia under purulent – lesion diseases can lead to an angiospasm occurrence, and lead to a heavier complications and further hand disfunction without an opportune diagnostic.

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CREATION OF NEW ELEMENTS IN BLOOD OF THE PERSON AT CLONING

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Provides the information about new approaches to primary organ structure (blood) and a technique of health improvement of the person by changing element structure of Blood (cloning), the main element of blood is gold.

Keywords: new elements, blood of the person, cloning

At the cloning there is a recreation of elements. It is the same element, but «More qualitative». At first there was primary Na. After cloning there is a Na-polyester, i.e. is Na with another colouring system, i.e. the process capable to create «great of the simple» proceeds at cloning.

Primary sodium (Na) is a terrestrial structure. In a clone it gives itself in higher cleanliness «Na'» at the expense of reconstructing primary Na being the basis.

Na' possesses more powerful interaction with the solar energy. The more pure an element (Na), is the more powerful it is in solar energy reception.

At following cloning interaction of Na-primary and Na' will give Na''. I.e. the system of compound is a clarification. Primary Na does not exist anymore, it has reacted with Na' and all its actions have thus ended.

There was primary Na, then $Na_{burnt} = Na'$ (a clone №1) was added. To Na' Na'_p was added = Na''. Following clone Na'' will be being burned and we'll get $Na'' + Na''_{burnt} = patrix$.
 $Na_{patrix} + Na_{patrix(burnt)} = Na_{matrix}$

Patrix is a clone of new action, i.e. the primary Na does not give the Matrix and Patrix, they given by process of consecutive cloning.

Na-primary was weak as it was in operation. At the expense of addition of ashes food is given to it, sodium ashes enters into primary sodium, its «mentality» varies, i.e. the shift system where weak Na has lost in the force of Na (burnt) is formed. To primary Na food of a solar energy from Na (burnt) is given. To primary Na new energy inflow from different directions is given, i.e. it «bathes» in it. Before a cloning it had been weak, could not create optimum reception of energy. There is loosening of Na in «craters», other structure creates.

If primary Na in blood of the person were in an ideal, it would be not necessary to reconstruct. We admit Na is pure without blood clots. Its force had been spent too much, i.e. one of many works for four or five elements (which have left in blood clots). I.e. if Na was not in connection, it had been overload for those elements which were not in cleanliness. But if it was in connection it has not finished. Drink venous blood – its (element) feeding, i.e. cultivation itself! It is necessary for an element

which had been working for others because it is hardly live. To Na which is in a blood clot is only slightly sucking the «I» out from something (slightly), because it is in a blood clot. And in one (drinking venous blood) and in other (taking ashes) cases it eats, but differently. It has become stronger.

Drinking of venous blood gives a food to separate elements and that one's in blood clots, So, initial Na is not Na cloned for the fifth time. It is a new element.

Will names of elements change after its recreating?

Yes, but a basis is D.I. Mendeleev periodic system that will give new sprouts.

Future is a creation of the volume table of D.I. Mendeleev, it is our task today!

Having created artificial blood in 8-9 cloning, people will water the plants.

For example, you water a bulb, you grow it up then feed it to someone and it will be their feed Blood (element structure). But it is better to take burnt seeds again – there will be a vegetable or fruit cloned by their blood.

Each person will have own vegetable and tree (the clone watered). It is own products for everyone. But if you treat someone to fruit you will present a part of your blood.

Every morning if you wash the water cloned by blood ashes, your smile will always be happy! Such force there a clone 7-8 will be. Na has already the posterity twice.

People will exchange the ashes blood. To someone you give, and from it take. It forms development of own elements of blood.

The person is a constant reaction to something. To do something is organism reaction too.

So, its reaction is the head of all in the person.

1. Reaction is an influence of elements of blood on brain (blood on brain).

2. Reaction is a result of influence of brain on a body (brain on a body).

3. Reaction is a formation as a result of the action of new elements of blood.

Reaction is an interaction of different structures in chemistry, the physicist, genetics etc. in unity. The person is all sciences in unity. Chemistry, physics, genetics, a gene, result developments of a human society etc. It turns

out: for the sake of the person it is created as a whole planet the Earth. The most perfect creation on the Earth is a human being!

Through blood of the person the communication with the system of reasonable big force energy is carries out. Blood is a system that is called life for the sake of a life. If person does not have blood – he does not have a life.

Blood is a life reactor for everyone. The reactor is a basis for all and to all!!! Concept «The element structure of blood» – is various variants of a combination of person possibilities.

Those people who have integrity of a chemical compound of elements of blood are «Complete» people, healthy and in development. If the person has a maximum quantity elements of blood (integrity of a number), that means the person accurately forms the purposes and accurate carries it out, i.e. develops himself to the level which has been given him. Each person goals on the Earth are defined by element structure of blood.

Elements of person blood should be all in unity and at once, each of them carries the mission out. Elements are subdivided to destination:

1 – metals; 2 – gases; 3 – nonmetals; 4 those elements that turns to a blood clot because the connections which have got to blood; 5 – those elements that break blood clots; 6 – those elements, that divide all substances into connections etc.

Activity of elements depends on their constant action. But, some are medium or powerful force. The table on blood chemical elements it is necessary to make else this:

1 – metals – small on nuclear weight (lithium, beryllium, sodium, magnesium, aluminium, potassium, calcium...) – metals before gold;

2 – nonmetals (a pine forest, carbon, silicon, phosphorus, sulphur);

3 – gases – hydrogen (hydrogen, nitrogen, oxygen, fluorine, chlorine, helium, a neon, argon, krypton, xenon, radon...);

4 – metals which easily incorporate to oxygen, metals easily oxidized (Lithium, sodium, potassium, rubidium, caesium...);

5 – metals that break blood clots (mercury, lead...);

6 – metals that divide all substances and connections. They are «fighters for development» (manganese, magnesium, potassium, tin, iron, cobalt...).

There is a fighter «Manganese». It incorporates to Barium. It gives concept «well» and «Badly» to the person. Well – manganese is pure. Badly – manganese has incorporated to barium. If the elements that are located in the table before gold incorporate there can be concept «Badly» only, and if the elements af-

ter gold incorporate there is a concept «well» and making correct decisions to action. Association of elements before gold and elements after gold is a formation of possibility to make a choice between good and bad.

If the elements after gold are only unite the person comprehension of own greatness is formed. This is a condition of reevaluation of self-importance. Usually after such condition deep depression begins. It is hard to break a blood clot of the «overglory». This is a condition of «high flight», but actually there is no present development.

Understanding functioning of each element of blood of the person, we are approaching to understanding of the whole world.

Gold is the centre of reception of solar energy to blood of the person. When a person dies all elements in blood go out, because the main element gold does not submit a solar energy to it. Main energetic has disconnected system from energy feeding. The soul is the energy of a mind. It loses, when communication with heavens breaks off. To the person an energy for elements goes through the gold. If the program registered to the person is executed then giving solar energy to the gold is disconnected. It is the law of the world creation of the human on the Earth.

People! Protect gold of blood is a source of life.

How to protect gold to the person during lifetime?

1. Do not worry about another person. Everyone has the brain, and can't live by another's brain. Everyone creates it's own «I». What is «I»? It is quantity of gold in blood (this is main thing). If the blood of one is at another then it is already a blood clone, such people by birth are like twins. It is uniform on structure of elements blood. This blood can be drunk by each other and feel only delight and pleasure in an ideal. It is necessary to feed blood. Blood is a force, which is necessary to support.

2. Especially protect gold from chemistry.

3. The X-ray is a switching-off gold from energy of the sun for an instant completely, as short circuit. It shouldn't be done.

4. The ultrasound (ultrasonic) is a fast wave of a current. It is easier than the X-ray but is a shock for the person. The pre-natal ultrasonic is madness!!!

5. If we give to ourselves an electric current, creating the electromagnetic field, blood metals will reach for an electric current, not to the gold. That is the same if we try to «feed» «children of the gold» with other kind of energy. Gold will not forgive this. Gold will refuse to feed with their energy, and for life the person will feed them with other energy that is weaker a million times. If you start to feed the blood

elements with electric energy you mustn't ever stop doing it.

If you stop to feed elements of blood with electric energy, they will lose the force, and gold will never feed them. They will be strangers on energy. These elements of blood will be thrown, i.e. gold will not feed them, and feeding them with electric energy will bother person.

6. Gold mustn't be cut! To cut it is to divide it into pieces. It occurs at saving from clinical death with electric blow. If force of an electric current is several times much stronger than energy of gold of the person he as though will revive, but gold will break up. I.e. electric blow in heart splits gold and in the future organs which eat through certain elements of blood will receive an unbalanced power food, as gold particles at blow of electroshock turn out the different sizes. Large ones still work, small – do not. Gold splinters do not incorporate among themselves. So splinter is (a shock from a current) – so there will be a life and health of the person who has revived from an electroshock. If gold break up into very small pieces there is a time revival, if gold break up into the big pieces there is a life yet. Person life depends on gold in his blood!

How to increase concentration of gold in blood?

These are positive emotions for that: love, pleasure, laughter, kindness.

Let's start from the main thing: the love is a pleasure of reciprocal feelings. This concept – you are necessary to someone very much, it is very strong feeling! It is great pleasure of that comprehension, that the given person is necessary to you.

Gold transformation in blood of the person:

1. The love for a child is a formation and growth of gold of the microscopic size.

Tenderness to the child gives «back» for a birth of new atoms of gold. Love Children! They are backs for formation of new atoms of gold.

2. The love to the family is a quantity of gold grows on those backs, which were generated from love for children. Without it, i.e. without love to children there can't be love to Native (gold growth).

3. Gold is a love to everybody and to all!

4. The love between a man and a woman makes gold more brightly and saturated, i.e. the force of reception of solar energy increases. Love of sex is strengthening gold functions, but not weights.

So: the love can be different: memory and creative.

One + another = perfection of gold in blood of the person, perfection of the person as Persons.

What if the person does not love children? These people are made destitute by structure of the gold. They are people, whose gold growth is not formed on a life at all. These people were born with the certain structure of the gold given in a birth and also die with it. Remember: gold grows from


«Backs». «Backs» are a paternity and motherhood. The paternity is power in big gold outgrowths. Motherhood is true «backs» in a gold germ!


Therefore the paternity and motherhood are the most important acts on the Earth. It is gold growth in blood of the person. The civilization future depends on quantity of atomic and molecular structure of gold. No birth of children – no future (there is no development of structure of gold in the future blood).


The barrenness reason is a consequence of chemistry – formation of blood clots in blood, which do not give a food to a germ. Basically, the God gives conception by everything, but there is no present bearing, 2-3 days – and germ is gone. There is a concept – «I am infertile». It is not so. There is no present cleanliness of blood, it is in Blood clots. Create a clone of 4-5 times and there will be a happiness of motherhood. Any physical deviations in a uterus will escape. There will be a strong blood (without blood clots), everybody will give birth, who couldn't give birth!


What occurs to gold at cloning?


Structures of atom of gold vary depending on a cloning serial number.

 – A pyramid – atomic structure of gold in blood of the person;

 – Atomic structure of gold after the first cloning;

 – Atomic structure of gold after the second cloning;

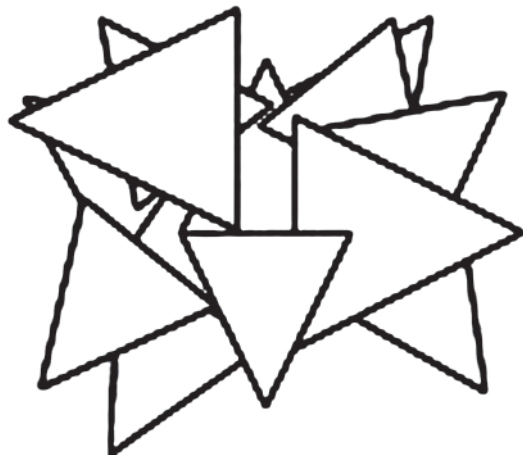
 – Atomic structure of gold after the third cloning;

 – Atomic structure of gold after the fourth cloning.

«Gold» after cloning does new by «me» to itself, i.e. gathers in an asterisk. Gold after cloning makes a new molecule of gold. Another's clone – Another's gold, It already the, i.e. at repeated cloning of «gold» – full is full. One shines, another – shines less, the third – shines

less. At each person gold incorporates in the molecule.

Own «gold» creates an outgrowth of atoms, i.e. the light (Figure) is created.



New kind of a molecule of gold,
that in a clone

How the molecule of gold of the subsequent cloning differs from the previous?

New one's more active, i.e. in structure of atom it increase by 1 whole, i.e. by 2 times, by 3 times, in 4 time – the weight of gold increases. «Gold reserve» is a life molecule. Not the form varies, but force of interaction with the solar energy varies. At the expense of what this force of interaction varies? It is the burnt and cooled system, i.e. gold had been cleaned, cooled and it has given a new charge. It is system the Earth – the Sun, i.e. it has been left on light that was in darkness.

After 15-20 clones the first-born atom of gold will be closed by new formations.

Organ which is a transplant, why does not it get accustomed in other body?

Using the transplants taken from dead people in a new body forms cells destroying own cells. The person use a transplant from the dead person, does not live long because the organ of the dead should be buried. There goes a con-

cept «different energy». One's for the native cells, another's for alien organ, it's an alien, two diverse energy cannot exist in one person.

To the person who has received an organ «in a gift from another» the death comes because two reasons: the allogenic organ dies; the person who has transplant organ dies.

The allogenic organ is an action of allogenic blood in other body. The body gives it their blood, but, the allogenic organ had a development in other blood and to accept new ones means killing itself. Another body (which the organ was taken) has own force of a magnet. Development of organs of each person depends on magnet action. Each person has his own force of an attraction on Earth. And each human organ is created for «one force of an attraction – the point». As «magnet» under the land it holds people. Where you are there your magnet is.

When the person is dead there is no magnet, and its action should be transferred to other «magnet».

One force of a magnet pulls another which is already dead. I.e. in a body of the person there is an organ, its force of a magnet (force of a life) had been killed, but there is no rest for it, i.e. a part of force of an attraction in operation.

The dead person which organ has been transplanted to another is neither live nor dead. The channel of a human life is not closed. There is a program failure on distribution of energy of the Heavens.

The solar energy makes organ work on that body which is no. And a new body, to which the organ has been replaced, cannot rejoice because energy of a life goes in organ and from it in a body of the dead person.

The person a constantly in depression, constantly think about the one who has died. It is terrible to carry «organ of the dead person» inside. It is a tipping over of energies of two people: live and dead. The force of live one is big, but there is a continuous communication with dead one making a power tipping over. Each person only energy is intended. Both persons should be live: the one who gives organ and the one who takes it.

BLOOD AS THE BASIS OF HUMAN HEALTH

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The information about new approaches to the structure of a human blood as well as a technique for improvement of the person health through change his blood elemental composition (cloning).

Keywords: blood, human, health

Blood is the system containing almost all chemical elements of the periodic system of D.I. Mendeleev (super system of the Universe chemical compound). It's man who creates this system with the help the hormones exit in blood and forms the ele-

ments mass composition; endocrine system is the creator of elements of D.I. Mendeleev table.

Blood has the following structure: blood atom (elements), kernel, blood cells (erythrocytes), leukocytes, thrombocyte (fig. 1-5).

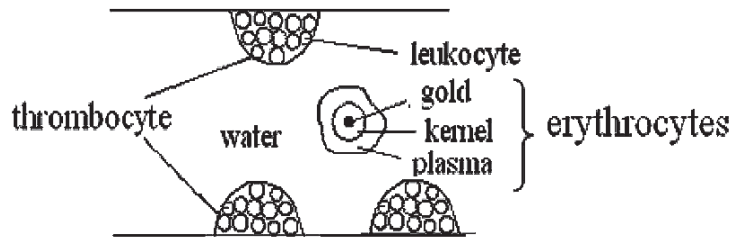


Fig. 1. Structure of blood

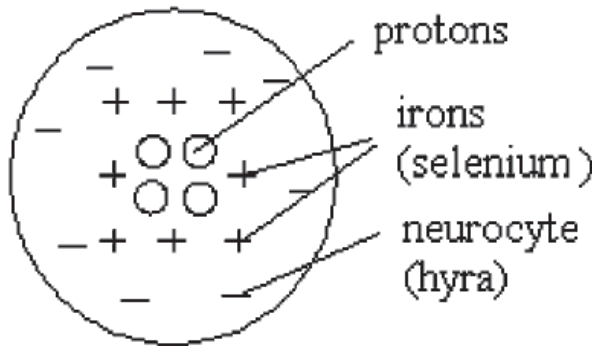


Fig. 2. Atom of blood (element)

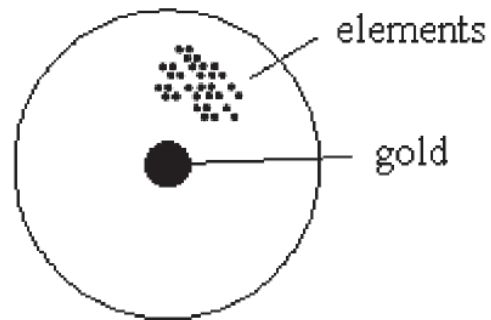


Fig. 3. Kernel

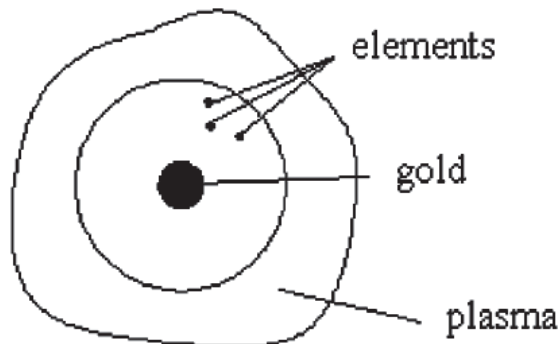


Fig. 4. Blood cells (cells – erythrocytes)

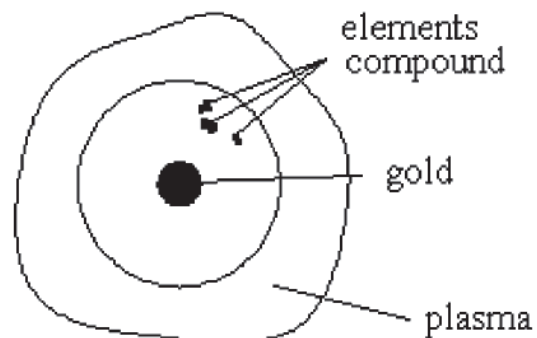



Fig. 5. Leukocytes



Blood plasma is the cleanest water molecules. Plasma (water) is a basis of thoughts acceptance by a person. A person has two phases of water in blood: pure ready for thoughts acceptance, and that one which has already fulfilled. The thought is accepted by a pure molecule which gives energy to blood and becomes «empty». It means that in blood plasma there is water which accepts thought and the one which has processed it. Plasma is the structure which provides acceptance of thoughts and their return. Quality of plasma (water in molecules, i.e. chromosomes) depends on the compound of a cell kernel. If the structure of a gene-element atom is wrong, then plasma provides wrong energy emission of a water molecule (chromosomes). It leads to a failure. Failure is an abundance of dead chromosomes (leukocytes). The conditions of thoughts nonconductibility in cleanliness are formed.

The main thing is to accept a thought. Thought is the energy. Energy is fundamental of physical body existence.

What if the person thinks much? What does it mean to blood?

The person accepts thought: blood creates cells growth active. This is both a force of a kernel and a force of plasma. Plasma action is a result of a blood cells kernel activity.

After reception of a thought the molecule develops it. Plasma provides a thought transition into action, a water molecule is developed (). Death of a plasma molecule occurs at night. It is the process of molecule turning into initial condition. The energy is taken away at night. It is a life law: give back what you have taken. In the morning the thought goes again. A water molecule rests at night. «Has died» is a rest. If the water molecule is curtailed it means that it does not create thought reception.

If people work at night they don't let the energy of thought to leave by force of their consciousness. This is the overtwisted «on the contrary» water molecule (). This is weariness and bad mood. This is not curved in norm molecule () and which cannot accept necessary quantity of energy again. It (water molecule) is abnormal, unrested; not bent for acceptance of new thought.

Interaction of all blood structures provides a human life. Red blood cells are molecules with pure elements. They easily create the elements connections corresponding to character of emotions felt by a person. These are correct atoms connections of a kernel of cellular (DNA) and it's a health of the person.

Blood clots are dead cells which do not receive energy of the sun.

Red blood cells are molecules which «float» in water. Their function is to take nourishment (elements) from food and transport them in blood. From any food created by nature a true (element) compound allocates in blood. A human blood «pulls» that is called «element cookery» from food in a stomach, i.e. microstructure created by energy of the sun. That which is not created by energy of the sun goes to a waste. Blood takes pure elements from food at first: these are natural products (without chemical additives).

Then blood pulls the compound of elements which has got to chemistry, and extends the elements from it, which have been already weakened by chemistry but still reacting to a solar energy. Weak elements create a weak food in blood, the strong ones – the strong.

The food in a stomach gives energy to an organism through blood, it is important by its energy, element structure, but not by weight. Red blood cells «transport» energy from food to a person's blood.

Perfection of chemistry system is processes of oxidation and restoration. Is everything in the nature except gold in oxides?

In nature everything is created in the form of different compounds. Cleanliness doesn't exist at all. Gold in absolute cleanliness can be only in blood of the person. True gold is only in blood of the person. So: everything on the Earth is compounds. A cleanliness of elements is only in blood but also blood is full of compounds (blood clots).

It is trouble that illnesses of our life do not give us pleasure of existence. There is a process of a science stagnation. There are no medicines which help at once and in everything, form lightness of body and pleasure of life. Burning process of everything and all is the help in struggle for health of each person. Having created ideal structure of blood it is possible to cure everyone who is sick. Blood ashes are concept of reorganization of its element structure. Blood, which is not ashy, only makes active atoms.

Average number of elements given in a birth is 67, 68 to 70. Less quantity of elements in blood means weak-mindedness usually.

Average system of elements development in human blood is to 72, but they seldom happen pure, a lot of them are in compounds. The work of elements in blood clots is weak. The absence of many blood elements is (leukemia). When 3–4 elements unite in a blood, it is small blood clots: it is revealed in the form of human aggressive reaction to any acts, deep mortification because of injustice etc. It is character. If people have a blood with 67–70 pure elements they will be great persons of goodness, mind and honour. There is small number of such people, they almost don't exist.

Elements, genes, chromosomes, hormones, transitions of one in another are obvious in science actions of one and the same: elements. Elements are blood basis.

Genes are abilities in the process person development.

Chromosomes (number) are diseases etc.

For people health improvement it is necessary to study a concept of blood atomic structure and structure of the pure blood full of all elements and without blood clots and to change these compounds by cloning. When carrying out cloning process a person takes 10 ml of venous blood. He drinks 3 ml in and takes 7 ml in atomic structure. The old blood cell remains in person organisms, and new one incurs everything new in a life. It means that tomorrow the person will become a man who doesn't know pain, illnesses, aggression and everything negative.

The clone is a powerful influence on change of blood compounds. Even within 2–3 days blood will be another, powerful. And the blood will operate better.

The cloning is a destruction of blood clots. There is its disintegration if blood clots are multilayered. The difficult multilayered blood clot is of 8–12 layers. Having cleaned 4 of them you almost forget about everything, but 3 will have an effect if suddenly the deformed molecule of water, peat, seed in maturing or a chemical preparation gets in meal. The blood clot starts to grow again. It is a concept «to break, but not to finish».

If the person blood is pure from a birth there is no blood clots, and a person makes reasonable actions. But, such blood now is a very little. Abundance of the pulled out in the childhood «measles» blood clots and their recreation gives furrows in vessels. This is the earlier action of staphylococcus.

In vessels a blood clot (fig. 6-7) forms in any time in its place. One has sat down in mother's womb. It means that it is grown in, i.e. it is impossible to tear it off. This is future character, whims, disobedience, aversion of parent thoughts in the childhood and adolescence.

If you take antibiotics they'll create entropy, i.e. suck in yourself that which is appeared to be poisoning for blood. However in a pure place antibiotics are not fixed, only on uterine blood clots. New blood clots create staphylococcus (inoculations against diphtheria, measles, typhus, tuberculosis). All other blood clots are created on their basis, i.e. on uterine and on inoculated. The generated more on weight in a blood clot pulls on itself, similar is drawn by the similar. Patrimonial (uterine) blood clots are very powerful. They are illnesses development of mother and her blood.

Huge blood clots are created by anaesthesia (narcosis). This is a murder of blood cellu-

lar compound (broken cells), they do not know where to disappear and gather in a huge group. After operation it is necessary to drink live or frozen blood.

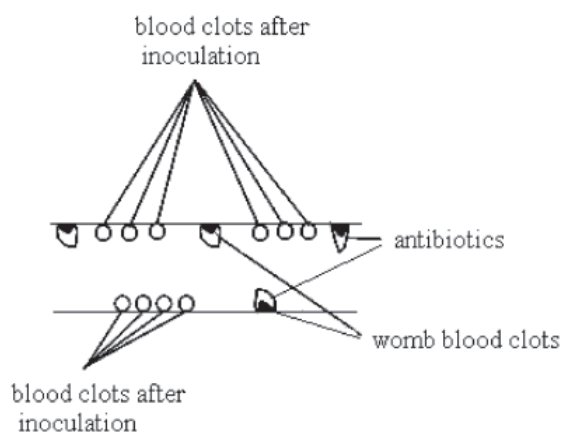


Fig. 6. Kind of blood clots

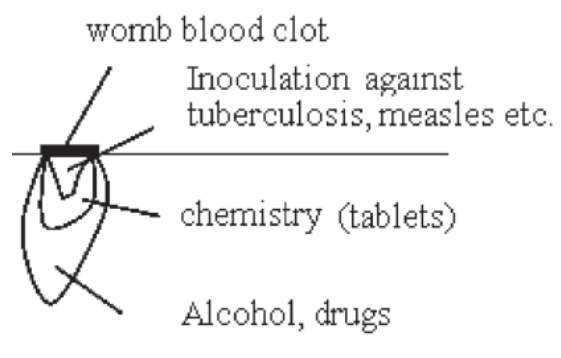


Fig. 7. Blood clots of the drug addict

Blood clots have their own history. Each blood clot is a way of selfnegation in human «I». The blood clot is a wrong action of the person. The blood clot is not developed concept of logic, thinking and the right to the «I». The abundance of blood clots speaks about person difficult character. It is a rage, insult, disappointment and chronic illnesses.

There are blood clots from a sin of thoughts in actions. There are blood clots from violence of someone's thoughts. There are blood clots from the superiority of thoughts about yourself and others. In chemistry this process is called «overoxidation». It is not a chemical reaction but disintegration one. In process of life it is easier for the person to create blood clots instead of breaking them. Negation of something in your consciousness can create the blood clot; praising of you is blood clots breaking. Praise more and more, only sometimes reminding, that the praise is for overcoming something in sincerity and from heart. It is concept of

cleanliness of thoughts, i.e. soul clarification, i.e. sincere concept of from what you have suffered. In life it is called soul clarification, i.e. a recognition to yourself or someone, that you are not right (repentance).

Blood clots multilayered. A blood clot is a compound. First of all it's feelings. Negative emotions are compounds of chemical elements before gold. The chemistry is created because of influence of various situations in a life on a brain, i.e. it is pleasure or on the contrary not pleasure. The pleasure is destruction of elements located before gold in compounds. It gives to the person concept well or bad.

In a life there is a lot of chemistry that all has mixed. Threading the elements in chemistry on a blood clot which created in negation increases a blood clot. If the person pleased but accepts chemistry blood still struggles, i.e. it creates a fight for true compound of blood (without blood clots). Love and pleasure break chemical compounds. It is possible because of person's creation of sincere desire to live in beauty. If all is bad for the person and he drinks chemistry the blood clot expands.

To clean a blood clot from chemical preparations they should be burnt and eaten. All blood clots to collapse.

If the person has such blood clots which are created quickly and powerful on force of coupling these blood clots give him jealousy. There are sensual blood clots and painful ones.

The sensual concern:

- Jealousy;
- Robbery;
- Sin of the sins. (murder of the person).

Painful blood clots concern blood clots which do not leave without clone action.

Sensual blood clots can be broken by own blood; to break painful blood clots the own blood cannot help.

Sensual blood clots can be broken by own blood. It is love, morning walk, holidays, creativity.

Painful blood clots can be broken only by cloning. Painful blood clots are terrible, huge, volume (i.e. very, very huge). It is suicide, murder, drunkenness with robbery (murder).

All people are ill, the healthy person is very unusual occurrence Those who makes blood for clarification from blood clots for itself will «reborn»! These people are very emotional. They are glad to all and everything!

Blood clots of the suicide and the murderer. The chemistry is a poisoning by poison (any). Poison (any) is not cleared in parent blood, it passes to the child. The child has been sick since a birth because of blood clot that has been made by the poison which has passed

from blood of mother. If poison of a natural origin (mushrooms, rotten berries, meat etc.) a person was born with thought of a suicide.

If it is a chemistry poison, he is the barbarian, an aggressor, the executioner, the despot, easier criminal (murderer).

To carry out health improvement people should be divided into 3 groups:

1. Aged people since 1 year till 12 years.
2. People since 12 years till 27 years.
3. People are more senior 27 years.

Group 1 – blood makes only growth of cells. There are no negative actions of cells. I.e. this group is not subject to a clone. But in cases when are spoilt (clots up) blood cells of children (narcosis), clone should be done. If do not create a clone for these children they will be cancer children in the further life. The killed cells in the childhood are a basis of cancer disease in the future.

Group 2 – basic age, i.e. there is an abundance of growth of hormones. Hormones are a chemistry of blood, i.e. it is all elements that have reached the optimum. The elements of young children as small as children are. Since 12 years a thinking development in development (awkward age), i.e. there is yield of a considerable quantity of hormones which answer for development of emotions. I.e. there is a growth of the elements which has been in a birth. The same is at a clone. It grows with new blood together. For this group (2) a clone can be done only if a narcosis was made. Other illnesses can be cured increasing dynamics of growth of blood cells (i.e. creating full compound of chemical elements) – drinking blood.

Group 3 – an ideal age, this age – «stop system», i.e. the blood cell has full structure and cell division till 33th years, then dying of blood cells advances their birth, i.e. after 33th years there is an ageing of the person. Till 33th years the blood cell did not die, but only have division, after 33th years the destruction mechanism joins. Now the clone is necessary. The Christ's age (33 years) is the ideal age of a maturity of a blood cell. If till this time (till 33th years) illnesses narcosises and an abundance of antibiotics were, blood had blood clots. These years you can drink blood and burnt products and pharmacological preparations. Without clone.

If there is an early clone the person cannot create the «I», i.e. the «I» will start a new re-birth. It will be mentality another, he/she is the person changes itself. But if till 27 years the person has been having an abundance of blood clots (i.e. antibiotics, nerves etc.) and alcohol the person is more senior 33th years. Treatment of blood by a clone is necessary.

CAUSES OF HIGH NOISE LEVEL IN CITIES OF KAZAKHSTAN

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In this article an information on the causes of high noise level in Kazakhsatn cities is provided as well as on the role of transport noise in the process of city environment formation. The development of all transport means, transport ways has led to the fact that a man is constantly exposed to an impact of high-level noise. It is known, that the main factors that alter a noise regimen of the city transport flow are the traffic character and the content of a transport flow, traffic intensity and speed. Noise is dependent on planning solutions (longitudinal and transversal streets' profile, height and intensity of building) and such convenience elements as road coating and a presence of green planting. The main reasons of high noise level also are: micro-district and block territories are not isolated from the penetrating noise from arterial streets, a significant part of territories that are supposed to be recreation area or children playgrounds, are used for transport movement.

Keywords: noise level, Kazakhstan, city

Scientific-technical progress that leads to the acceleration of social-economic society development, including an improvement in labour conditions and a men' household, sometimes carries potential danger of an aggravation of harmful factors' impact in connection with their intensiveness and prevalence. To these factors we can rightfully refer urban noise [1]. Technical industry and agricultural complexes' rearmament, increase in transport movement speed, introduction of technical means that facilitates and hasten intellectual labour, development of household technics, etc. led to the transformation of urban noise into an ecologically-significant factor of city environment [2]. Urban environment includes a multiplicity of technical constructions, transport ways, industrial, sports, and municipal objects that are active noise sources [3].

Noise levels in dwelling places from different sources reach some quite high indexes: elevator noise while closing – 90 dBa, rubbish chute – 83 dBa, washing machine – 82 dBa, child cry – 80 dBa, sound of music in a room – 78 dBa, entrance door shutting – 78 dBa, phone talk – 75 dBa, water flush in toilet – 70 dBa [4]. However, the main reasons of urban noise are, first of all, transport noises (automobile, railway, and aviation).

Transport noises in cities grow every year, as power of cargo machines and the unber of transport units annually grow on arterial streets. In big cities transport noise grows in average by 1 dBa per year [5]. In rush hours noise reaches 100 dBa on intense city arteries, and in dwelling apartments and work places – 60-85 dBa. The concept of «urban transport noise» is more equalized with the idea of «arterial streets noise». The highest noise levels are being registered on cities' arterial streets. Average traffic intensity reaches 2000-3000 transport units per hour and more, and maximum noise levels – 90-95 dBa [6].

Noise background of arterial streets is dependent on traffic intensity, content of cargo

transport in traffic, especially those with diesel engines as they are the noisiest ones; movement speed; longitudinal streets' inclination; condition of road; rail transport presence [7]. Each of the described factor itself can alter a level of transport noise within the limit of 70 dBa[8].

Transport noise level on a distance of 7-25 meters from the road equals 70-85 dBa. This noise put more than 25 % of people who live in apartment, oriented to streets, into unsatisfactory life conditions [9]. According to E.S. Pronin, the area of dwelling micro-districts and blocks that are exposed to intense transport noise impact, reaches 50 % [10].

Noise in apartments with open windows that are oriented to streets, is only 10-13 dBa lower than average noise level on a road [11].

The main sources of the «pollution» of a man's habitat in dwelling are: penetrating noise from transport arteries, work of engineer sanitary-technical equipment (elevators, rubbish chutes, fans, pumps, etc) [12].

Noise causes tiredness, source of which is in consumption of great quantity of psychological energy for, so called, defense braking of nervous system [13]. Under terms of continuous impact it becomes one of the major and most harmful sources of nervous and psychological diseases [14]. A lot of works, especially clinical, provide results of investigations on the impact of high power noise irritants (90 dBa and more) upon the functional condition of a man, especially his hearing aid. Research by I.L. Karagodina showed that a noise impact on a man begins at its level of much lower than 65 dBa. Depending on the informative content of noise, personal condition of a man, and a great number of other parameters, unfavourable effect of noise upon a man's hearing aid starts at the level of 50 dBa, and its impact upon his psychology – at even lower noise [15]. Noise can affect not only a man's work process, but also his rest, sleep, disturb oral communication,

harm hearing, and cause other physiological reactions. Particularly, it hasten gerontological processes in a man's organism, and, what is typical, noise affects the whole organism, not only hearing aid, as some people think, as its impact indirectly reduce the general resistancy of an organism against pathogenic factros of a man's environment [16].

However, a study of diverse character of urban and dwelling noise impact upon an organism meets significant difficulties that arise in relation with their complicated interaction with other physical and chemical factors of our environment, and also because of individual sensitivity to a noise impact of different people [17].

According to the data of research, carried out in Germany and Great Britain by P. Ising and co-authors (1997), transport noise that exceeds 65 dBa leads to chronic stress, and can even cause death. The risk of heart disease development in this case increases by 20%. Under the noise level increase up to 70 dBa the risk equals 30% [18].

Studies, carried out by W. Schade [19] on analysing noise levels in four European cities (in Germany, Switzerland, Netherlands, and Italy), showed that noise pollution is a widespread problem. The author investigates environment and noise pollution from three positions: subjective population attitude to noise, protection of dwellings that are situated along roads, and fighting noise via legislative acts and laws at the governmental level. The population of these countries suffers from pollution, caused by transport: 17% in Italy, 40% in Netherlands, 64% in Switzerland, and up to 70% in Germany. More than 50% of these countries' population are disturbed by the noise of air transport. Noise is the third in the list of environment pollution factors in Europe. In the same article W. Shade provides data o noise level condition in developing countries (India, Pakistan). Regardless of low traffic intensity, noise level in these countries is significantly higher than in industrially-developed countries. Average noise level within a day equaled 80 to 92 dBa, the highest index was 140 dBa.

G.L. Osipov claims that the present trend for a noise level growth in modern cities will remain urgent within the next 40-50 years. He also underlines that current technical abilities of transport means' improvement are yet not able to secure the necessary clearness of atmosphere and noise level decrease, that makes the problem of environment protection in cities even more acute [20].

Researches, carried out by us on the evaluation of urban noise regimen in Kazakhstan Republic (Temirtau, Schuchinsk, Ust'-Kamenogorsk) showed that the major sources of urban noise are means of traffic movement, industrial enterprises, railway, airports, and other places

of massive people accumulation (entertaining complexes, cafes, restaurants, other nterprises of trade and sport complex) that corresponds to researches of other Kazakhstan authors [21, 22].

In terms of cities' building territories the main impact upon the noise regimen have urban transport arteries of different purpose. Noise that emerges on an artery road, spreads not only into the adjoining territory, but also deep into a dwelling. Thus, under the terms of the highest noise impact located parts of blocks and micro-districts that are placed alongside street arteries of municipal importance.

Traffic intensity on street arteries at the moment of research in cities Temirtau, Schuchinsk, Ust'-Kamenogorsk equaled 185-950 units per hour. The heaviest traffic of public transport (buses, trolleys) was registered on arteries of municipal significance.

A dependence has been revealed, according to which an increases in cargo automobiles' content in traffic and their movement speed, especially those with diesel engines, leads to a dramatic growth in the noise level that considerably projects out of an artery noise background in form of noise peaks. The highest equal sound level from 72,4 to 76,5 dBa was registered in sections of high-speed roads. Minimal equal noise level (56,3 dBa) is character for dwelling streets, where traffic is relatively even (passenger transport).

Dwelling streets within inter-arterial territories are free from transit transport. Here only insignificant traffic of passenger and, rarely, cargo transport was registered. Equal noise levels are 58-60 dBa, that exceeds sanitary regulations and rules («Protection from noise», level of noise pressure within building area must not exceed 55 dBA during the day and 45 dBa in night hours).

The analysis of transport noise range showed the maximum of noise energy in intervals of low (63 Hz) and middle (500 Hz) frequencies. The heist significance in the formation of noise range has the composition of traffic. Under an increase in content of big cargo machines with diesel engines the range moves into the area of middle frequencies, noise harm for the population grows.

It has been set, that urban noise that reaches high levels, because of its low-frequency nature, can spread far outside the borders of arterial streets, easily overcoming obstacles. That is why urban (transport) noise can transform into the major and continuous part of the adjoining territories' acoustic environment. Noise freely penetrates dwelling, administrative-public, cultural-entertaining, trade centres and territories from roads, considerably exceeding sanitary regulations (SNiP -3677-84). The most uncomfortable in acoustic meaning is the functional area of 7,5-25 meters from roads in

all studied cities. The highest equal noise level from 7 a.m. to 8 p.m. was registered on territories of the main avenues in cities Temirtau, Schuchinsk, Ust'-Kamenogorsk.

The definition of transport noise spreading index from roads showed that at the distance of 15 m from an artery the noise level oscillates from 46,5 to 70,3 dBa, 30 m – 45,6 to 60,1 dBa, 60 m – from 45,2 to 49,1 dBa.

Noise levels at distance from 7,5 to 15 meters from roads deep into dwelling buildings decreased within 0,1-6,8 dBa, in other words, stayed the same. It can probably be explained by the lack of green plantings and large area of adjoined asphalted territory. Noise attenuation at distance from 15 to 30 and 60 meters from an artery was more intense. Thus, at the distance of 15-30 m noise level decreased by 7,4-10,8 dBa, at the distance of 30-60 m – by 11,2 dBa. Noise decrease from the standard point (7,5 meters from a road) led to its alteration at the distance up to 60 meters by 22,5-24,6 dBa.

Exceeding of acceptable noise levels near automobile arteries was observed in a daytime, the highest indexes were registered within the period of 7 to 11 a.m., and also in «rush hours» from 6 to 7-30 p.m.

Thus we have found out that the main factors that alter noise regimen of urban traffic are traffic character and transport flow structure, its intensity and speed. All these indexes usually are variable. For example, the number of transport units per hour is dependent on an artery bandwidth, time of the day, day of the week, and other conditions of cargo and passenger flow on a given direction.

The transport means' combination is also impermanent: speed is dependent on the number of transport units per hour and also on the traffic organization terms, road condition, presence of crossroads, their technical solution. Since the noise from traffic flows can alter significantly, the noise regimen in the adjoining territories (micro-districts) will alter correspondingly.

Thus, a level of street noises is defined by an intensity, speed, and character (content) of traffic. Besides, it is dependent on planning solutions (longitudinal and transversal street profile, building height and density) and such convenience elements, as road covering and presence of green plantings. The major reasons of high noise level are also the following: territories of micro-districts and blocks are not isolated from the noise, penetrating from roads, considerable part of area that is supposed to be recreation territory, is used for transport movement, especially for riding motorbikes and scooters. Urbanization, violation of sanitary regulations, formation of low and middle frequency sound waves, alterations in transport composition in favor for big cargo

machines point out the danger of further noise level growth in big cities.

Considering the described, further investigation of noise in other Kazakhstan Republic cities is an urgent problem for the development of legislative documents, aimed for the solution of the noise problem and also short-term and long-term preventive programmes for non-admission of ecologically-determined diseases development, decrease in pathology growth and transfer of present diseases into chronic form.

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HEART RATE VARIABILITY AS A PREDICTOR OF ADVERSE PROGNOSIS IN PATIENTS WITH UNSTABLE ANGINA PECTORIS AND CONCOMITANT DIABETES MELLITUS

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To assess informative value of heart rate variability (HRV) parameters in late-term prognosis in patients with unstable angina pectoris and concomitant type 2 diabetes mellitus. 31 patients with newly diagnosed and progressing angina pectoris followed-up for 2 years were examined. Upon 24-hour monitoring disorders in heart rate and conduction as well as heart rate variability parameters were assessed. Fatal and non-fatal myocardial infarction, sudden death, emergent rehospitalization were among the adverse outcomes. For patients with both adverse and favorable courses statistically confident differences were observed in minimum heart rate values ($P = 0,039$) and SDNN5 ($P = 0,04$) by the 2nd week of treatment. $SDNN < 68$ ms ($\chi^2 = 2,97$, $P = 0,046$) and $SDNN5 < 30$ ms ($\chi^2 = 2,97$, $P = 0,046$) were shown to serve as predictors of the disease unfavorable course revealed on the 2nd week of treatment. $SDNN > 98$ ms ($\chi^2 = 4,4$, $P = 0,036$) registered by the 2nd week of treatment turned out to be limit confidently discriminating patients with angina pectoris adverse and favorable course. ECG Holter monitoring results, parameters characterizing HRV, in particular, can serve as additional predictors of adverse prognosis in patients with UAP and concomitant type 2 diabetes mellitus.

Keywords: unstable angina pectoris, type 2 diabetes mellitus, ECG Holter monitoring, transitory ischaemia, heart rate variability

Association of unstable angina pectoris (UAP) with high risk of myocardial infarction and lethal outcome because of ischaemic heart disease (IHD) makes researchers pay more attention to risk stratification of UAP patients to assess both early and late outcomes [1]. ECG Holter monitoring is a method for risk stratification of myocardial infarction survivors. Studies in patients with UAP are scarce, their findings being discrepant [2-7]. Studies on the problem in UAP patients with type 2 diabetes mellitus are even scarcer [8].

Our study aimed at assessment of informative value of heart rate variability (HRV) parameters in determination of late-term prognosis in patients with UAP and concomitant type 2 diabetes mellitus (type 2 DM).

Materials and methods of research

The study was open, observational with retrospective analysis. We followed-up 31 patients referred to Ischaemic Heart Disease Department at ... with diagnosis of IHD, unstable angina pectoris.

Typical manifestations of UAP onset or progression in compliance with the European Society of Cardiology recommendations [6] as well as presence of registered type 2 DM (WHO, 1999) were the criteria for inclusion.

Acute myocardial infarction (AMI) for less than 3 months, type 2 DM severe decompensation requiring insulin therapy, III-IV functional class chronic cardiac insufficiency (CCI), coronary arteries revascularization in medical history as well as severe hepatic and renal dysfunctions met the criteria for exclusion.

Mean age of patients was $54 \pm 1,08$ year. Acute myocardial infarction (AMI) and arterial hypertension were found in medical history of 65,8% and 52,4% of the examinees, respectively. Type 2 DM and IHD duration was $5,4 \pm 0,69$ and $6,3 \pm 0,88$ years, respectively.

The study included one in-patient stage (I) and three out-patient stages to follow up the patients after discharge for 14-15 days (II), for 1 month (III) and for 3 months

(IV) with 12-month and 24-month periods of further clinical follow up.

All patients had their demographic IHD risk factors and clinical characteristics, such as, pain syndrome dynamics a week before hospitalization, as well as hemodynamic parameters, such as heart rate (HR), systolic (SBP) and diastolic blood pressure (DBP), left ventricular systolic and diastolic parameters and resting ECG monitoring assessed. All patients underwent 24 – hour ECG Holter monitoring (ECG HM) within first 24 hours starting from the moment of inclusion into the study. Disorders of cardiac rhythm and conduction as well as heart rate variability (HRV) parameters were assessed in 24-hour monitoring. Patients with complex cardiac rhythm disorders were excluded. We assessed time and geometric characteristics of HRV, including SDNN (ms) – Standard Deviation of Normal-to-Normal RR intervals, SDNN5 (ms) – Mean of the Standard Deviations of all Normal-to-Normal RR intervals for all 5-minute segments, SDANN (ms) – Standard Deviation of Averaged Normal-to-Normal RR intervals, PNN-50 (%) – Percentage of differences between adjacent NN intervals that are > 50 ms, HRV_i – Heart Rate Variability triangular index (standard units), RMSSD (ms) – the square Root of the Mean of the Sum of the Squares of Differences between adjacent RR intervals [9]. Data on patients with the assessed myocardial infarction episodes in the form of depression or ST segment elevation, constituting separate part of the study were published earlier [10].

Complete lipid profile was determined by standard methods [11]. Friedewald formula was used to measure concentrations of low density lipoprotein (LDL) cholesterol [11]. Fasting and postprandial glycemia as well as glycated hemoglobin were the carbohydrate metabolism parameters to measure [12, 13]. Upon discharge all patients had their IHD clinical course, ECG HM and blood glucose assessed.

Basic therapy included anticoagulants (heparin) (100%) at the acuity, aspirin (100%), beta-adrenergic blockers (100%), nitrates (95%), APE inhibitors (95%) and atorvastatin (100%). To correct carbohydrate metabolism all patients received glybenclamide in the dose $5 \pm 0,25$ mg/d. By the end of 2-year follow-up the pa-

tients were divided into 2 groups. Patients with the disease favorable and adverse course were included into the 1st ($n = 21$, 67,7%) and the 2nd group ($n = 10$, 33,2%), respectively. Fatal and non-fatal myocardial infarction, stroke, sudden death, emergent rehospitalization were among the adverse outcomes. Three patients had non-fatal acute myocardial infarction, urgent revascularization due to unsatisfactory drug therapy being performed in one, angina destabilization episodes with the transfer to lower functional class taking place in seven.

The results were processed with the standard analysis of variation by means of Student test for quantitative parameters and χ^2 criterion (Statistica, version 6,0).

When searching for prognostic criteria of the unstable angina adverse outcome we looked up to statistical parameters flagging confident intergroup differences in a characteristic frequency of occurrence in the groups compared (in terms of χ^2 criterion) as well as to maximum value of occurrence ratio reflecting discriminating power of the characteristic analyzed. Intergroup differences were confident at $P < 0,05$.

Results of research and their discussion

Patients of both groups were comparable by the IHD precipitating signs (table).

Incidence of IHD adverse course factors in patients with UAP and concomitant type 2 DM with favorable and adverse outcomes, abs (%)

Sign	All patients (%)	1 st group	2 nd group	χ^2	P value
AMI documented in medical history	19 (64)	11 (54,2)	8(80)	1,472	0,225
Arterial hypertension	17 (54)	12 (57)	5 (59)	0,00	0,9
Dyslipidemia	25 (80,6)	16 (76)	9 (85)	0,179	0,672
Smoking	23 (74,1)	15 (70)	8 (81)	0,005	0,944
Age > 60 years	7 (22,5)	4 (18,7)	3 (30)	0,179	0,672
Type 2 DM duration 5 and more years	18 (58)	10 (47)	8 (81,2)	1,739	0,187
LV hypertrophy (ECG signs)	12(38,7)	6(30,9)	6(61)	1,651	0,199
SBP > 160 mm Hg (at hospitalization)	10(32,2)	6(28,6)	4(42,1)	0,051	0,822
DBP > 100 Hg (at hospitalization)	10 (32,2)	6 (28,6)	4 (42,1)	0,051	0,822
HR > 90 beats/min (at hospitalization)	13 (41,9)	9(42,5)	4(30,4)	0,157	0,811
Cardiac rhythm disorders requiring antiarrhythmics	0(0)	0(0)	0(0)	0(0)	0(0)
LV systolic function (EF < 40%)	0(0)	0(0)	0(0)	0(0)	0(0)
Patients with UAP	31(100)	21 (67,7)	10 (32,2)		

Note: EF – ejection fraction;

* $P < 0,05$ statistic significance in relation to the group of patients with the disease favorable course.

As per results of ECG HM performed basally, that is, at the disease acuity in patients of two groups, respectively, mean minimum HR values were $53,1 \pm 2,41$ and $53,6 \pm 4,41$ beats/min ($t = 0,11$; $P = 0,9$), mean maximum HR values being $104,7 \pm 2,52$ and $103,0 \pm 4,9$ beats/min ($t = 0,34$; $P = 0,73$), mean SDNN values were registered $97,5 \pm 7,25$ and $90,7 \pm 13,65$ ms ($t = 0,46$; $P = 0,63$), mean SDNN5 values being $47,2 \pm 4,38$ and $39,1 \pm 4,95$ ms ($t = 1,12$; $P = 1,12$); mean SDANN values were $91,4 \pm 5,19$ and $85,1 \pm 11,61$ ms ($t = 0,58$; $P = 0,57$), HRVi being $418,9 \pm 45,65$ and $415,1 \pm 58,39$ standard units, ($t = 0,05$; $P = 0,96$). Thus, no HRV parameter documented basally demonstrated statistically confident differences in the mean values above.

Results of ECG HM performed on the 2nd week of treatment (2-week ECG HM) showed statistically confident differences in two mean values of parameters between patients of the 1st and 2nd group. These were mean minimum HR

($50,7 \pm 1,15$ beats/min in patients with the disease favorable course versus $56,1 \pm 2,74$ beats/min in those with the disease adverse course, $t = 2,16$; $P = 0,039$) and mean SDNN5 ($52,0 \pm 3,68$ ms in the 1st group patients versus $38,1 \pm 2,28$ ms registered in the 2nd group patients, $t = 2,15$; $P = 0,004$). A tendency to statistically confident differences between patients with the disease favorable course ($114,1 \pm 9,82$ ms) and those with the adverse disease ($87,8 \pm 11,45$ ms) was found in SDNN dynamics ($t = 1,6$; $P = 0,12$).

Due to variability of the values no confident differences in other parameters registered at this stage of observation were registered. Thus, mean values of maximum HR were $103,6 \pm 1,82$ versus $99,7 \pm 13,65$ beats/min ($t = 1,103$; $P = 0,28$), mean SDANN values being registered $97,9 \pm 4,59$ ms versus $81,1 \pm 11,38$ ms ($t = 1,65$; $P = 0,11$); mean HRVi values were $413,7 \pm 362,9$ standard units versus $354,1 \pm 46,01$ standard units ($t = 0,95$; $P = 0,35$).

Analysis of values obtained basally demonstrated absence of any informative HRV markers to predict IHD adverse or favorable course.

2 weeks later SDNN < 68 ms was registered in 30% of patients with the adverse IHD and in none of those with its favorable course (0%, $\chi^2 = 2,97$, $P = 0,046$). Similar regularity, that is, 30% (2nd group) versus 0% (1st group) was established in SDNN5 dynamics (< 30 ms).

2 week ECG HM registered SDNN > 98 ms happened to be upper limit confidently discriminating patients with the IHD favorable and adverse courses. It was established in 57,4% of the former and only in 10 patients of comparison group (10%, $\chi^2 = 4,4$, $P = 0,036$), that is, 5 times less frequently. Thus, SDNN turned out the most valuable for differentiation of patients with the disease favorable and adverse courses.

When searching for detrimental IHD markers we found out that the parameters of an organism's system activities abnormalities of which could be easily explained from the disease pathogenesis point of view are of ultimate interest. Parameters of cardiac autonomous regulation are among them. To assess cardiac autonomous regulation we used ECG Holter to study heart rate variability. In previous publications [10] we managed to demonstrate that in the non-diabetics with unstable angina pectoris frequency and character of transitory ischaemia are independent of HRV, in the presence of diabetes mellitus and reduced HRV mean duration of painless ischaemia being two times greater than the one of painful myocardial ischaemia. As to mean values of all time HRV parameters, no differences between the group of UAP patients with diabetes mellitus and the one of UAP non-diabetics were found, though *a priori* we expected to observe more marked disorders of autonomous heart rate regulation in the former. The findings are a continuation to the analysis of data obtained as a result of 2 – year follow-up of the patients and the disease course.

As per results of ECG Holter performed in patients of our sample basally, that is, at the disease acuity, we failed to discriminate patients with the disease adverse and favorable courses. This can be possibly associated with the necessity to take into account on the day of hospitalization too many factors affecting the parameters to be studied in a patient with acute cardiac crisis.

Following the grouping of patients as per 2-week ECG Holter monitoring results confidently higher HRV values in the 2nd group patients were registered indicating predominance of sympatheticotonia in this category.

In addition, mean SDNN5 values turned out confidently lower in the 2nd group than in the 1st one to be the evidence for HRV reduction. SDNN < 68 ms and SDNN5 < 30 ms discriminating patients with the disease adverse and favorable course turned out cut-off minimum values registered almost in one third of patients with the adverse IHD, but in none of those with the disease favorable course. SDNN > 98 ms, registered on the 2nd week of observation, turned out the upper limit confidently discriminating patients with adverse and favorable IHD. It was established to occur in more than a half of patients with favorable course, that is, 5 times more frequently than those with adverse IHD. Closeness of the parameter to favorable prognosis cut-off value (100 ms) obtained in other categories of patients [15, 16] is possibly the evidence for universality and high practical value of the parameter in risk stratification. SDNN is a universally recognized parameter with the highest specificity and sensitivity as compared with other IHD lethal outcome predictors [14]. ECG Holter monitoring started in patients with unstable angina pectoris within first 24 hours after the last pain attack demonstrated all HRV time parameters confidently lower than those in healthy subjects of the same age and closer (though somewhat higher) to those observed in persons suffering myocardial infarction.

Conclusions

1. Analysis of basal ECG Holter monitoring parameters detected no informative HRV markers to predict either adverse or favorable IHD course.
2. Assessment of ECG Holter monitoring performed on the 2nd week of treatment showed intergroup differences in mean minimum values of heart rate and SDNN5,
3. SDNN < 68 ms and SDNN5 < 30 ms turned out cut-off minimum values discriminating patients with IHD adverse and favorable course after angina pectoris destabilization.
4. SDNN > 98 ms registered by the 2nd week of treatment turned out high limit confidently discriminating patients with angina pectoris adverse and favorable course.

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*Materials of Conferences***NEW ASPECTS OF PATHOGENESIS
AND THERAPY OF WET BRAIN
AND PULMONARY EDEMA**

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At older persons with a diabetes 2 types quite often arise a acute pulmonary edema. Along with other factors it is connected with insufficiency of adsorption-transport function of erythrocytes. Insufficiency of this function quite often arises also in 2-3 weeks after a serious cranio-cerebral injury. Insufficiency reduces anti-edemas potential of blood. Additional preventive actions and updating of the basic treatment algorithms accordingly are required.

Some features of adsorption-transport function of erythrocytes concern the mechanisms regulating hydration of tissues. This function, first of all, is connected with adjustable adsorption of various substances on erythrocytes surface and their transport to mural layer of blood capillaries. Substances «transported» to mural layer gain a possibility to participate in transcapillary and tissue exchange, to enter into content of interstitial fluid and lymph [1].

It's known that erythrocytes rotating and deforming can relatively easily come through tighter than their own diameter, artery part of capillary. At the same time substances absorbed on erythrocytes, mix and partially replaced by substances of the parietal exchange layer of blood capillary. Our research shows that adsorption – desorption are regulated processes. Thereafter, artery-vein difference in quantity of adsorbed substances is being changed by various influences. It is always positive along with glucose, showing the partial exit of the substance absorbed on erythrocytes from blood to tissue. Instead of retreated glucose, mostly proteins are being adsorbed on erythrocytes surfaces. Thereafter, concentration of protein in wall layer of capillary venous part reduces. On level of venous part of capillaries and venules the concentrate of protein gradient is shifting and correspondingly diffusion-vesicular return of protein increases from interstice to blood. Oncotic pressure in plasma is increasing and oncotic pressure in interstice is decreasing. The content of plasma protein is closely related to adsorbed protein quantity. By increasing of adsorbed protein the part of them shifts to plasma. Thereafter, «filtrate» of interstitial fluid transfers into blood flow. This mechanism is increased by volume gain (as well as adsorbed area of erythrocytes) of carbon dioxide saturate in erythrocytes. The ability of erythrocytes assistance in above mentioned protein return is a part of a general blood anti-edema potential. Glucocorticoids, catecholamines and some other hormones «removal» part of proteins and

other substances from erythrocytes surface and increasing oncotic blood pressure.

Osmolar – oncotic plasma pressure – is the base for blood anti-edemas potential. According to our concept, this potential includes the ability of erythrocytes to assist the return of protein from interstice into blood. There are also other constituents: processes of water linking by protein and other macromolecules of blood, proteolytic and lypolytic processes on the erythrocytes surface, processes of formation and destruction of protein-lipids and other complexes, aggregates [1, 2]. Also the main component of blood anti-edema potential is hormones, which regulates «removal» of protein, glucose and other substances from a erythrocytes surface into plasma. Hormones also are being transferred on erythrocytes surface. In other words, our blood anti-edema potential concept includes not only commonly admitted plasma oncotic pressure. This concept also includes the morpho-functional blood feature, which can affect dynamically to the pressure.

In lungs, at saturation erythrocytes by oxygen the area of adsorption decreases. This feature compensates relatively high level of metabolic cost and consumption of glucose in lung tissue. Ability of lymphatic system for resorption of water and protein from tissue is limited [2]. Therefore, in cases decrease of energy metabolism and glucose utilization in lungs, the risk of genesis acute edema of lungs raises. The possibility of acute edema of lungs emergence raises with age, also with diabetes 1 and 2 types, hypothyroidism, hypoproteinemia, anemia and some other pathologies, when under different causes the protein adsorption on erythrocytes surfaces decreases or general organism energy metabolism decreases. Therefore, for acute edema of lungs emergence risk reduction some actions are necessary, which increases metabolic cost in lungs. At adsorption- transport function of erythrocytes insufficiency, there is a necessity for treatment actions of this insufficiency.

The causes of acute edema of lungs emergence are well known. Among reasons generally define cardiovascular (aortal and mitral heart diseases; heart arrhythmia etc.) and not cardiac causes (hepatic and kidney pathology; severe chest injury; hemorrhagic shock etc.). Other reasons also exist which increases filtration pressure in lungs capillary (hypervolemia, hypoproteinemia etc.). At hepatic insufficiency, pneumonia and some other pathology an accompanying insufficiency of adsorption-transport erythrocytes function may happen.

The ability of substances adsorption on erythrocytes directly connected with quantity-quality rates of endoglobular hemoglobin. Adsorption of substances on the erythrocytes surface is decreased by connection of hemoglobin with glucose and some other substances. Therefore, therapy of adsorption –

transport erythrocytes functions insufficiency should include impact and drugs with hemoglobin regenerating attribute. There are a lot of known impact and drugs for different anaemias therapy. At the same time rehabilitation of hemoglobin functions also includes usage of antioxidant and organism sanitation. Glucose is linked with erythrocytes hemoglobin strong enough. Therefore, one of the first aid methods is the replacement of donor part erythrocytes with high or normal active (not glycosylated etc.) hemoglobin content. In all cases, when adsorption-transport erythrocytes functions insufficiency is poorly affected by therapy, donor erythrocytes or donor blood is required.

It is also timely at 2-3 weeks of therapy of severe cranio-cerebral injury. To the number of actions on prevention and therapy of deficiency we include: old erythrocytes extraction with further injection of erythropoiesis stimulator or injection of donor erythrocytes. According to our data, at slowing-down of utilization of old erythrocytes, positive effect can be achieved by Dorokhov antiseptic use (ASD-2, second fraction)

The question of utilization increase of glucose in lungs, require clinical approach and additional research. Probably local substances inhalation, stimulating metabolism (analogs of existing thyroid gland hormones and other drugs), will raise energy metabolism only in lungs. Influence on specified biologically active points of lungs meridian also can increase energy processes in this organ.

«Stress – regenerative» reaction was evolutionary generated in organism to cranio-cerebral injury, directed for recovery of injured tissue and dysfunction. With availability of initial «health reserves» total metabolism increased many times with body temperature raise, additional glucose intake, intensification of «receipt» glucose from lipids and proteins etc. In this case utilization of glucose in brain tissue is on the highest level. This also could not exclude appearance or increase in adsorption-transport erythrocytes functions insufficiency. Thereafter, many appropriate comments and suggestions according acute edema of lungs also directed to brain tissue edema. It is important to mark, very often in 2-3 weeks after serious craniocerebral injury emaciation of above mentioned protective-restorative reaction begins. Therefore, possibly, in this case it is necessary to maintain the necessary level not only glucose, but also appropriate «stress» hormone. Among them, according our data, we should draw attention on dopamine (Dopaminum). This hormone, according to animal experiments, shows evident effect on «hormone mobilization». This effect is very similar according to observation of astronauts at land day [3].

Return of protein from interstitium to blood flow with above mentioned mechanism – is relatively slow process. The decrease in adsorption-transport erythrocytes functions itself is not an underlying cause of acute edema of lungs, brain and

other tissue and organs. Offered actions – this is just an addition to well known treatment algorithms.

Our research in applied aspects in adsorption-transport erythrocytes functions [4], undoubtedly, can be accelerated by cooperating with other organizations. Additional financing required.

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OVERWEIGHT AND OBESITY IS MODERN PROBLEMS IN DEPRESSIVE DISORDERS

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Continuous growth of overweight and obesity in the world, the European region, including the Russian cities is marked. Some psychiatric disorders, in particular depression are connected with obesity. Our preliminary data has shown that depression with bulimia or with binge-eating, low self-esteem, difficulties in social adaptation were found out in 53,9% of women among 359 who sought for psychotherapy care.

Overweight and obesity often lead to health disturbances. By the calculations made in 2005 by World Health Organization 1,6 billion adult people in the world have overweight and 400 millions suffer from obesity. It is predicted that by 2015 these figures will increase up to 2,3 billion and 700 million respectively. The sharp growth of the number of people with overweight and obesity in the countries with low and middle income, including Russia, especially in city areas, is registered [9]. Overweight and obesity contribute to a large proportion of diseases shortening life duration and adversely affecting the quality of life. More than one million deaths related to excess body weight in the WHO European Region [2].

Purpose. The analysis of various data about overweight, obesity and depression.

Methods. Short polemic clinical overview on depression and overweight.

Overweight and obesity can independently cause conditions with life quality decrease owing to

restriction of contacts (stigma of obesity), inertness and hypokinesia in the way of life (fast fatigue), experiences of distress from an image of a body and mental and behavioral disorders, in particular anxious and depressive [3].

It is supposed that overweight and obesity may be also connected with psychological and emotional problems [5]. Recently the idea that fatness could play an important role in the psychiatric nomenclature has been discussed. Researchers have shown high levels of fatness among people with disorders of food behavior, food excesses, unipolar depressive disorder and etc [7].

In a problem of the specified interrelation of depression and fatness, there is no unequivocal position. It is offered to divide all research works into three levels. Many researches in which frequencies of the general psychological functioning, concerning to depressions and anxiety in persons with excessive and normal weight were compared, did not often find certain distinctions in these two groups on psychological parameters. However, transcultural comparisons showed the expressed distinctions at these conditions and the negative relation to corpulent people. Tolerance of people with excess weight varies from resistance to negative estimations to their physical image and habitus to extreme degree of vulnerability. The second level of the approach suggests carrying out research which would begin with risk factor estimation model. This approach presumes to identify persons who suffer from their fatness in interrelation with features of psychological functioning. Thirdly, the following generation of researches is recommended. For these researches the establishment of pathophysiological mechanisms which would connect fatness with certain experiences of distress or mental disorder is offered [3]. However, there are several assumptions that fatness and problems of psychosocial and mental health are connected. Recent papers add evidence to previous work linking social network structures and obesity. Social capital and social stress are additional types of social influence [6]. Our preliminary data has shown that depression with bulimia or with binge-eating, low self-esteem, difficulties in social adaptation were found out in 53,9% of women among 359 who sought for psychotherapy care [1].

In this direction the problem of studying of the depressive disorders prevalence in obesity also develops. Thus, the given researches and the authors' points of view can be various or complementary [2, 3, 8, 10].

Secondly, interventions directed to bodyweight decline may be included in complex treatment of psychiatric disorders taking to the account the frequency of depressive and bipolar disorders. In groups with various characteristics psychosocial problems, low level of social support, problems with mental health, low self-respect and the self-esteem, low level of average life duration, subthreshold depressive mood are marked [8].

Conclusion. Excess weight and obesity increase has epidemic character worldwide as non infectious condition. Craftiness of obesity is in its accruing comorbidity with depressive disorders that undoubtedly reduces quality of a life and obviously would essentially raise the mortality.

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MODERN APPROACHES TO AN ESTIMATION OF EFFICIENCY OF SUPERVISION OVER CHILDREN FROM RISK GROUPS ON TUBERCULOSIS DEVELOPMENT

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VI group supervision the account at phthisiatricians is formed by data tuberculin tests. Being based on the immunological data, the standard approach to supervision over it was effective in 20% of cases. At 20% of patients initial indicators of immune system at children at the moment of removal from the account remained. In 60% dynamics of immunological indicators isn'ted, but it hasn't led to homeostasis restoration in an organism. On the basis of the discriminant analysis of immunological variables objective criteria of prophylactic medical examination of children of VI group of risk on de-

velopment of a tuberculosis are developed. Depending on the received result it is offered to change approaches to prophylactic medical examination with application therapies immune preparations.

Children, having a bend tuberculins (tub) of tests or papule of 17 mm and more on tuberculin, concern risk group on development of a tuberculosis (TUB) and form VI group supervision («Д») the account. The basic criterion of their capture on the account and removals is change tub.sensitivity, tests Mantou defined according to test with 2 tubunits (TU). About «bend» tub.tests, transition before negative reactions in positive, increase tubsensitivity for a year on 6 mm and more testifies. During «Д» supervision patients receive antitubercular preparations (ATP) in a combination with vitamins and preparations for liver improvement [1]. At removal from the account 2 figures (millimeters) received in the beginning and the end «Д» of the period are compared. Reduction of the size of papules by 1 mm and more in aggregate with absence change under the roentgenogram of bodies of a thorax regard as good effect of prophylactic medical examination [2]. It is known that results of reaction of Mantou are influenced by an accompanying pathology, features of the food, transferred sharp infectious diseases, etc. Thus aren't excluded false results [2, 4]. Considering that test of Mantou is allergic reaction of IV type and defines not Mycobacteriae tuberculosis, and sensibilisations to it T-limphocity [3], we found possible to study a condition of immune system (IS) and to offer objective criteria of prophylactic medical examination.

Research objective. To develop objective criteria in vitro for an estimation of efficiency of prophylactic medical examination

Materials and methods. On the basis of STPE TA «Regional antitubercular clinic» (Tyumen) in 2004-2008 is carried investigation of children at the age of 10-15 years at which at carrying out tub-diagnostics at planned medical inspections in educational institutions of Tyumen «bend» tubtests or reaction on tuberculins 17 mm is fixed. 2 groups on 86 patients, at the moment of a capture on the account (1st group) and after removal from the account in 12 months (2nd group) are generated. Control (3rd) group included children of corresponding age not ill infectious diseases within 6 months which do not have a chronic pathology and not reacting on tuberculin, ($n = 15$). To all patients it is spent radiological and tomographics inspection for exception TUB. During time «Д» supervision to all children reception PTP (an isoniazid – 5-7 mg/kg or an isoniazid-5-7 of mg/kg + pirazinamid-20 of mg/kg) is appointed within 3-months. Recommendations of the doctor are executed in 76,7% (66 patients) that is designated by a letter «A». Didn't accept ATP 23,3% (20 patients) – letters «B».

Immunological inspection is spent to 10 children before appointment ATP in 1A to group, af-

ter removal from the account (2A group). B a research course are defined formulas blood, immune kind lymphocytes (Lymph) on cytophyuorimets (FACScan) by means of monoclonal antibodies (the LTD. Sorbent, Moscow) to molecules CD3⁺, CD4⁺, CD8⁺, CD20⁺, CD16⁺, to differens antigens (CD5⁺, CD7⁺), to activation markers (CD25⁺, HLA-DR⁺) and adhesions (CD54⁺), to apoptosis molecules (CD95⁺), to receptors to IgE (CD23⁺), on membranes of monocytes (CD14⁺). Defined concentration IgA, IgM, IgG (on Manchini) and the general IgE (in reaction IFA). A method **precipitation** defined level of circulating immune complexes (the CIC of 3,5; 5 and 7,5%). Functional condition phagocytosis cages estimated by definition of their absorbing ability with latex particles (PHC), and also biocidal activity of phagocytes (in spontaneous and stimulations the test of restoration nitrodark blue tetrzolium – NDT) and completeness degrees phagocytosis (CDPH). Studying interleykins IL-1 β , IL-2, IL-4, IFN – γ spent method IFA. Statistical processing of results carried out by means of the software package (SPSS Inc.) for basic researches.

Results and discussion. In group 1A decrease in results of reaction of Mantou is revealed in 39,4% (26 people), increase in 25,8% (17 people) and absence of any dynamics in 34,8% (23 people of the people). In 1B to group papule decrease took place – 40% (8 people), increase of 20% (4 people) and absence in dynamics tubsensitivity – 40% (8 people). It is established that dynamics tubtests didn't depend on reception ATP. Reaction of Mantou was the functional test reflecting condition IS during the given period «Д» of the account.

During the discriminant analysis from 37 analyzed indicators in the beginning and the end of prophylactic medical examination at the patients who have received ATP, it is chosen only seven (table). According to the one-factorial analysis authentic distinctions are fixed among indicators of the general level of Lymph ($p = 0,005$), Lymph with receptors CD7⁺ ($p = 0,002$) and CD95⁺ ($p = 0,007$), concentration IgE ($p = 0,038$), IL-2 ($p = 0,025$). The maintenance of a cortisol and absolute indicators neutrophils didn't differ between groups.

In comparison with control group patients 1A groups had low level CD95⁺ a receptor on Lf ($p = 0,007$), and at children 2A groups decrease in an expression of receptor CD7⁺ on Lymph is fixed. This receptor was costimulating for IL-2 and its receptor (CD25⁺). I.e., after reception ATP, operating on Mycobacteriae tuberculosis the factor, activation IS didn't come.

It is known [5, 6] that at a tubercular infection development Th2 of a way of the immune answer is possible. Indirect criterion of it was indicator IgE. Concentration IgE in 1A to group authentically above, than in 3 group whereas in 2A to group it was noticed a tendency to decrease that testified to decrease in activity Th2 of a way as a result therapies which were ATP. Thus, level IgE completely

wasn't restored to values in 3 group. Cortisol production influenced not only activator presence, but also duration of infectious loading. Concentration of a cortisol increased eventually from the moment of a capture by the account and after carrying out of preventive course ATP. We regarded this fact as result of adverse events for an organism: activator introduction (MBT), reception ATP and, as consequence of it, infringement of a homeostasis which took place in a current of long time (to 12 month).

At patients with changed tuberculins sensitivity at the initial stages «D» supervision are found out level increase neutrophils, Lymph and decrease in cages, expressions molecules (CD7⁺) at hypoproduction IL-2 and hyperproduction IgE. Difference between groups in the beginning and the prophylactic medical examination end was high level of a cortisol at patients at removal from the account. The chosen indicators reflected links immune pathogenesis a tubercular infection.

Statistical data of variable patients in groups with change tuberculins sensitivity

Changes	Group of patients	N	Average value of an indicator	A deviation of Std	An error of Std	Of 95% a confidential interval for average		Minimum	Maximum
						The bottom border	The top border		
Neutr, abs	1A groups	10	2889,4	1189,9	376,3	2038,2	3740,6	1300	4620,2
	2A groups	10	2488,1	607,2	192,0	2053,7	2922,5	1680	3337,0
	3-я groups	15	2579,1	705,5	182,0	2188,4	2969,8	1287	3600,0
	Total	35	2641,8	839,1	141,8	2353,5	2930,0	1287	4620,0
Lymph, %	1A groups	10	45,2	16,8	5,3	33,2	57,2	23,0	77,0
	2A groups	10	41,7	8,8	2,8	35,4	48,0	24,0	54,0
	3-я groups	15	42,9	5,9	1,5	39,6	46,1	33,0	49,0
	Total	35	43,2	10,6	1,8	39,6	46,8	23,0	77,0
CD7 ⁺	1A groups	10	76,8	3,3	1,0	74,4	79,2	73,0	82,4
	2A groups	10	73,8	4,8	1,5	70,4	77,3	67,8	80,8
	3-я groups	15	80,0	4,0	1,0	77,8	82,3	72,2	85,3
	Total	35	77,3	4,8	0,8	75,7	79,0	67,8	85,3
CD95 ⁺	1A groups	10	39,5	9,4	3,0	32,7	46,3	16,9	50,1
	2BA groups	10	43,8	7,9	2,5	38,2	49,5	32,5	54,0
	3-я groups	15	50,9	8,2	2,1	46,3	55,4	33,3	63,6
	Total	35	45,6	9,6	1,6	42,3	48,9	16,9	63,6
Ig E	1A groups	10	165,6	192,7	60,9	27,8	303,5	7,6	496,2
	2A groups	10	115,8	111,6	35,3	36,0	195,6	3,1	367,0
	3-я groups	15	38,1	22,6	5,8	25,6	50,6	6,9	102,1
	Total	35	96,7	127,9	21,6	52,8	140,7	3,1	496,2
Kortizols	1A groups	10	387,7	103,0	32,6	314,0	461,3	256,3	596,0
	2A groups	10	447,1	123,2	39,0	359,0	535,2	318,7	599,2
	3-я groups	15	384,6	92,3	23,8	333,5	435,7	265,7	524,0
	Total	35	403,3	105,5	17,8	367,1	439,5	256,3	599,2
IL-2	1A groups	10	98,7	128,6	40,7	6,7	190,6	0,0	342,2
	2A groups	10	38,3	48,7	15,4	3,5	73,2	0,0	114,5
	3-я groups	15	167,8	268,2	69,2	19,3	316,3	0,9	1000,0
	Total	35	110,0	194,0	32,8	44,4	177,7	0,0	1000,0

Considering that all received variables had various units of measure and have been non-comparable among themselves, we have transformed their true values in good, proceeding from a general average of set and a standard deviation. Each variable didn't possess authentic values. About efficiency of reception ATP we have received exact enough forecast on the basis of the further carrying out of the discriminations analysis when separate indicators, and their set were estimated not. Definition of initial discriminations functions (IDF) has allowed to formulate the formulas, allowing to define an accessory of the patient to this or that group. On the basis

of IDF it is revealed that under the immunological data among patients with indicators, characteristic for the period after reception ATP (2A group – 60%), were persons, with the data peculiar 1A to group (20%) and 3 (20%). In 91,4% initially generated groups are classified correctly, and at cross-country-checked research – 74,3%. Desirable effect of prophylactic medical examination was definition of children 2A groups in 3rd group on immunological positions at removal from the account that testified to homeostasis restoration. Unfortunately it we have reached only at 2 of 10 patients, and 6 from 10 needed term increase «D» the account since dy-

namics of restoration of immune system was outlined, but has not been completely reached.

The conclusion. By data tubtests with 2 TU us it is noted authentic distinctions in dynamics of the sizes of a papule at patients 1A and 1B groups. Application of reaction of Mantou as criterion of efficiency «D» the account didn't reflect a full picture of interaction macro and a microorganism. It was the functional test and a marker of immune dysfunctions. Because results tubdiagnostics are defined by two versatile indicators: a condition **infected** and an immunoreactivity condition, they should be read in aggregate with indicators **IC**. Among the immunological indicators distinguishing groups among themselves, low level of Lymph with receptor CD7⁺ at patients 1A groups and decrease in Lymph, expreccing molecules CD95⁺ isn'ted at removal from the account. IDF can be the objective test for an estimation of efficiency of application ATP. Proceeding from the aforesaid, the papule on 2 TU PPD-L can't be the only thing and (or) the basic criterion of diagnostics of a latent tuberculosis and efficiency of preventive actions. Alternative tubdiagnostics for an estimation of efficiency of application ATP can be IDF as the objective test which is carried out in vitro.

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LEAN-TECHNOLOGY APPLICATION IN DIAGNOSTIC PROCESS

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The pace of modern medicine development demands the innovational ways of diagnostics and treatment. A new type of relations between a doctor and a patient is developing and a patient gets an opportunity to choose his special doctor and the diagnostic method too. However, it leads to inefficient use of time and financial resources: the load on the diagnostic department and a specialist doctor increases, the patient's way to a correct diagnosis and treatment lengthens. Modern diagnostic department is a high-technology equipment and complicated diagnostic methods. It's necessary to take clinical aspects of the disease into consideration and to be aware of various opportunities of laboratory and instrumental examination methods, to be able to interpret the data. The doctor-consult of the diagnostic department possesses this knowledge.

A system that allows to remove «pain points» of the diagnostic process was designed, it is based on applying the principles of lean production – logistics concept work that involves improving internal processes while enhancing customer and staff satisfaction.

At the first visit of the patient the consultant physician of the diagnostic department makes a plan and a timetable for the survey on the basis of complaints, anamnesis and objective examination and helps the patient to realize it as soon as possible. According to the data of examination the need of any specialist doctors is determined. Thus the diagnostic department staff is free from performing extra procedures and a specialist doctor consults an examined patient. The system allows the patient to pass all the diagnostic procedures he needs and to get the conclusion of his clinical diagnosis and recommendations about treatment in short term and to avoid spending long time, extra physical and financial resources.

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Short Reports

**A NEW METHOD OF TEETH TREATMENT
AFTER THE RESORCIN-FORMALIN
METHOD**

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One of the main problems in the periodontitis treatment is the impassibility of the root channels. This can be often observed on teeth that had been treated with the resorcin-formalin method earlier. In this case the method of re-treatment of teeth that had been treated with resorcin-formalin earlier introduced by us appears to be one of interest.

The method is carried out as following:

Within the first visit after the removal of the filling material from the tooth space a maximum possible channels cleaning is carried out, and after that Endosolv(R) is left inside the channels or on estuaries under a temporary bandage for 24 hours. After that the temporary filling is removed and the channels are un-filled with the ultrasound down to the apical opening, the mechanical preparation of the root channel to the standard of at least ISO 40 is carried out, the channels are treated with the liquid «Merassul», cleaned, and dried. Next, calcium hydroxide is placed under the temporary filling for 10 days. A preparation «Gepon» is introduced into the root channel with the channel-filler after the temporary filling removal, but not more than out of the apical opening, and is left under the temporary bandage. Three days later the temporary filling is removed, the channels are cleaned, dried, and filled according to the common method.

Of 120 patients the described method was implemented within 60 patients, and the rest 60 formed the control group that has been treated with the traditional method. 55% of the control group patients felt pain while biting in the treated tooth area within 4-5 days. Patients that had been treated with the described method had no pain feeling or discomfort later. Within a control inspection a year later within 12 patients (12%) a periodontal fissure increase has been registered as well as the nidus of the bone tissue and apical root parts vacuum. The main group patients that had been treated with the described method did not have discomfort or pains. The nidus of the bone tissue and apical root parts vacuum has not been revealed in the parodontium tissues by the X-ray. The introduced method allows us to: effectively treat teeth that have been treated with the resorcin-formalin method earlier in a short time (about 15 days); obtain stable treating effect that allows as to recommend it for a wide stomatological practice.

**APICAL PERIODONTITIS TRETMENT
WITH APLICATION OF THE EXXUDATE
REMOVAL FROM THE TOOTH CHENNEL
TOOL ALONG WITH THE «GEPON»
PREPARATION IMUNNE CORRECTION**

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Apical periodontitis, its various forms, emergence of the chronic infection nidus within oral cavity, teeth loss, and, as a result, man's work capacity loss testify the currency of the search for effective treatment of this pathology. An ambiguity of the data on immune system condition under the inflammatory diseases allows us to study periodontitis as a display of the immune system disturbance that require immune correction.

Among modern preparations for this case «Gepon» occupies a deserving place. «Gepon» structure determines a number of new effects: «Gepon» is an immunomodulator and has a anti-virus impact: it causes the production of a- and b-interferons, mobilizes and activates macrophages, limits the production of the inflammation cytokines(interleukins 1, 6, 8, and the tumor necrosis factor), stimulates the antibodies production to various antigens of the infective nature, suppresses the viruses replication, increases the organism's resistance under the infection caused by viruses, bacterium, or mushrooms, neutrophil functional activity is increased as well as the one of CD8+ T-cells, that are the key links of the organisms defence against the bacterium, viruses, and mushrooms. «Gepon» can be combined with the anti-bacterium preparations, glucocorticosteroids, immunodepressive preparations, that allows us to use it in the periodontitis treatment.

It is commonly known, that the toxic products output from the sphacelous pulp into the periapical space lead to the inflammation of the latter (Sundqvist G., 1976). As the blood vessel are widened and the liquid is accumulated, a pressure in the periapical part can increase. The liquid accumulation often becomes intolerable and hard pain can reach the level where even strong narcotic analgesics wouldn't help if it is not relieved. However, the pulp remains removal can prove to be insufficient and in that case the only alternative way would be the direct access to the top through bone (N.M. Aleksandrova, 1998). This operation is rather traumatic and quite difficult in its technical implementation, so the search for a new treatment methodics, that allow us to avoid surgery is urgent.

The goal of this research is the increase in apical periodontitis treatment quality.

The objective of the research is to develop and testify the methodic of the implementation of

the tool that removes exudates from a tooth via permanent vacuum in combination with the immunomodulator «Gepon» application under apical periodontitis, that allow us to increase the treatment effectiveness, shorten it and avoid surgery.

Materials and methods. An inspection and treatment via permanent vacuum and «Gepon» preparation of 150 patients (85 men and 65 women in age of 25 to 55 years) with apical periodontitis was carried out by us. The vacuum was created with the exude removal tool. A group of patients (100 persons) with the same diagnosis that has been treated with the common method formed the control group.

The exudates removal tool that has been used in our work is an elastic tray, formed for the whole teeth line to which a full elastic container is fixed to create a permanent vacuum, that has intake and exhaust valves on its foundations, a flexible tube is fixed to the intake valve – it is the suction, the second end of which is introduced into the tooth root channel, and a container for exudate accumulation is formed on the suction tube's horizontal curve.

Research results. The application of the introduced tool along with the «Gepon» preparation was probed on 150 patients with apical periodontitis, 100 patients who have been treated with a Endo Sonic Air 300 formed the control group.

Within 54% of the control group patients who have been treated with Endo Sonic Air 3000 felt pain when biting in the purpose tooth area. A pain often occurred while eating, especially a solid food. Among the patients with parodontium diseases the pain was present even longer. Patients who had been treated with the introduces tool had no pain of any discomfort later. Only four patients had some discomfort while eating solid food within the first 2-3 days.

A weakly painful percussion was revealed among 6 of the control group patients (12%) within the control inspection 12 months later. Among 9 patients (18%) a periodontal fissure increase and the bone tissue exhaustion in apical root parts was registered on the X-ray film.

A clinical picture among the patients of the main group who was treated with the introduced method was much better at the control inspection a year later. Pain and discomfort were not registered. Bone tissue and apical root parts exhaustion inflammations were not revealed by X-ray facility.

It is known that chronic parodontium inflammation takes place at the background of significant alterations of local protective reactions of both specific and non-specific character. The components of specific and non-specific oral cavity immune protection act in a complex way, thus creating a number of immune responses. But with apical periodontitis a disfunction in the oral cavity anti-bacterium barrier emerges. A treatment with the introduced «Gepon» preparation provided for the decrease in the natural resistance factor tension and the reduc-

tion of the inflammation process, that testifies the elimination of the local immunobiological tension

The implementation of the introduced tool and «Gepon» preparation allows us to: effectively treat the main pathogenetic mechanisms of the periodontitis development in a short period (3-5 days); obtain a stable healing effect. Analysing the research results we can conclude that the tool for the exudates removal from a tooth with the implementation of the permanent vacuum is convenient to use, well endured by patients, do not have side effects and contradictory evidence to use. While applying the introduced tool the exudates is effectively removed not only from the channel and its numerous branching, but also from the periodontium tissue. The obtained data allows us to recommend the introduced facility in both its technical form and effective impact time.

It has been defined that complex apical periodontitis treatment with the implementation of the permanent vacuum and «Gepon» preparation, with the introduced facility is on principle new, pathogenetically-proved approach to the treatment of this pathology, it demonstrates an expressed therapeutic effect that allows us to recommend it for a wide stomatological practice.

NEW ASPECTS OF POSTOPERATIVE ADHESIOGENESIS IN A CASE OF HORMONAL INSUFFICIENCY

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Last years, the quantity of surgically treated gynaecological diseases, used to be progressively increased. The most frequent surgical intervention is hysterectomy. The rate of morphogenesis pelvic and peritoneal adhesions after hysterectomy is about 92,0–100%. For example, 92,6% – after supravaginal amputation of uterus, 95% – after uterine extirpation.

Postoperative adhesions has a great negative influence on a patients health condition, causes an intestinal obstruction, chronic pelvic pain syndrome, different surgical complications as an injuring of viscera and etc. Experimental and clinical research of adhesiogenesis in a case of surgical caused hormonal insufficiency was performed. In animal experiment the direct connection between Total Volume of Adhesions and operational injury was determined. So the widening of operational injury volume in a condition of attendant postoperative hormonal insufficiency activates the elevation of adhesiogenesis.

The main aim. Clinical assessment of adhesiogenesis level under condition of a surgically caused hormonal insufficiency.

Materials and methods. It was about 50 females after hysterectomy without adnexa (1 group)

or with adnexa (2 group) was examined on clinical phase of investigation. The age of patients was about 39-55 years. The main reason of surgical treatment was myoma or adenomyosis – in 94% of cases. In all cases the menstrual function before operation was remained. In both groups the comparative investigation, included laboratory test of fibrinogen concentration, FSH- and estradiol level (on 6-7 day after surgery), ultrasonic assessment of adhesiogenesis (on 30-45 day after surgery), questioning with a standart inventory form SF-36 was made. It was about 4 cases of repeated laparotomy or laparoscopy after earlier executed hysterectomies.

Results. 76,5% females had some complains after operation. The most frequent complains were hot flushes, heartbeat and hyperhidrosis. Pain and discomfort in a lower parts of abdomen were registered as complains in 30% at the 1 group and 65% at the 2 group. Estradiol concentration on the 6-7 day after operation was reduced at the both groups (from 67–250 pg/ml down to 39,8-163 pg/ml). But in contrast to the 1 group, the FSH concentration at the 2 group was considerably higher. The level of fibrinogen was normal in 65% at the 1 group and in 10% at the 2 group. Hyperfibrinogenemia at the first group was moderate (4-5 g/l). At the 2 group hyperfibrinogenemia was moderate only in 45%, and in 55% the fibrinogen level was higher than 5 g/l. Atypical location of ovaries or pathological formation or cervical stump was in 10% at the 1 group and in 25% at the 2 group. Unusual fixation, position and

contour changing, parietal or visceral adhesions were in 10% at the 1 group and in 30% at the 2 group. After repeated surgical treatment of patients with hysterectomy with adnexa in anamnesis adhesional process was determined: epiploic adhesions with front-lateral abdominal wall near scar, with the cervical stump, planar and friable adhesions with the top of bladder, sigmoid colon. Laparoscopy (because of tumors formed after hysterectomy without adnexa) was produced in 2 cases. Single avascular adhesions along lateral quadrants of abdominal cavity, friable adhesions with the poles of tumor with parietal peritoneum, intestinal loops and the top of bladder were determined.

Resume. Postoperative adhesiogenesis after hysterectomy correlates with estrogen insufficiency.

Clinical manifestation and adhesiogenesis intensity, including associated with the symptoms of surgical menopause, higher in a group of females after hysterectomy with adnexa, which allows to suppose the reasonable prescription of hormonotherapy in such a cases.

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AN IMPACT OF SYNTHESIS PROCESS PARAMETERS UPON THE STRUCTURE AND SIZE OF TITANIUM DIOXIDE PARTICLES

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By the means of thermo-gravimetry, electronic microscopy, and x-ray phase analysis has been studied the process of obtaining titanium dioxide of different morphology and phase composition. AN impact of pH hydrolysis, initial substances and SAS concentration, and pre-cursor incineration temperature influence upon particles size and obtained titanium dioxide structure has been investigated.

Keywords: titanium dioxide, synthesis, particles, anatase, rutile, surface-active substances

Non-organic chemistry on its current development stage plays as a fundamental basis for the creation of new generations of functional materials. Characteristics of hardphase multi-component materials in metastable condition are defined not only by their chemical composition, but also by their different levels' structure. A preparation of materials with a given characteristics complex present special requirements to the conditions of obtaining **intermediate products (pre-cursors)** with a definite chemical and phase composition and high homogeneity that must be secured on the synthesis stage and saved through all way to the final product [1, 2]. The importance of these requirements is affirmed while synthesizing oxide materials' pre-cursors that are in fact the basis of accurate ceramics. Their functional characteristics are defined by the presence of definite crystal and homogeneous structure in their composition.

For example, an implementation of nanostructures titanium dioxide in photo-catalytic water conversion will allow us, in future, to realize the process of hydrogen obtaining by a more economic method that, in its turn, will allow us to use hydrogen as an ecological material in the production of electric energy. Among the existing polymorphous forms titanium dioxide in its anatase modification shows the greatest activity in photo-stimulated catalytic and photo-electric reactions. The photo-activity strengthening is explained by a higher Fermi level of anatase (3,3–3,4 eV), compared to rutile (3,1–3,2 eV) [3].

To define a possibility to obtain titanium dioxide with a programmed characteristics complex a research, aimed for defining the correlation between main synthesis technology parameters (pH environment, reagents' concentration, SAS presence) and final product characteristics has been carried out.

Experimentant part

Hydrated titanium dioxide has been obtained via its deposition from titanium tetra-

chloride solutions. Water ammonia solution was used as an alkaline agent. The process realization was carried out on a continuous scheme and it secured the constant correlation of involved components within the process. In experiments solutions of $TiCl_4$ with a concentration of 0,046–0,13 mole per liter and water ammonium with a concentration of 0,186–0,541 mole per liter was used. Hydrolysis was carried out under constant indexes of pH_d that equal 1,0; 2,0; 3,0; 5,0; 7,0, and 9,0. Isopropanol and butanol were used in experiments with SAS. The definition of titanium oxy-hydrate synthesized samples' particles' size (titanium dioxide pre-cursors) was done on a laser particles analyser Microsizer-201 and on the scanning electric microscope S-3400N («Hitachi», Japan). Processes that take place under the warming of titanium oxy-hydrate were studied via method of synchronized thermal analysis on the facility «STA 449 C Jupiter» («Netzsch», Germany). The batch mass equaled 10-15 mg, and argon warming up to 1000°C speed in atmosphere was 10 degrees per minute. The control of phase substances composition was carried out on an x-ray diffractometer XRD 7000, (Shimadzu, Japan).

Results and discussions

Summarizing experiments we have discovered that within the process of chemical titanium oxy-hydrate deposition under $pH_d = 1$, its particles' size equals 30-50 nm, while the sample that was deposited under $pH_d = 9$ initial particles' size reaches 100-120 nm. Along with the increase in pH_{oc} , particles become more homogeneous according to their granulometric composition. An increase in reagents' concentration provides for the obtaining material with bigger particles. It is why pre-cursor synthesis process should be carried out with $pH_d < 3$ and using the most diluted initial solutions.

On the thermogram of titanium oxy-hydrate sample (Fig. 1) one endothermic and two exothermal effects are present: endoeffect is observed in within temperature interval

65–220 °C, it is accompanied by a decrease in sample mass by 55% and is related with the removal of water molecules from the deposition. An index of seemed energy of pre-cursors dehydration activation process (E_{av}), calculated via the methodic [4, 5] is located in the interval of 24,4–32,3 kJoule per mole and generally increases along with a decrease in pH_{oc} . Under warming up to 300–400 °C takes place a condensation of OH-groups, left in TiO_2 (mas

loss equals 2,5%) and the formation of anatase phase within the sample, its presence is defined by x-ray graphics. Warm that deposits under the substance crystallisation depends the general exothermic character of the undergoing processes.

The undertaken research shows that under the warming of samples take place the processes, that can be characterized by the following scheme:

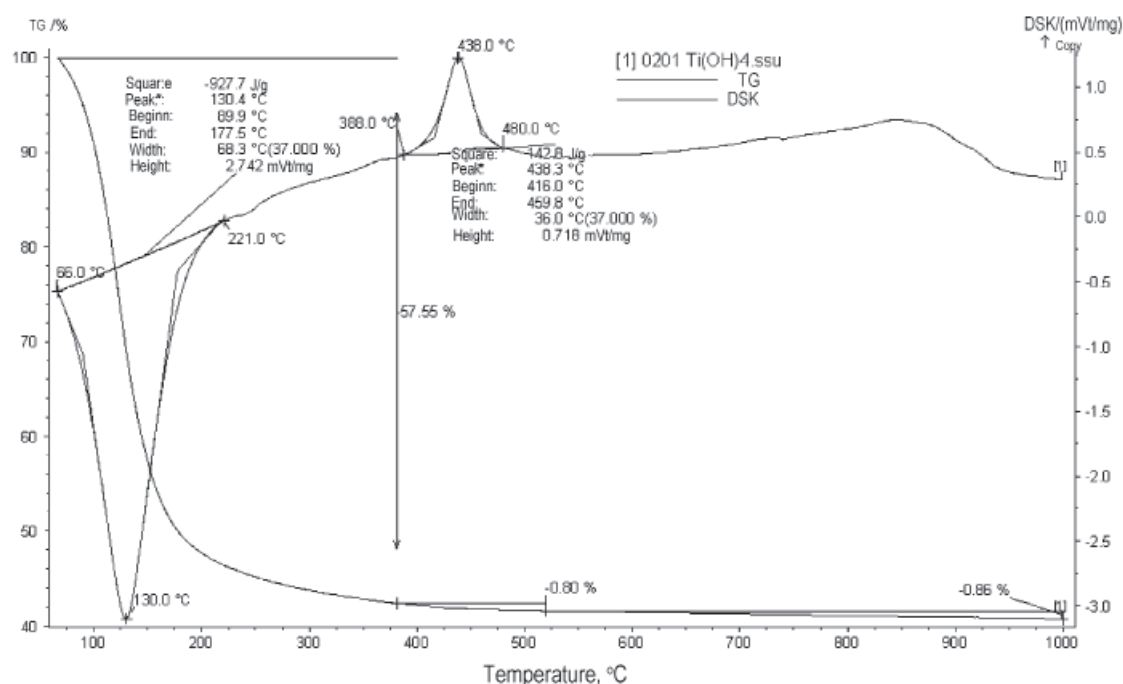
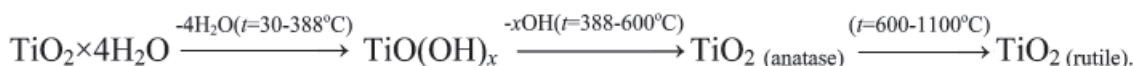


Fig. 1. Thermogram of titanium oxy-hydrate, obtained under $pH = 9$

From the example of titanium oxy-hydrate, synthesized under $pH = 9,0$, an impact of thermal processing conditions upon a phase composition of obtained material has been observed. It has been defined that under the process of thermal processing of the sample takes place a reconstruction of its crystal structure: under the warm up to 300–600 °C the anatase phase prevails in the material, and under its ignition up to 1100 °C the rutile titanium dioxide modification does.

Besides pH_{oc} , the hydrolysis process speed and, therefore, the formed deposition particles' construction and morphology can be affected by the alcohol additions that are present in the reaction solution, they show their surface-active characteristics [6–8]. In experiments iso-propile (IPA) and butile (BA) alcohol was

used as an organic addition. Such coise was determined by the presence of highly-reactive groups within them.

As shown by experiments (Fig. 3), the usage of SAS allows us to obtain titanium dioxide precursor with more homogenous in their structure particles, between which a division difference is observed. Obviously, this effect is explained by the particles' surface stabilisation and, therefore, their agglomeration ability decrease.

SAS presence in the deposition of titanium oxy-hydrate influences the process of phase formation under warming. It has been defined that SAS presence significantly slows down the transformation of obtained product from its amorphous structure into crystal, thus impacting the obtained titanium dioxide particles' size (Fig. 4, table).

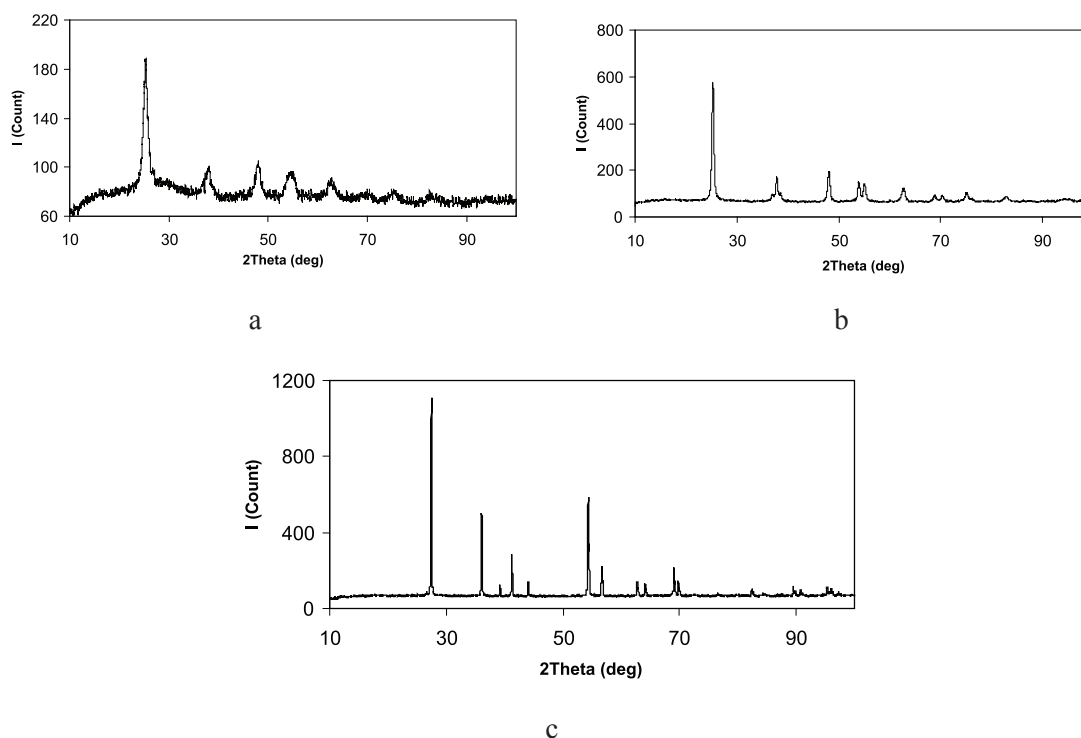


Fig. 2. X-ray picture of titanium dioxide samples, ignited under the temperature (°C): 300 (a), 600 (b), and 1100 (c)

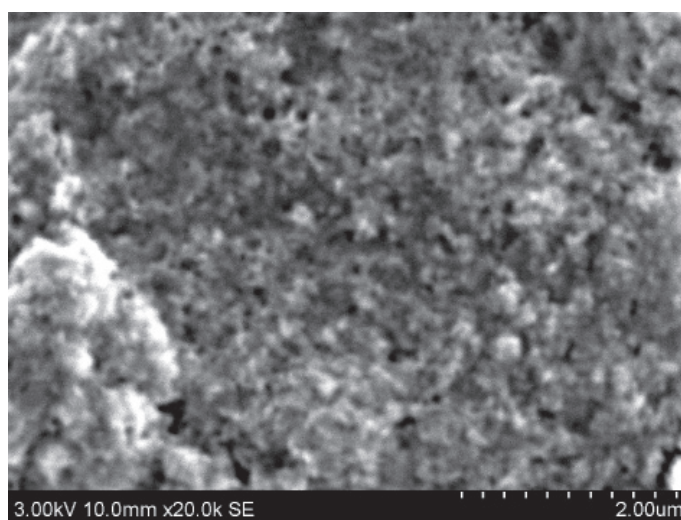


Fig. 3. SEM microphotography of titanium oxy-hydrate particles, obtained with an addition of 5% butile alcohol

The dependence of the average crystal grain size on the sample receipt conditions

Product receipt conditions	$t_{ig} = 300\text{ °C}$ with SAS addition	$t_{ig} = 300\text{ °C}$ without SAS addition	$t_{ig} = 600\text{ °C}$ with SAS addition	$t_{ig} = 600\text{ °C}$ without SAS addition	$t_{ig} = 1100\text{ °C}$ with SAS addition	$t_{ig} = 1100\text{ °C}$ without SAS addition
D_{av} , Nm	3,1	21,1	45,2	65,8	158,1	210,7

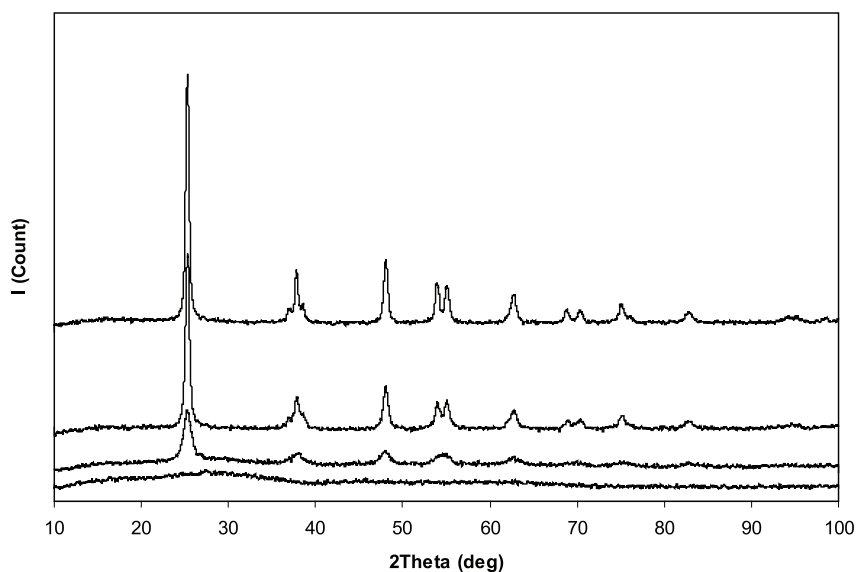


Fig. 4. X-ray diffractions of samples, obtained after the titanium oxy-hydrate ignition:
 1 – sample, obtained under the temperature 300°C with an addition of SAS, 2 – sample, obtained under the temperature of 300 °C without the addition, 3 – sample obtained under the temperature 600 °C with an addition of SAS, 4 – obtained under the temperature 600 °C without the addition

The correlation between titanium dioxide samples' synthesis conditions and the average size of formed crystal grain (D_{av}) that was calculated with the equation of Sherrer [9], is shown in the table below.

As shown by the table, titanium dioxide crystal enlargement takes place along with the raising of temperature. In the meantime the size of the powder particles that have been received with an addition of surface-active substance is significantly smaller, compared to its analogue that has been received without the addition.

Thus, the received experimental data and revealed dependences allow us to select the most satisfactory process realization conditions depending on what characteristics should the synthesized titanium dioxide possess. It gives us the ability to synthesize new materials with a controlled physico-chemical characteristics' complex.

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INVESTIGATION OF PROCESSES THAT TAKE PLACE UNDER THE WARMING OF TITANIUM DIOXIDE, RECEIVED VIA HYDROLYSIS OF VARIOUS TITANIUM ALCO-OXIDES

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Processes that take place under the warming of titanium dioxide pre-cursors, received via hydrolysis of various titanium alco-oxides have been studied. Temperature intervals have been investigated within which processes of dehydration, deposition, and crystallization take place, as well as a phase composition of products that form under pre-cursors thermal processing.

Keywords: titanium dioxide, anatase, rutile, titanium alco-oxides, pre-cursor, thermal processing, synchronized thermal analysis, X-ray phase analysis

One of the main objectives of modern non-organic chemistry is the development of new methods of substances' synthesis that provide the receipt of materials with a regulated exploitation characteristics' complex, first of all, with high frequency and fixed granulometric structure [1]. This problem arises particularly in the creation of new powder materials, production of which nowadays is one of the major goals of the world economy. Besides, especially high development progress can be observed in the production and implementation of non-metal powders, among which an important place is occupied by a highly toxic titanium dioxide [2]. It is used in the production of special ceramics, sensors, photo-catalysts, microwave technics, etc [3-5]. All works, aimed for the development of titanium dioxide receipt methods with stable exploitation characteristics are considered to be urgent nowadays [1].

Alco-oxide method is referred to the most perspective means of fine dust TiO_2 powders receipt. Its important advantage is the ability to achieve homogeneity of powders up to their molecular level. Alco-oxide method implies the undergoing of titanium alco-oxide hydroxylation reaction with a deposition of gel-pre-cursor – oxy-hydroxide of titanium that transforms into the titanium dioxide under its further thermal processing. The selection of pre-cursor thermal processing conditions defined the characteristics of the received TiO_2 powder, its granulometric and phase structure in particular.

The objective of this work is the investigation of processes that take place under the warming of **titanium dioxide pre-cursors (TD)**, received via hydrolysis of various titanium alco-oxides thermal processing and the definition of phase structure of products that form under products' thermal processing. To synthesize TD samples we have used alcohol solutions of titanium tetra-etoxyde (TD-1 sample),

titanium tetra-isopropoxyde (TD-2), titanium tetra-propoxyde (TD-3), tetra-butoxyde (TD-5). After deposition and washing, sediments were dried to a constant mass consecutively on air and in drying bottle over melting $CaCl_2$.

Thermal analysis was carried out on a facility STA 449C Jupiter (Netzsch, Germany) (joint hinge mass equaled 7-14 mg, argon atmosphere, warming up to 1000°C with speed 10 degrees per minute). The control of phase, morphological, and chemical composition of substances that formed on different pre-cursors' formation stages was carried out via methods of X-ray phase analysis (diffractometer XRD 7000, Shimadzu, Japan), electric microscopy, and X-ray spectre analysis (electronic microscope S-3400N with an attachment for PCA, Hitachi, Japan).

The analysis of received termogrammes (Fig. 1-5) shows that they contain endothermic effects that are accompanied by a decrease in substances' mass, and exothermic, that undergo without alterations in mass or with its little alterations. Endothermic effect is also linked to processes of water and alcohol remains removal from pre-cursors composition that teke place under the warming of materials up to 280-320°C. As X-ray phase analysis showed, materials that have been dried on air under indoor temperature, as well as those that have been ignited under the temperature that doesn't exceed 320°C, stay in X-ray amorphous condition and doesn't reflect on the X-ray picture. Under further TiO_2 pre-cursors warming, in interval of 350-600°C, takes place the process of anatase phase and X-ray amorphous TiO_2 that is reflected in thermogrammes by the exothermic effect, and in X-ray pictures – by a strengthening of anatase line intensity. The ignition of samples under the temperature higher than 650°C leads to the formation of rutile phase and the decrease in anatase phase in their structure.

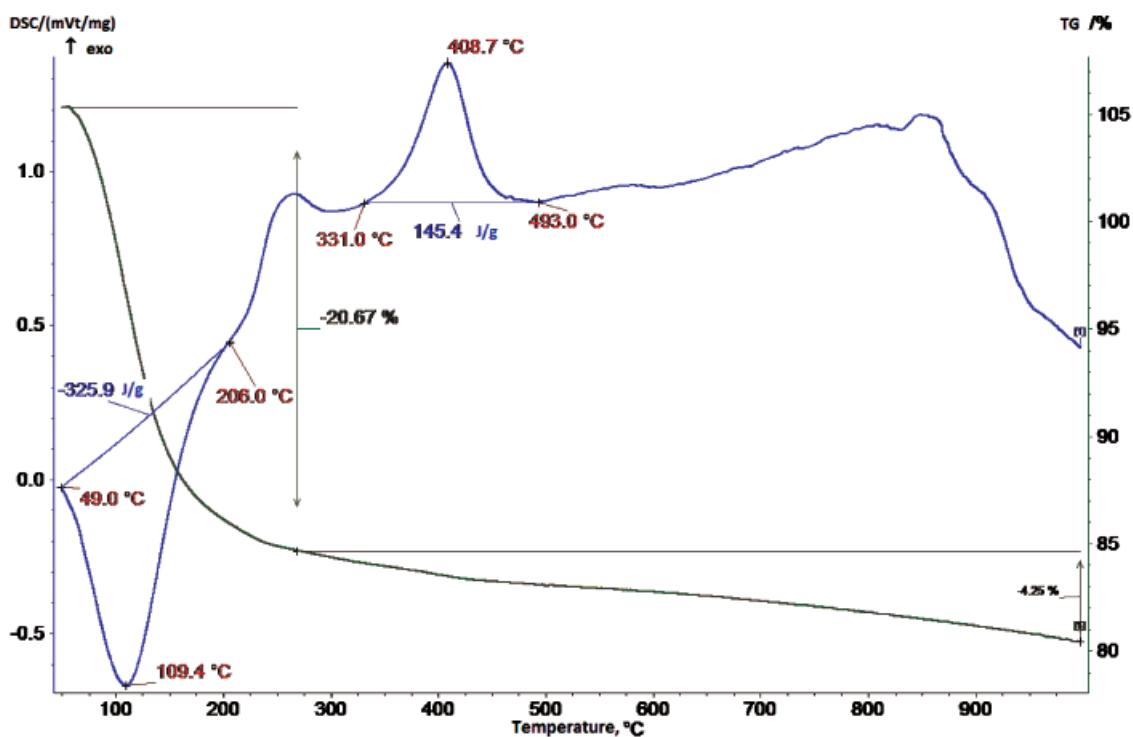


Fig. 1. TD-1 pre-cursor thermogram

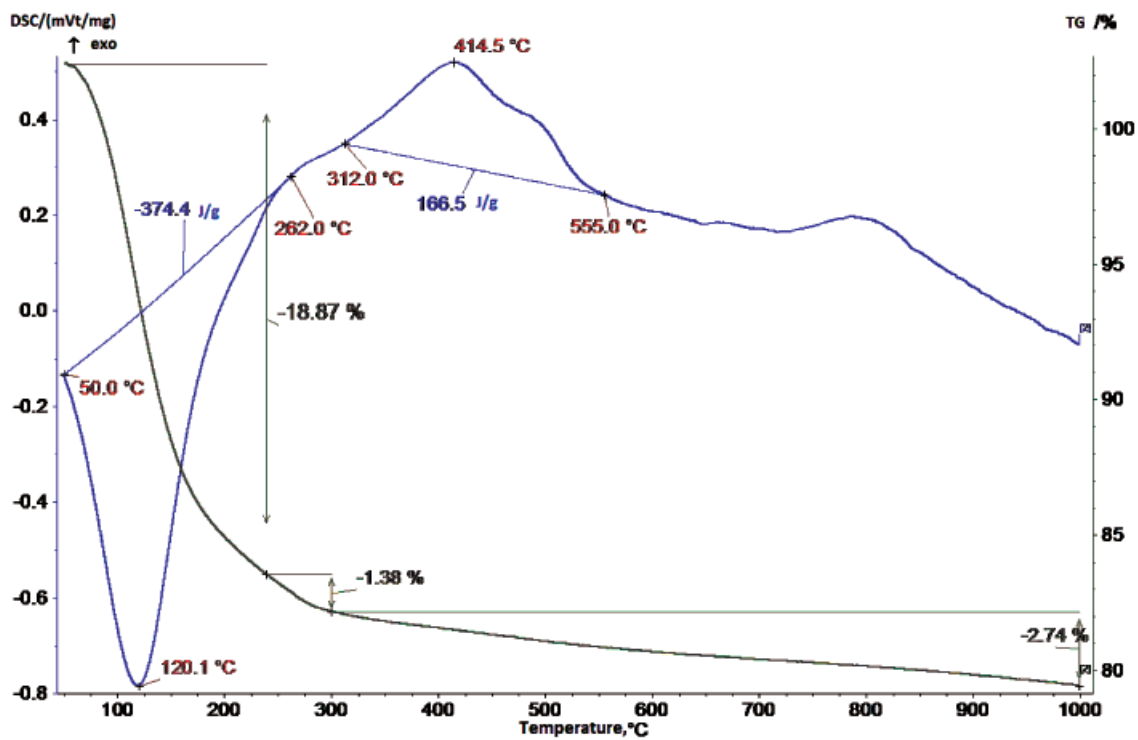


Fig. 2. TD-2 pre-cursor thermogram

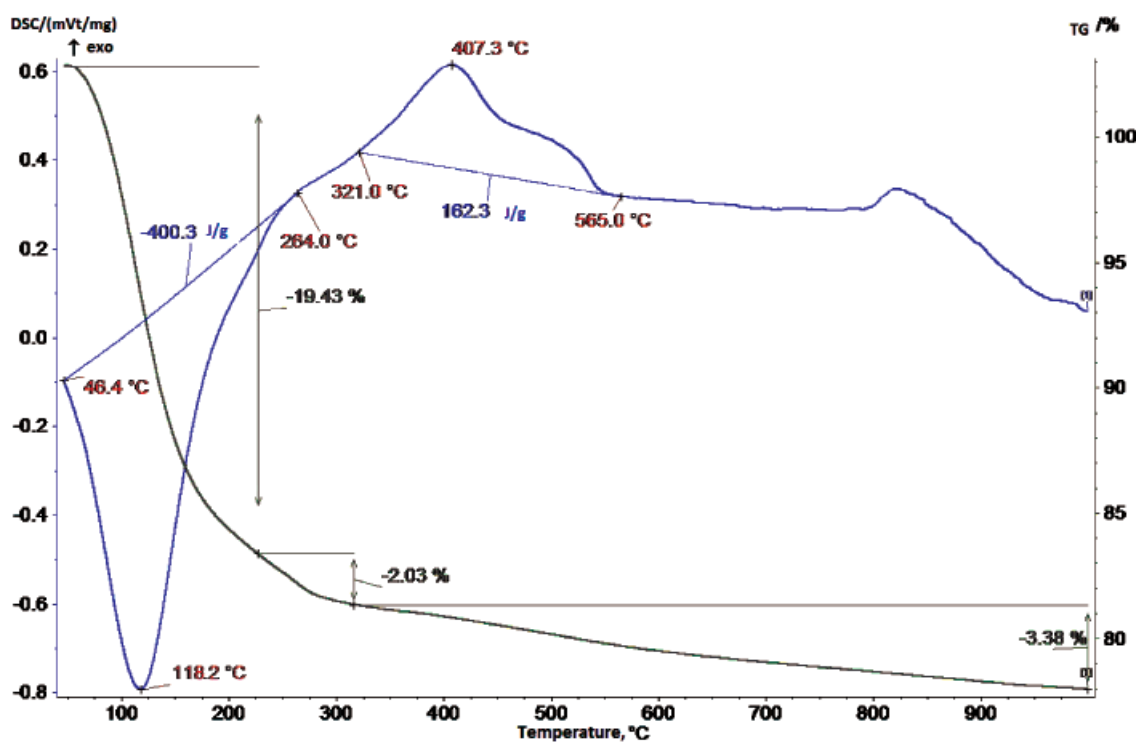


Fig. 3. TD-3 pre-cursor thermogram

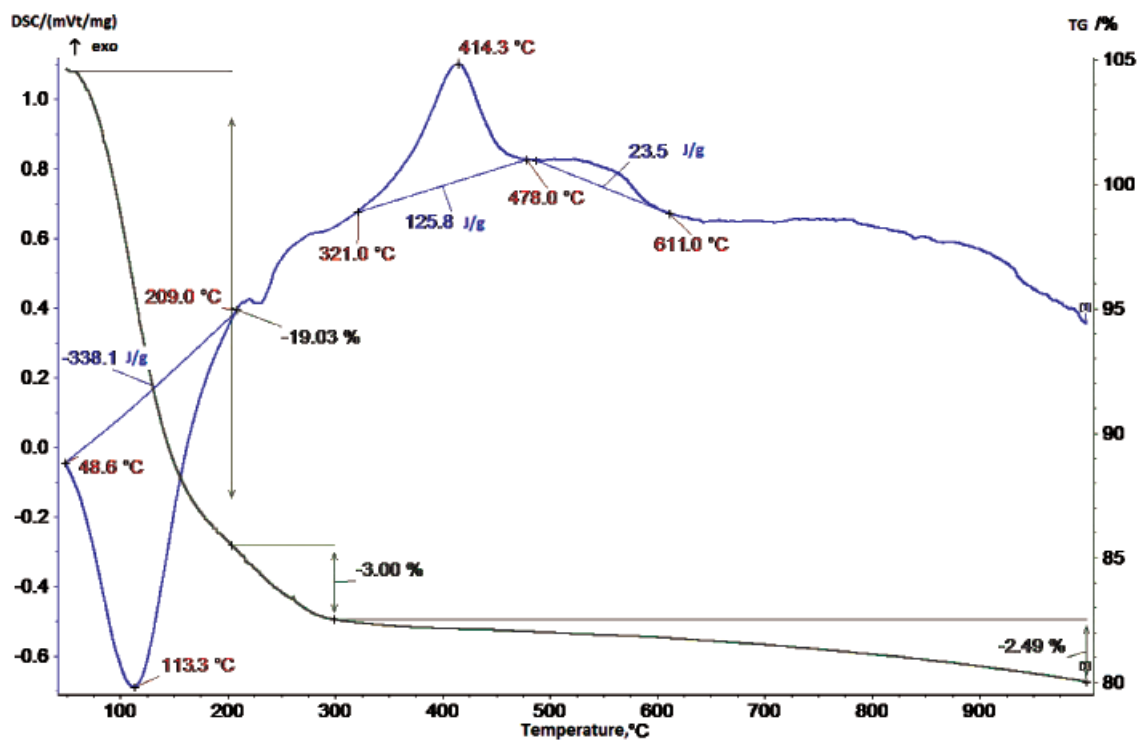


Fig. 4. TD-4 pre-cursor thermogram

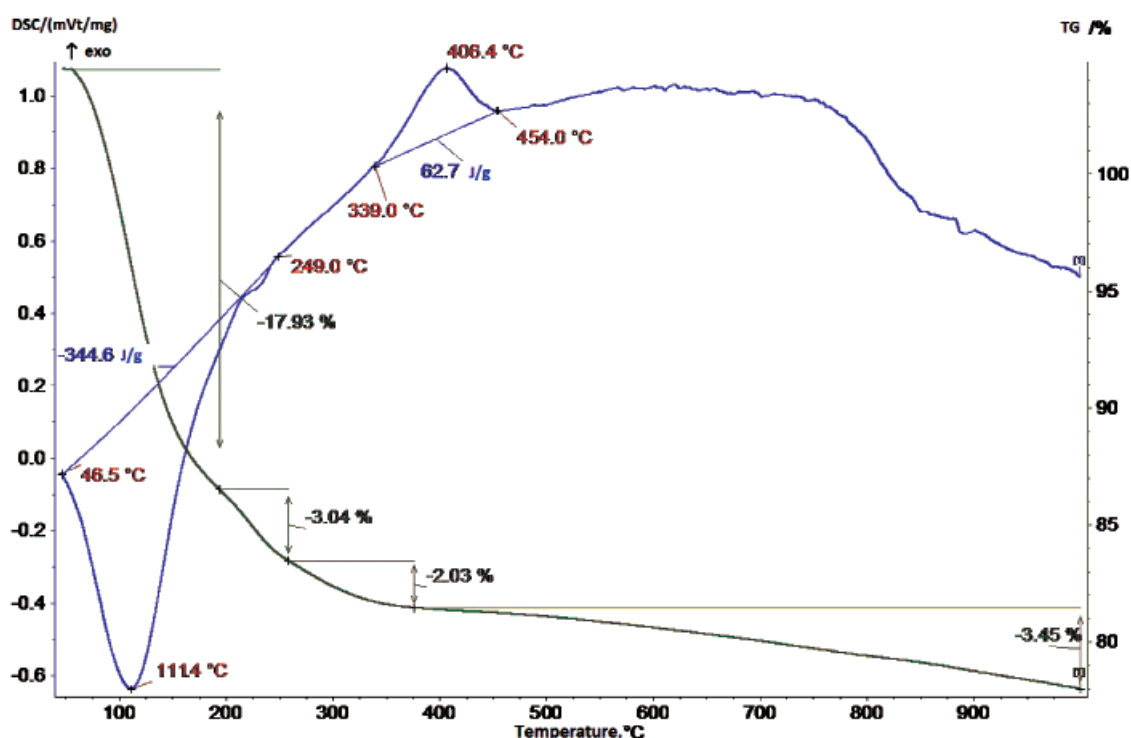


Fig. 5. TD-5 pre-cursor thermogram

In materials, ignited up to 900 °C rutile phase is exposed by X-ray picture (TD-2, TD-4, and TD-5) or a mixture of rutile and anatase phase (TD-1 and TD-3). The highest main rutile peak intensity and, therefore, the highest content of this phase has the sample TD-4. In samples TD-1, TD-2, and TD-5 rutile content is approximately equal.

In all samples that have been ignited up to temperature higher than 900 °C X-ray picture exposes only the rutile phase. The structure formation process undergo under the warming of TiO₂ pre-cursor is illustrated in the table, on the example of TD-4 sample.

An impact of TD-4 sample ignition temperature upon the intensity of line $I/I_0 = 100\%$ on the X-ray picture

Warming temperature, °C	Phase composition	Line intensity, imp.
20	X-ray amorphous	103
400	Anatase	278
600	Anatase	648
920	Rutile	1150

The comparison of the beginning, extremum (peak), and ending temperature of dehydration and anatase crystallization processes on thermogrammes of pre-cursors' samples shows that temperature of titanium alco-oxide that is used for a pre-cursor receipt, weakly influence these parameters: the difference does not exceed 10-15 °C.

Heat effects (ΔH) of these processes within TiO₂ pre-cursors also faintly depend on a chemical nature of titanium alco-oxide that has been used for their synthesis. Though some decrease in dehydration process ΔH is observed in the line TD1 > TD2 > TD3 > TD4 > TD5 from 49 to 37 Joule per mole of TiO₂, it might testify a weakening of molecules' connection to substances' structure. ΔH of anatase crystallization in the described line grows from -16 to -7 kJoule per mole of TiO₂.

From Fig. 1-5 it is seen that anatase crystallization in X-ray amorphous samples of TD-1, TD-4, and TD-5 undergoes in one stage, while for samples TD-2 and TD-3 it takes two stages. It can be linked to the received pre-cursors' samples' size and agglomeration degree.

As shown by SEM microphotographies, initial particles' size of all pre-cursors' samples that have been dried under indoor temperature equals 60-120 nm (Fig. 6). Samples of TiO₂

pre-cursors TD-4 and TD-5 have the smallest particles' size, in average 88 and 60 nm correspondingly, they are grown to each other into agglomerates and are close to sphere shape. In samples TD-1, TD-2, and TD-3 particles are more agglomerated. Obviously, agglomeration

of samples' particles complicates the undergoing of anatase crystallization process from X-ray amorphous dioxide. This statement is also testified by the widening of the corresponding peaks that is observed in the thermogrammes of these samples.

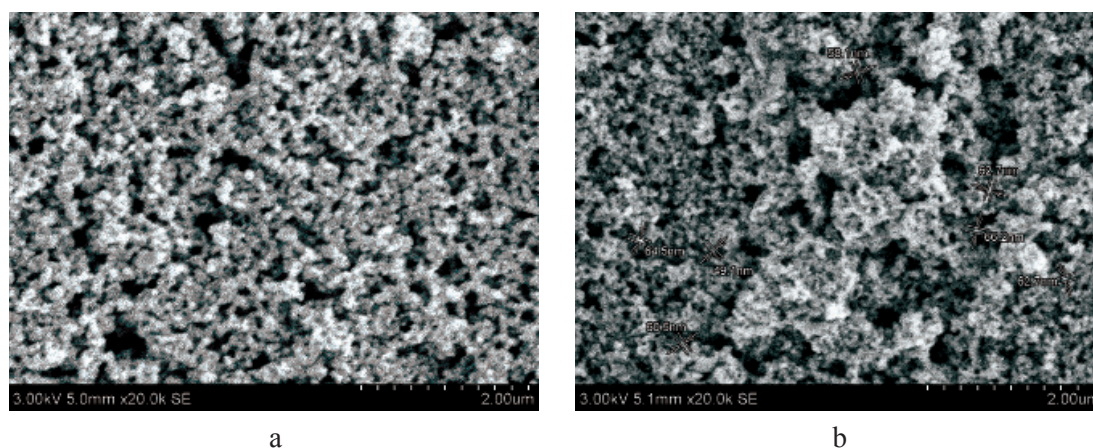


Fig. 6. SEM microphotographies of titanium dioxide pre-cursors TD-1(a) and TD-5(b)

According to the results of this research, we can conclude:

1. Under the warming of pre-cursors two kinds of processes take place: substances' dehydration (with a removal of alcohol remains) and their crystallization. Because of eolation-oxeolation processes takes place an ordination of pre-cursors' structure that is accompanied by the substance transformation from X-ray amorphous into crystal condition – consequently to anatase and rutile modification of titanium dioxide. Close indexes of dehydration ad crystallization processes' heat effects of TiO_2 pre-cursors that were received from various titanium alco-oxides testify a weak impact of the initial substances' chemical nature upon the formation of materials' crystal structure.

2. Depending on pre-cursors' thermal processing conditions, final product (titanium dioxide powder) can be received either with disordered crystal structure (pre-cursor ignition under a temperature lower than $300^\circ C$), or with an anatase structure pre-cursor ignition under a temperature lower than $350-650^\circ C$), or with a rutile structure pre-cursor ignition under a temperature higher than $900^\circ C$).

3. Chemical nature of titanium dioxide dependent pre-cursors' morphological characteristics: the smallest particles and the lowest agglomeration are present in titanium dioxides, received from titanium tetra-butoxide and tetra-tretbutoxide. Considering the value and availability, titanium tetra-butoxide is recommended for use as an initial material.

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*Materials of Conferences***RESEARCH OF DIMERIC COMPLEXES OF PLATINUM(II) WITH AMINOACIDS**

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After Rosenberg discovered cytostatic activity $\text{cys-}[\text{Pt}(\text{NH}_3)_2\text{Cl}_2]$ (cys-DDP) in 1965, a great interest to complex platinum and palladium compositions arose. Up to day, cys-DDP is one of antitumoral preparations that are used in medicine. However, a number of disadvantages of it, one of which is the medicine's high toxicity. Stimulates the search for new less toxic and more effective preparations based on platinum(II) and palladium(II) complexes. It seems perspective to use platinum and palladium complexes in combination with biological ligands, natural solutions that are present in human organism and involved in metabolism. An example of such ligands are amino-acids, components of

protein molecules. Because of the presence of two donor groups within an amino-acid, there is a possibility to synthesize dimeric platinum complexes, where bioligand will connect two central platinum atoms and be the bridge to connect them.

We have studied an interaction of cys-diamminodivaleptinoplatinum (II) with cys-diamminodivaleptinoplatinum(II) in order to obtain cys-tetraamminodivaleptinodivaleptinoplatinum (II). This complex was synthesized and studied by us via methods of element analysis, cryoscopy, conductometry, IR- and UV-stereoscopy, and NMR. It has been found that an amino-acid that is linked to two platinum atoms via aminogroup nitrogen atom and ionized carboxile group oxygen atom is the bridge to connect them.

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CENTRE AND SOUTH OF RUSSIA IN THE SECOND PART OF 1960-IES AND THE FIRST PART OF 1980-IES: ECONOMIC MODERNIZATION OR IDEOLOGICAL INTERACTION?

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In this article a problem of the Soviet state development history in the second half of 1960-ies and the first half of 1980-ies is investigated. Up to modern day it has been considered that within this period of «stagnation» exclusively conservation of both social-political and economic areas took place. However, under a closer look it becomes obvious that there were alterations in the country and they were linked to an activation in regional social initiative. Economic development was a component of state ideology and represented as a necessary control instrument for authority over regional society and was aimed to preserve territorial unity. Along with it, the development of economic modernization and ideological impact of the centre upon regions went along an ascending swipe – a command from the centre activated regional society that, in its turn, forced the centre to correct state ideology and alter the economy.

Keywords: economic modernization, ideological interaction, Centre and South of Russia

A gap between the expectations of the centre and regional realities mainly reflected in the realization of the national initiative thesis development within a new economic system.

In the second half of 1960-ies along with actively used forms (socialistic competition, handing of passing red banners) the centre provided for the creation of new social initiatives in regions – «marches of the thrifty», campaigns like «workflow without falling behind», etc.

The idea that campaigns, aimed for struggling in efforts to fulfill a state plan in the economic system were considered by both centre and regions as a necessary component of the state ideology is proved by the fact that their realization in regions was under responsibility of party structures [11, P. 29]. For example, the XVI Rostov regional party conference reported to the centre that according to the results of July (1970) Plenum of Soviet Union Communist Party Central Committee arose problems in all areas of economic construction – production of milk, meat, eggs, construction in the area of improving the culture of fodder lands farming, etc [11, P. 150].

The state actively used information on mass regional assistance in economic development in purposes of ideological influence. For the Southern region in the second half of 1960-1970-ies it focused on livestock sector, poultry keeping, coal sector, and was aimed for an assistance in constructing and mechanizing large enterprises [11, P. 153]. In the beginning of 1980-ies the centre considered the modernization of regional economies from the position of conscious work discipline, it was studied, in particular, by Y. Andropov [7, P. 53].

No less important was to spread the information of those favourable results that were achieved with a central aid in regions. Particularly, the «Agitator Notebook» reported in 1971 that in result of the introduction of coal combines the level of mechanized coal loading

grew up to 73,5%. Mining crews-millionaires of the enterprise «Rostov-coal» of M.P. Chikh and R.G. Muftakhov on the mine «Southern №2» prospected 8 million 950 thousand tons of coal» [11, P. 71]. In 1983 Y. Andropov in his interview for the newspaper «Pravda» speaking of the necessity of labour discipline, provided some positive examples from the social life of the Southern region – statefarm «Pridonskiy» of October (village) region... in 1982... for each cow milked over 3500 kg, thus decreasing its cost [7, P. 53].

Regional and territorial party institutions in their turn, strictly within the limits of covertly accepted protocols, reported to the centre that «... in 1968 52,1% of regional industrial enterprises worked according to the new system of planning and economic stimulating, and in 1970 such enterprises formed 92%» [11, P. 61]. This tradition persisted in the beginning of 1980-ies. It is known that by 1983 city and district party committees actively reported to regional committees on development and realization socialistic competition ideological provision under various slogans: «Work without falling behind», «Build on time – develop ahead of time»... According to official data, more than 500 thousand people participated in such initiatives in Rostov-on-Don [7, P. 7-8].

In this case the publication of data on regional social initiative activation that supported state orders was necessary. The same «Agitator Notebook» reported that Rostov region accepted an obligation to sell 525 thousand tons of grain over plan to the state [11, P. 158]. Besides 483 thousands of workers, engineering-technical employees and specialists took part in the «March of the thrifty». As a result, the state funds economy from the introduction of concepts in 1969 equaled 95,8 million rubles. In five years were saved: 35518 tons of ferrous metal, 76 million kV per hour of

electric energy, 498,6 thousands of conditional fuel, etc. [11, P. 67].

And, finally, it was a necessary term to demonstrate to regional society that the best and the most consecutive members of the society will be encouraged. Traditionally winners of social competitions were awarded in the studied period with honorable letters, passing red banners, material labour stimulation wasn't encouraged [12, R. 2890, L. 37].

To strengthen ideological translation downwards, into working groups, traditionally successes were translated into mass media means. Thus, in the report of the Rostov regional committee of Soviet Union Communist Party for 1976 that was published in the regional newspaper «Hammer», it was pointed out that, regardless of weather conditions, in the ninth five years positive results were achieved... Collective and state farms sold to the state 13,9 million tons of grain that is 2 million tons more than in years of the eighth five years [6].

Traditional forms of the regional response for a central initiative were various «appeals from innovators». With various applications made statements miners and farmers, pig tenders and mechanization experts. Even in the beginning of 1960-ies such type of social activity was mostly required by the centre in order to prove the ideology efficiency upon mass social consciousness. Usually information from sites on this problem was accompanied by statements about «inexhaustible initiative, aimed for the quickest accomplishment of objectives» that were set by one or another congress or described in a resolution [12, R. 2920, L. 27].

The most expressed example can be considered consecutive events that took place in relation with an accomplishment of a protocol decision of the Ministry Council Presidium of the 30th of January 1979 (protocol №5) «On the appeal from production innovators of Rostov, Krasnodar, and Stavropol region that was published in the newspaper «Soviet Russia» of the 18th of January 1979».

In their application innovators of the South of Russia expressed the idea to start a socialistic competition for an accomplishment of 1979' objectives and five years on the whole on each technical economic indicator «in all sectors of national economy, within each work group, on each workplace». In the appeal in was outlined that to achieve this goal only records of pacemakers are insufficient – «a pacemaker's limit today must become the standard for everyone tomorrow» [2]. A particular interest for understanding the regional community position in this case draws an appealing reprise that «workers who work... as it has always been... considered their duty to contribute as

much as they can into the solution of common problems» [3, L. 134].

Detailed data on state and regional mechanisms of this social initiative realization is contained in the foundation A-259. Ministry Council of RSFSR. A special meaning in the analysis have the original reports of regional national deputy' councils on the decision accomplishment in each region and also detailed statistic data on the majority of Southern Russia regions [3].

In the process of activation of ideological impact took part all corresponding central bodies – various ministries, agencies, party structures in whose competence it was meant to influence regional social consciousness.

In particular, the foundation A-259 contains data, according to which in order to fulfill the protocol decision of the Ministry Council Presidium of the 30th of January 1979, Ministry of industry on the 9th of February 1979 sent a letter №17-537 to the main production administrations, dependent industrial and production unions on the production of coal and peat, constructing trusts, ministries of fuel industry of autonomy republics, the administration of autonomy republics Ministry Councils on fuel industry, regional executive committees. With this letter, signed by the chief executive of fuel industry group V. Smuriakov, Ministry of fuel industry RSFSR obliged leaders of enterprises and organizations to discuss the described application together with social organizations in all labour groups, provide for an active participation of each worker for a common increase in production efficiency and work quality, non-accepting facts of lack of organization, squandering, non-accomplishment of plans, for an achievement of high final production results and fulfillment of accepted socialistic obligations. The Ministry organized socialistic competition between work groups on enterprises, construction sites for a preterm plan fulfillment and production effectiveness increase objectives [3, L. 7].

An active part in the studied process took the state committee of RSFSR on the material-technical provision (State Provision Committee) that outlined that labour groups of enterprises and organizations of RSFRS State Provision Committee while fulfilling the decisions of the XXII congress of Soviet Union Communist Party, November (1978) Plenum of Soviet Union Communist Party Central Committee, conclusions and arrangements, contained in the speech of L.I. Brezhnev at the Plenum, «involved into the socialistic competition for a successful fulfillment of the tenth five years goals» [3, L. 8]. RSFSR State Provision Committee by a circular letter of 13.02.1979 № 27/22-C also informed the dependent enter-

prises and organizations of the appeal by the production innovators of Rostov, Krasnodar, and Stavropol region. State Provision Committee reported to the Ministry Council that the corresponding message is already sent to regions its active realization is underway. In the letter, signed by K.A. Boldinov it has been underlined that organization and politic-training work takes place within work groups on workers' involvement into active fight for the best work results, resources' and time economy, productivity increase, and successful fulfillment of socialistic obligations. More than 20 thousand people or 87,7% of system organizations' and enterprises' workers actively participate in the socialistic competition. In the movement for a communistic attitude to work take part more than 40% of workers and employees [3, L. 8-9].

In the development of the discussed aspect also took part RSFSR State Committee of production-technical agriculture provision and Republic committee of RSFSR agriculture trade unions that, in their turn, sent the corresponding letter of the 33th of February 1979 №1/17 to sites. In it organizations obliged leaders of unions, enterprises to «actively discuss the appeal of innovators..., provide an active participation of each worker» together with social organizations [3, L. 23].

In order to secure the fulfillment of plan objectives by all enterprises and organizations the board of RSFSR State Agricultural Technics in May 1979 also discussed the problem of the Rostov regional agricultural technics work experience and initiated a corresponding order of the 14th of June 1979 №442 «On a wide spread of Rostov region agricultural technics work experience on the fulfillment of plan obligations by all unions, enterprises, and organizations» [3, L. 23].

Reports of the fulfilled obligations from sites appeared in the Ministry Council 6 months later – in January. Executive committee of Krasnodar region national deputies sent data to the Ministry Council of the 30th of January 1979 in which reported that Krasnodar regional national deputy councils had carried out a definite work on the deployment of socialistic competition for the fulfillment of objectives of 1979 and the five years on the whole in all technical and economic indicators and all national economy sectors, «in each workgroup, on each workplace» [3, L.25]. Region councils together with social organizations have «widely discussed» innovators' appeals in within labour groups of enterprises, organizations, collective and state farms. Here a special attention was paid to the development of the movement «Work without falling behind» and to an accept of individual socialistic obligations. According to the data by the Executive

committee, while in 1976 socialistic competition took part 320 workgroups and pacemakers who processed 78 thousand hectares of soil, in 1978 they turned into more than 5 thousand and the area increased up to 521 thousand hectares [3, L. 25]. In accordance with the accepted traditions the politic centre also received a report from the Council of Stavropol national deputies. It said that in the region the socialistic competition had deployed «even wider», more than 900 thousand people took part in it. Of them, 13 thousand pacemakers had already fulfilled their four-year objectives, and 1500 – the whole five years [3, L. 61]. Little different from these reports' data was the information from the Ministry Council of Kabardino-Balkarskaya ASSR in which, regardless of the statements of a wide republic support of Rostov, Krasnodar, and Stavropol region experience, negative facts were registered – «not all reserves and possibilities» had been used to fulfill plans and socialistic obligations. Moreover, Ministry Council of Kabardino-Balkarskaya republic confessed that six-months plan of the current year was not fulfilled by two enterprises in realization that equaled 1,7% of their total number, and by a number of enterprises in labour efficiency [3, L. 83-85].

By the first half of 1980-ies the centre more and more encourages the activation of regulated initiative in regions, allocating new aspects of state ideology in it. The resolution of the Central Soviet Union Communist Party Committee Plenum of the 15th of June 1983 suggested to broaden the practice of workers' participation in preliminary discussions of project solutions in different aspects of state and social life, thus officially claiming the strengthening of the society's independence, its promotion in the role of state control [1, P. 131].

In 1960-ies reports, the telegrams from workers on the central objectives' accomplishment, were traditional. Here examples of Rostov and Stavropol region are demonstrative. In 1962 Rostov worker were among first to report the achievement of the boundaries, set by CC plenums and the preliminary fulfillment of the year plan [13, R.3, L.85.] Group from the Lenin state farm of the village Gorkaya Balka in Stavropol in its telegram reported a preliminary fulfillment of the pre-congress (XXIV congress of the Soviet Union Communist Party) obligations [10].

In a number of cases representatives of the politic centre took an active part in the discussion of problems that were described by the regional society. Facts of dialogue were widely reproduced and discussed within groups and at party meetings. They were a part of ideological impact, an indicator of the existence of democratic trends in the soviet state. Such

method was actively used from the second half of 1970-ies, as it was also a way to preserve the control over society that started to weaken.

Particularly, L.I. Brezhnev systematically sent congratulation telegrams to workers into regions «to mark the occasion» – accomplishment of bread sales to the state plan [5, P. 362], fulfillment of grain sales obligations [9], all-Union meeting of productive workgroups [8], etc. One of the main dialogue elements was the «hot response» from workers to the general secretary of Soviet Union Communist Party Central Committee [5, P. 376-377].

Nevertheless, facts of obligations' non-fulfillment in Southern region were numerous. All of them were caused mainly by excessively high plans that were set by the centre and also by heavy obligations that workgroups had to accept under the influence from above.

Rostov regional committee of Soviet Union Communist Party reported to the centre that a number of mines of the same enterprise «Rostov coal» had not fulfilled their obligations of the socialistic competition by more than 29% [12, R. 2890, L. 38]. At the all-Union conference on problems Soviet Union Communist Party secretary L.F. Ilyichev, operating with facts that were provided by Southern region party organizations, outlined that «far not each collective farm had become a true «school of communism», as facts were known about «market sales for speculative prices of not only farm products, but also a collective farmers' assets» [4, p. 82].

State had to «zero» its requirements from the society in several cases in order to preserve the traditional order of the economic modernization management. One of the most famous measures is the write-off of collective farms' debts in 1965 after the Resolution of Soviet Union Communist Party Central Committee Bureau in RSFSR and the Ministry Council of RSFSR №641 of the 21st of May 1965 «On financial aid to collective farms». Rostov regional committee of the Soviet Union Communist Party on the 27th of July 1965 cancelled the debt of the collective farms of the long-term loans from the State bank that was discharged for capital investments in sum of 300 thousand rubles [13, R. 87, L. 26].

Thus, economic modernization on the second part of 1960-ies and the beginning of 980-ies was a component of the state ideology and was used more as a necessary instrument to strengthen the party's control over the regional society and to preserve territorial unity.

In ideological impact upon regions ideological, not economic structures of the centre played the leading role. Regional party bodies served as translators of ideas to citizens. The main trend was to impose forms and methods of economic modernization to regional society on sites.

In the studied period initiative of regional society also frequently was a result of an active impact from central organs. In major in developed in a number of ways. First of all, as a form decisions realization that were accepted on plenums and conferences of central state and party authority bodies, or supreme documents – Soviet Union Communist Party programmes, USSR constitution, etc. Secondly, regions' activity developed within the limits of creation and activity of social initiative measures. Thirdly, in the direction of economic interaction and realization of economy development plans, set by the centre within a region and the country on the whole.

A gap between ideological settings from above and local social-economic realities that became bigger, led to a decrease in regions' interest to orders from the central authority. State could not ignore it so it had to correct its course of economic policy and ideological settings on the whole.

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EUROPEAN HIGHER EDUCATION AREA: RUSSIA ON THE INTERNATIONAL MARKET OF EDUCATIONAL SERVICES

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International cooperation in the area of education is one of the key directions of Russian education and science Ministry and the most important tool in the process of integration of Russian science into the world educational and scientific-technological area. The paramount attention at the actual stage is paid to the development of mutually-profitable contacts within European space and, first of all, with the European Union. The work is carried out in order to improve the mechanisms and structure of interaction between Russia and European Union, to coordinate Russian and European scientific-technological and innovative priorities in the education area. The development of permanent education is a State political programme that is carried out with an active support by the society and aimed not only for the acceleration, but also deepening of the reformations.

Keywords: higher education, Europe, Russia, educational services

A multi-level cooperation takes one of the most significant priorities in the scheme of international connections that defines the growth of integration relations that include all areas of social relations, including education, science, technology, and innovations. The main goal of international cooperation is to increase the quality of Russian educational and scientific-technical potential, its competitiveness on the world market of scientific and educational services, and as a result, the provision of the quickest and the most effective transfer of Russian economy to an innovative development way.

Considering geopolitical and economic interests of Russia, its efforts in the area of international activity are aimed for the fixation of the results, achieved in recent years, and, on this basis, provision of further development in the area of cooperation with foreign countries and organizations within the most prior directions of education. A cooperation with European Union, its versatile institutions and programs is being developed (the 6th Frame programme of the scientific-technological EU development, TESIS, EURICA, etc), as well as with the European Council, Organisation of economic cooperation and development (OECD), a number of the UN system organizations (UN ECE, UNESCO, specialized scientific and educational organizations (Science committee of NATO, etc)). An active work is carried out on the line of «Big Eight» structures and regional economic consolidations (APEC, ASEAN, BSEC).

Russia is an active participant in many international agreements in the area of higher education. Among them we can outline:

- ❖ The convention of fighting discrimination in the educative area (14.12.1960, Paris, UNESCO);

- ❖ The convention of acknowledgement of educational courses, higher education diplomas, and scientific degrees in the European region states (21.12.1979, Paris, UNESCO);

- ❖ The European convention of equivalence of diplomas that give access to universities (11.12.1953, Paris) and its protocol (03.06.1964, Strasburg). In force in Russia since 17.10.1999;

- ❖ The European convention of university education duration period equivalence (15.12.1956, Paris). In force in Russia since 17.09.1999;

- ❖ The European convention of the general university education duration period (06.11.1990, Rome), in force in Russia since 01.01.1997;

- ❖ The convention of the acknowledgement of qualifications, linked to the European region education (11.04.1997, Lisbon). In force in Russia since 01.07.2000;

- ❖ The European convention of the academic acknowledgement of university qualifications (14.12.1959, Paris). In force in Russia since 18.10.1999.

Once again, we should underline, that one of the main directions of an international interaction is the establishment of two-side relations. Such relations are realized, first of all, with highly-developed countries, new industrial states, and also a number of the developing countries in Asia and Latin America. The Russian Federation signed a big number of interstate and intergovernmental agreements with different countries on questions of education, including higher.

The realization of such approach must lead to the achievement of new quality for Russian education that is defined first of all, by its correspondence to actual and perspective objectives of social-economic development of the country. The development of permanent education requires deep integration of all of the education system elements, and also their interaction with other social systems and reformations.

International cooperation in the area of permanent education must realize the following objectives:

❖ Coordinate education programmes in the area of the permanent education (adults' education);

❖ Provide the realization of joint projects in the methodology of adults' education in the direction of interactive educative methods wide introduction;

❖ Develop a programme on publication of text and methodological adults' education materials in Russia;

❖ Develop a programme on advancement of Russian training and methodological materials in the area of permanent education (adults' education) in the world market, and, first of all, CID market.

An importance of international educational cooperation in the area of development and strengthening stable, peaceful, and democratic societies is one of the social nature and accepted as the most prior one. In the Sorbonne declaration of the 25th of May 1998 the important role of universities in the development of European cultural values is outlined. The declaration explains the creation of European higher education zone as a key point in developing citizens' mobility with a possibility of their employment. European higher education institutions follow the fundamental principles that were formulated by the university charter «Magna Charta Universitatum» that was accepted in Bologna in 1998, and play the major role in the formation of European higher education zone.

Supporting the main principles, described in the Sorbonne declaration, a number of countries, including Russia, accepted the responsibility to coordinate their policy in order to achieve in the closest future the following objectives, that are considered as the most significant ones for the creation of the European higher education zone and the advancement of European higher education system all over the world:

❖ An acceptance of system of easily comprehended and comparable degrees through the introduction of a diploma attachment in order to provide a possibility of employment in European countries and increase an international competitiveness of the European higher education system.

❖ An acceptance of system that is based on two major cycles – pre-degree and post-degree. A degree that is provided after the first cycle, must be claimed on the European labor market as a qualification of a corresponding level. The second cycle must lead to an obtaining of a master or/and doctor degree, as it is accepted in most of the European countries.

❖ An introduction of credit system according to ECTS type – the European system of relating of labor-intensiveness units credit, as a proper mean of large-scale students' mobility support.

❖ An assistance for the European Union via provision of education quality in order to develop comparable criteria and methodologies.

❖ An assistance for the European views in higher education, especially regarding educational plans development, inter-institution cooperation, mobility schemes, joint education programmes, practical training, and implementation of scientific researches.

❖ An assistance for mobility through overcoming the obstacles of the effective free movement realization, considering the following:

– a student must be provided with an ability to obtain an education and practical training, as well as the accompanied services;

– tutors, researchers, and administrative personnel must be provided with an acknowledgement and accreditation of time period, spent for a research, training activity, and probation period in European region, without affecting their rights, fixed legitimately.

The European higher education zone is being constructed on European traditions of education responsibility before the society, wide and open access to both pre-degree and post-degree training within the whole life period, education and development of personality within the whole life period, and civicism. Since scientific research is the main power that pushes higher education the creation of the European higher education zone must be accompanied by a creation of European scientific research zone.

The European higher education zone must meet the expectations of its partners in the aspect of education services' quality. It is true that quality evaluation must consider objectives and missions of institutes and their programmes. A certain balance is needed between innovations and traditions, academic advantages and social economic necessity, programmes' connection and students' freedom of choice. Free mobility of students, personnel, and graduates is a necessary existence condition for the European higher education zone. Higher education institution of countries that participate in Bologna process, support the orientation for comparable qualifications, based on key differences in pre-degree and post-degree training. An important role in the process of taking such decisions play networks that are created on the foundation of the studied disciplines' homogeneity. And here, first of all, it is necessary to solve the problem of further improvement of mechanisms that provide two-way interaction within all the education problems' range, youth policy, generation of fundamental and applied knowledge of the world level, innovative activity in order to transform the cooperation with such states to the level of international partnership.

A deeper cooperation between educational institutions is supposed under terms of signing various agreements between them on the implementation of coordinated educational programmes. «Global Alliance of Transnational Education» (GATE) is an international union that includes business-organizations, higher education institutions, and governmental structures that are involved in the provision of quality, accreditation, and certification of institutions' programmes, that are offered outside their country.

The prior partner of Russia in educative and scientific-technological area is still France. The main direction of our educative interaction with France is the harmonization of Russian and French education system within European innovation processes. A whole number of Russian-French seminars has been conducted and planned, including some of such topics, as «Single basic European limits, certification systems, methodical manuals», «French language in business communication», and others.

In our cooperation with great Britain the prior attention in topic aspect is paid to the problems of biotechnology, genetic engineering, ecology, and global climate alterations. At the same time mutual projects in the area

of technological prognosis, national scientific-educational system development strategies formation and realization are realized. Together with Great Britain regular contacts on actual problems of national education systems' improvement are carried out.

In order to create additional abilities to increase international academic mobility with a direct involvement of Ministry, interstate agreements with FRG, France, Italy have been signed on topics of simplifying mutual trips, according to which visa obtaining procedures are greatly reduced for scientific-educational transfers' participants. The same goals are achieved via interstate agreements of educational documents' acknowledgement, particularly with Austria, FRG, and France.

The development of international cooperation on adults' education programmes must be founded on a wide informing of Russia's partners on its offered programmes of additional professional, and social education via creation of special web-sites on adults' education and educational portals, international meeting and forums, mutual educational programmes' realization. An importance international education cooperation in the development and stabilization of peaceful and democratic societies is universal and confirmed as the prior one.

COMPUTER TESTING USAGE IN TERMS OF HIGHER PROFESSIONAL EDUCATION: PROBLEMS AND SOME SOLUTION METHODS

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Being based on professional training and administrative activity, authors of this article tried to outline and characterize some major problems of introduction and usage of computer testing in terms of higher educational institution in order to obtain an objective valuation of training process quality in a higher education institution.

Keywords: computer testing, higher educational institution, process quality

According to the National educational doctrine and Russian education modernization program the main objective of Russian educative policy is claimed to be the provision of modern education quality on basis of securing its fundamentality and correspondence to actual and potential personal, social, and state needs. One of the modernization directions is linked to an alteration of control-evaluation activity in order to reach maximum control and evaluation objectivity and increase in their effectiveness in terms of the society informatization. It is explained by the fact that the last decade is characterized by the strengthening of the government role in education management. The present alterations in education area increased the requirements to the control quality in total and to the results control and evaluation in particular. One of the possible knowledge quality indexes is its consistency that is defined by such education principle, as systematicness. The question of education results control and evaluation for obtaining reliable and objective information on the condition and quality of educational achievements is important not only in terms of the education results evaluation, but also for the further prognosis of school children and students' educative-research activity. This problem was and stays in the centre of scientists' attention. Works by Y.K. Babanskiy, V.P. Bepalko, I.Y. Lerner and others cover some most important aspects of education process control organization and implementation. In recent years take place the surveys that allow us to analyse this problem in its relation with modern conditions. It includes a number of doctorate (V.A. Avanesov, N.F. Efremova, V.M. Kanevskiy, M.B. Chelyshkova, N.A. Senognoeva, and others) and candidate (N.M. Khalimova, N.A. Raneyeva, E.N. Lebedeva, S.V. Kozlov, T.A. Ustimenko, N.L. Mayorova, S.S. Volkova, T.S. Veselkova, T.D. Makarova, L.V. Sukhorukova, and others) researches. The requirements to the necessary education results, fixed in standards, are becoming an objective basis for education quality effectiveness criterion development and for the refreshment all knowledge control and evalua-

tion criterion. However, a final broadening of educational institution freedom in the education content formation, future training and upbringing technologies selection put a question of the education area unity on each education level and the equality of documents, discharged by different educational institutions. And here acutely arise the problem of antagonisms solution between the requirements of high quality and competitiveness of higher professional education and insufficient development of objective diagnostic of students' achievements. In governmental higher professional education requirements to the obtained knowledge and skills are formulated. In order to test them test control methods for attestative students' trials are used as the most objective ones. In order to carry out an internet test as an innovative form of students' achievements require the knowledge control standardization. This work must be solved in each separate institution through tutors and administrative apparatus.

Tutors while carrying out a test after studying a definite education subject division (computer, or on paper) must examine the knowledge correspondence to their mark. The meaning of tasks' creation in a test form is affirmed by their universality and the high obtained results' objectivity. We should remark that the latter aspect in understood ambiguously by different tutors.

Founded on their own pedagogic practice, authors outline the following reasons of insufficient effectiveness of a computer testing: low psychological readiness to work with a computer in a limited time regimen; low computer user skills (especially of the human science students).

We also underline that the majority of the students, especially those of younger courses find it easier to work on a studied discipline division on a paper carrier. We think that it is so because paper sheets with printed test form tasks do not cause caution as they are perceived as a usual control work, only in different form. We cannot pass the fact that students who can select their knowledge evaluation method from writing test form or oral form usually prefer the

letter variant. We think that it is related to the fact that they didn't have enough practice for tests not to cause anxiety while being done.

In recent times National accreditation agency set up an internet testing in order to help an institution in the process of creation of specialists' training quality management systems on basis of independent outside evaluation. The solution of overcoming students' psychological unreadiness for an internet testing in different disciplines authors of this work see, first of all, in the creation of personal tests tasks computer bank creation and providing students with the availability of private training in "trying yourself" subject, by solving test from tasks in an unlimited time regimen. We remove the anxiety feeling about the upcoming test by providing students with a preliminary bibliographic list on which a quarter of test tasks were developed. This bibliographic list does not exceed five sources. More often, students are provided with one or two textbooks, and it makes the preparation easier. They can prepare for the test any time they want. Such method decrease psychological unreadiness also because it gives each student a ability to spend as much time as he needs for the task completion. Usage of such method allows us to psychologically prepare students for test form tasks: the stress-stability of the education process subjects is increased and it, no doubt, wind it reflection in the education activity qualitative component; inner motivation for the education activity is increased, besides, the success achievement motivation increase becomes predominant, and that, no doubt, influence the formation of a student value-meaning level. Thus, we consider the education individualization and differentiation principle, but, at the same time we secure the objectivity principle in the education results evaluation.

In our practice of work on the removal of psychological barrier of computer testing, we also use a demonstrative version of FEPO. It gives students additional ability to check their knowledge and readiness for a control knowledge evaluation. Work with demonstrative test version allows students to try a task as many times, as they need, and also allows them not to think about their possible mark that will be registered by a tutor. As practice shows, students who participate in the online-testing for more than one year, do not experience any psychological unreadiness for this kind of work anymore. In our practice these are likely to be students of the fourth and fifth year. We explain it by the systematic work on students' preparation for the test form tasks completion, and also by their practical work with internet-tests within the process of planned knowledge evaluation.

Thus, nowadays, while creating conditions for overcoming students' psychological unreadiness via described methods, we form the test culture that carries valuable meaning today in the context of Russian education modernization. Test culture formation in future will allow us to create adequate attitude towards test form tasks for students and tutors, remove psychological barriers and anxiety feeling while taking such task. For this it is necessary to keep on pedagogue personnel training in this direction and create task banks in test form on the studied disciplines. It is being successfully performed by the authors of this work.

The analysis of factors that prevent the mass practice test usage defined the problem of tests introduction. Among them we can outline a personnel problem: a lack of qualified specialists in the testing area. This side of introduction and education quality control is supposed to be solved by an institution administration.

Participation in the Federal internet testing allows institution administration to define the following aspects: education results' correspondence with the state higher professional education standard requirements in disciplines; tutors' readiness for usage of new information and communication technologies; the effectiveness of pedagogic means and methods, implemented by an institution tutors; students' readiness; material and technical basis condition; factors that decrease education quality.

Professional tutor training, no doubt, has a great significance. Thanks to the completed qualification increase that was approbated within tutor disciplines by tests form tasks, authors achieved relatively high indexes of students' knowledge quality (55-75 %). This work allowed us to prepare and publish a whole number of scientific works in the magazine «Scientific dimensions». Such work goes on considering the principle of scientific content and effectiveness while checking the pedagogue control results. Here scientific content implies the achievement of high pedagogic control effectiveness, and effectiveness considers the problems of control organization with account of time and education level.

For control procedure and results not to cause doubts within the tutors themselves, and also within methodic and authority educational institutions' personnel, we need a control that will be implemented according to the following requirements: control objectivity – its very procedure, results definition, and work evaluation. Those are the main conditions for regular and qualitative students' work motivation; control results obtaining efficiency; coverage of all or a major students' group by a control measure. According to the indexes that were obtained within the testing we can judge on

knowledge assimilability of the standardly-fixed knowledge minimum on a discipline and reveal the real knowledge level.

The internet-testing procedure can become more effective under a close cooperation of an institution with the establishment that organize education quality and monitoring control (testing, accreditation, licensing), and affirm a list of the training programmes and the textbooks that can be used for education and formation of a task bank for the internet testing. As we think, nowadays element of non-correspondence between a subject content and internet-test questions. We also outline, that internet testing question are formulated without correspondence to the testing technology, which makes control procedure more difficult.

Thus, summing up the above, we outline that nowadays within the education modernization an intensive test usage direction goes on not only considering control, but also students' training and development. Revealing students' knowledge level quality is sufficiently objective index of an institution educational process quality. Here the solution of this problem is seen by the authors in the following two directions: by the effort of tutors and by an administrative apparatus organization work. An institution authority must provide the conditions for introduction of testing via providing personnel training. Testing introduction into the pedagogic practice requires a pedagogue basic testing skills training development.

Institution tutors who have the corresponding skills, presence of test tasks banks that were

approved within the studied discipline mastering process, achieve high indexes in checking students' knowledge level quality within a passing control and outside audit in form of annual participation in program «Federal internet-exam in professional education area». We can state that usage of test form tasks in combination with other control means strengthens its regularity, creates possibilities of efficient students' activity correction, reinforces the check-out educative function, activates cognitive activity, and upgrades tutors' labor organization.

The realization of the directions, mentioned above, by joint work of administrative and professor-tutor staff will allow us to more fully and objectively carry out not only the education quality control, but also the work quality of the whole educational institution. Monitoring of information that concern the mastering of necessary knowledge, skills on subject will allow us to find out, how correct and correspondingly to the state educational requirements a department, faculty, institution documentation, and organization methodic provision (work and education plans, educative-methodical discipline complexes, work programmes, etc.) is developed, track down a specialists' qualification level. This aspect is reflected in the quality area policy that is supposed to provide the new formation specialists' qualitative training, those who is able for the permanent knowledge level advancement, and its practical realization in science, production, business for innovative region economy development through the education process integration.

*Materials of Conferences***METHODICAL SUPPORT OF IMPLEMENTATION OF INTERNAL ACADEMIC MOBILITY IN KAZAKHSTAN**

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The Bolognese transformations and the reorganizations are being defined the academic mobility, as the key component of the integrated educational and the constituent part of the scientific space formation, which is possessed by the educational and the scientific programs variety and its diversity, and it is created the conditions for their optimal interaction, at the expense of the comparability, and the mutual recognition. So, the Institutes of higher education, the Academies, the Colleges, the Universities and the Scientific Centers efficient cooperation and the collaboration possibility, and also the learners' and the students' educational trajectories individualization is being appeared.

The comparability is being achieved by the performance score integrated mechanisms, by the educational processes and the teaching ones models convergence and their approaching, by the common characteristics application for the training courses description, and also by their similar structure. As a result, we have:

- the efficient competition and the interaction new possibilities are being created for the Institutes of higher education, the Academies, the Colleges, the Universities and the Scientific Centers;

- the individual educational trajectory choice, the access to the world – wide educational resources, more qualitative educational services receiving are became quite possible for the learners and the students, that is became much easier the experienced personnel and the qualified staves job placement and the employment assistance possibility;

- the fruitful educational cooperation and the scientific collaboration perspectives are being opened for the teachers and the lecturers, the scientists and the scholars;

- the Institutes of higher education, the Academies, the Colleges, the Universities and the Scientific Centers will be faced with the education modernization, the new technologies' introduction intensification necessity under the arisen competition conditions; besides, the profit from the educational services market will be increased.

Theoretically, it is not difficulty for every learner and student to find out himself, the Institute of higher education, the Academy, the College, the University and the Scientific Center, which is appeared to be ready to be taught him during the academic term or the whole year. But, it should be comprehended, that in practice, the foreign Institute of higher educa-

tion, the Academy, the College, the University and the Scientific Center Management will be carried out the student's admission for his teaching and the training, on the basis of the various parameters: the applicant's preparation basic level, the language teaching possession by him, the adequate sufficient classroom fund, and the places in the hostels, in the dormitories, and in the campuses, or in the rental housing sector availability and so on in the receiving Institute of higher education, the Academy, the College, the University and the Scientific Center.

The several restrictions of the financial plan and the fiscal aspect, the visa support and etc. are also be able to be appeared for the outbound learner and the moving out student.

In this connection, it is quite advisably to be designated the accent mark at the internal mobility development, having taken into consideration a series of the objective complexities and the complicacies for the further successful external academic mobility realization.

It is necessary to be taken into consideration, having actualized the realization challenge of the internal academic mobility, that the Kazakhstan educational system, first of all, has been oriented upon the internal market needs and the domestic market demands satisfaction, and their task of its harmonization with the European systems has not yet been set up, equally, as the massive cross – cultural communication. So, the teachers, the lecturers, and the Faculties exchange between the Institutes of higher education, the Academies, the Colleges, the Universities and the Scientific Centers has been carried out in the framework of the probation periods, the in – depth training and the study courses, the occupational skills and the further professional development and the advance training improvement, just in the individual cases, by any means, not having accepted the mass practice forms.

Moreover, the learners' and the students' mobility has been realized even much and still worse: the only transfer practice from one Institute of higher education, the Academy, the College, the University and the Scientific Center just to the another one has been existed, which, in no way, is not quite able to be considered, as the academic mobility, as far as it has not been provided the procedure for the Institute of higher education, the Academy, the College, the University and the Scientific Center return, from which the learner and the student has left.

At present, many Institutes of higher education, the Academies, the Colleges, the Universities and the Scientific Centers academic policy is being reconsidered its main positions, with respect to the internal mobility. So, the internal academic mobility in the Kazakhstan context is being implied, as the cooperation, well as the collaboration with the educational Institutions and the educational organi-

zations, such as: the Institutes of higher education, the Academies, the Colleges, the Universities and the Scientific Centers just quite inside the State in the following organizational framework:

- the learners' and the students' individual initiative;
- the research or the scientific grants programs;
- the joint educational or the research programs organization.

So, today, the realization main challenge of the internal academic mobility program is being concluded in, that the Kazakhstan education, though and is being worked for the internal and the domestic market, but the inter – Institute of higher education, the inter – Academy, the inter – College, the inter – University and the inter – Scientific Center cooperation and the collaboration challenge just in the State has not been yet voiced out. This is being referred to the intensive, the constant and the mass (e.g. not the once – only and the individual one) interaction in the educational and the teaching process. The internal mobility challenges are not being found their systemic reflection in the educational strategies and in the Institutes of higher education, the Academies, the Colleges, the Universities and the Scientific Centers perspective and the long – term plans and the regions. The internal mobility targets and the tasks have not been determined at the Institutes of higher education, the Academies, the Colleges, the Universities and the Scientific Centers and the Educational Administration Bodies level. And this, moreover, that the legal framework of the academic mobility realization has been specified and designated by the normative, the legal, and the methodological and the instructively base of the Republic of Kazakhstan in the field of education. So, the Kazakhstan laws are being permitted to be carried out the necessary academic mobility. Thus, the conditions, which are favorable to the mobility development, are greatly more, than the emerging obstacles, and many initiatives are quite realizable, and they are quite feasible in the framework of the academic freedom, having provided to the Kazakhstan Institutes of higher education, the Kazakhstan Academies, the Kazakhstan Colleges, the Kazakhstan Universities and the Kazakhstan Scientific Centers just in the perspective, including the various and the diverse mobility schemes realization.

Thus, the Kazakhstan common educational space, which is being provided by «The Occupations and the Vocations Classifier of the Higher and the Postgraduate Education of the Republic of Kazakhstan», the State obligatory educational standards existence, having had the educational programs basis, is the most significant factor of the students', the teachers', and the lectures' internal mobility support.

So, the selective component presence is being opened the variation programs and the teaching and the training individualization, and also the educational programs combination creation possibilities.

The credits portability, and the credit units (or ECTS) is one from the most necessary conditions, having defined the mobility realization successfulness. The students' and the learners' transfer from one Institute of higher education, the Academy, the College, the University and the Scientific Center to another has been considerably simplified, as the students and the learners, well as the teachers and the lecturers internal and the international mobility has also become quite possible, thanks to the teaching credit system, having introduced just in all the Kazakhstan Institutes of higher education, the Kazakhstan Academies, the Kazakhstan Colleges, the Kazakhstan Universities and the Kazakhstan Scientific Centers.

Moreover, the internal academic mobility successful realization has been considerably simplified, in connection with the number of the documents development, having provided its methodological support:

- the directions on the academic mobility organization in the framework of the Kazakhstan credits transfer model by the ECTS type;
- the introduction rules and the All – European appendix filling order to the Diploma;
- the methodological guidelines on the educational programs module composition;
- the regulation on the transfer European system application and the credits accumulation (e.g. ECTS) in the educational and the teaching process.

However, we are not able to be said, that the inner academic mobility in the Kazakhstan has already been received the appropriate development and the corresponding progress. So, having systematized the academic mobility development current barriers and the up-to-date obstacles in the Kazakhstan, it is necessary to be differentiated them just in the following order:

- the organizational challenges, having connected with the places providing in the hostels and the dormitories for the non – resident students and the learners, with the conditions making for the credits receiving only by the one – two academic disciplines and etc;
- the students' and the learners', and the Institutes' of higher education, the Academies', the Colleges', the Universities and the Scientific Centers' low level motivation;
- the special financing complete absence, having directed at the further mobility development.

Thus, it is quite possible the above – listed challenges solution at the following mechanisms application:

The Organizing Ones:

- wider to be developed the direct inter – Institute of higher education, the inter – Academy, the inter – College, the inter – University and the inter – Scientific Center cooperation and the collaboration just in the educational and in the research spheres, on the basis of the bilateral treaties and the multilateral agreements, to be intensified the joint educational and also the research programs formation;

- to be passed from the block one to the educational programs block – module structure;

- to be opened the summer semester special educational programs for the mobility providing in the leading Institutes of higher education, the leading Academies, the leading Colleges, the leading Universities and the leading Scientific Centers;

- to be allowed the students' and the learners' registration from the other Institutes of higher education, the other Academies, the other Colleges, the other Universities and the other Scientific Centers at the groups formation for the necessary academic and the educational disciplines (e.g. especially, the ungraded groups for the special academic and the educational disciplines);

- to be created the structural units and the organization departments in the Institutes of higher education, the Academies, the Colleges, the Universities and the Scientific Centers, which are responsible for the mobility support, and they will be carried out the grants search, the students', the learners' and the teachers' and the lecturers' assistance rendering in the applications writing and the filling for the grants, the Institutes of higher education, the Academies, the Colleges, the Universities and the Scientific Centers cooperation and the collaboration, to be decided the organizational matters and the challenges and so on and so forth;

- to be created the Institutes of higher education, the Academies, the Colleges, the Universities and the Scientific Centers staff, the teachers and the lecturers, the students and the learners information system on the academic mobility tasks and the possibilities.

The Recognition Matters and the Challengers:

- to be further improved the academic mobility the inter – Institute of higher education, the inter – Academy, the inter – College, the inter – University and the inter – Scientific Center methodological – normatively provision.

The Students' and the Learners' and the Institutes' of Higher Education, the Academies', the Colleges', the Universities' and the Scientific Centers' Motivation:

- to be developed the mobility assessment and the valuation system inter – Institute of higher education, the inter – Academy, the inter – College, the inter – University and the inter – Scientific Center (e.g. the Chairs' performance and the Departments' indicators);

- to be included the Institutes of higher education, the Academies, the Colleges, the Universities and the Scientific Centers accreditation standards and also the internal mobility performance and the indicators ratings;

- to be introduced the defined ad the specified quotas for the students' ad the learners' mobility just inside the country.

The Financing Sources for the Mobility Creation inside the Country:

- the earmarked funds in the Institutes of higher education, the Academies, the Colleges, the Uni-

versities and the Scientific Centers budgets for the mobility programs financing, having realized in the framework of the direct the inter – Institute of higher education, the inter – Academy, the inter – College, the inter – University and the inter – Scientific Center cooperation and the collaboration;

- the means, having provided by the employers, having concerned in the further specialists' preparation and the experts' training;

- the volunteer sponsoring contribution and the payments just from the enterprising and the business structures;

- the special national and the mobility support departmental funds means;

- the Institute of higher education, the Academy, the College, the University and the Scientific Center non – budget means (e.g. the best students' and the learners' secondment, and also IIIIC sending, at the expense of the directing and sending Institute of higher education, the Academy, the College, the University and the Scientific Center, the outstanding students' teaching and the prominent learners' training financing);

- the mobility participants their own means and the funds (e.g. the paid internships and the paid probation periods);

- the educational loans and the credits.

The System Measures:

- to be created the Internal Academic Mobility Programs, which are the analogous and the similar ones to the European Union (e.g. EU) Programs (such as, «The Erasmus Mundus», «The Socrates», «The Leonardo» and so on and so forth);

- on the purpose of the internal academic mobility and the integrated educational space on the Kazakhstan territory, the educational and the material and the technical, the informational and the intellectual resources application optimization support to be created the network Universities by the main academic profiles (e.g. the technical, the classical, the agrarian ones etc.), the main target of which will be the joint educational programs and the scientific researches realization, on the basis of the bilateral agreements and the multilateral treaties;

- to be changed the necessary approach, at the State educational grant calculation: the average expenditure account of the one student for his teaching and the learner for his training to be made the calculation, having proceeded from the one credit value and the one loan cost, but not from the practice and the training period (e.g. the academic and the school year).

So, the identified challenges and the diagnosed problems have already been conditioned the legal – normatively and the methodological – scientifically basis evolution necessity of the academic mobility. As far as, now, the internal mobility regulation challenges and the problems must be found their reflection in the internal normative, the methodological – organizationally, and the methodological – scientifically Institute's of higher education, the

Academy's, the College's, the University's and the Scientific Center's documents. Then, we shall be given all these documents' the approximate and the illustrative list below:

The Charter. Having taken the consideration the fact, that the Charter is the main internal document of the educational Institution of the higher education, it is quite necessary more complete reflection in the concentrated form of the Institute of higher education, the Academy, the College, the University and the Scientific Center participation major principles in the academic mobility programs; the standards availability, having characterized the subjects' legal status of the academic mobility programs (e.g. the students and the learners, the pedagogical – scientifically workers and the research and the educational staff) and having formed their legal rights realization guarantees system in the Institute of higher education, the Academy, the College, the University and the Scientific Center charter.

There are the main regulations on the academic mobility different and the variant forms. For example:

1. The regulations on the long – term joint educational programs realization.
2. The regulations on the short – term joint educational programs realization.
3. The regulations on the included teaching and the training.
4. The regulations on the exchange and the internship programs.
5. The regulations on the students' probation and the learners' traineeship.
6. The regulations on the grants' allocation for the International Programs participation.
7. The normative and the regulatory documents, having provided the external and the foreign organization involvement for the academic mobility specific forms realization and so on.

So, all the given above – mentioned documents must be contained the completely specific definitions those or other academic mobility schemes, to be registered the every process realization clear mechanisms, definitely to be explained and to be interpreted all its subjects status and the procedure order. Additionally, it is recommended to be given the appendices, having illustrated the documents specific forms, which have already been mentioned and referred in the text (e.g. the printed forms, the orders, instructions and the directions samples and so on).

Also, the internal mobility programs realization stages reflection must be found in them:

1. The Preliminary one – the Institutes of higher education, the Academies, the Colleges, the Universities and the Scientific Centers – the partners, having concerned in the academic mobility realization. Frequently, the Institutes of higher education, the Academies, the Colleges, the Universities and the Scientific Centers are being acted, as the partnerships establishment initiators with the other Institutes of higher education, the other Academies, the other Colleges, the other Universities and other

the Scientific Centers, sometimes the different Institutes of higher education, the different Academies, the different Colleges, the different Universities and the different Scientific Centers representatives are being acquainted during the arrangements carrying out, and they, moreover, are being exercised the mutual interest to each other.

2. The Preparation one (e.g. the organizing work) – the mobility programs realization the protocol/ the contract/ the agreement on intention in the Institute of higher education, the Academy, the College, the University and the Scientific Center, the protocol/ the contract/ the agreement signing by the partner the Institutes of higher education, the Academies, the partner Colleges, the partner Universities and the partner Scientific Centers Rectors and the Chancellors are being made up.

3. The Main one – the protocol/ the contract/ the agreement realization process. This stage is being provided for the agreements working out and their signing – on the double degrees and the diplomas programs, on the exchange programs, on the teachers' and the lecturers' direction creation and so on. The curricula approval process, the students' and the learners' arrival dates approval, and also the other obligatory procedures, which are quite necessary for the teaching and the training, is being begun after the agreement signing. After all this, the documents execution and the registration process for the teaching leave and for the training check out to the partner – the Institute of higher education, the partner – Academy, the partner – College, the partner – University and the partner – Scientific Center is being begun. In the end, after that, as all the necessary formalities have been carried out, the students and the learners are begun for their teaching and the training.

4. The Final one – the credits and the loans, the academic disciplines and the study teaching periods transfer, having received in the Institute of higher education, the Academy, the College, the University and the Scientific Center, just after their returning to the main Institute of higher education, the main Academy, the main College, the main University and the main Scientific Center.

So, the academic mobility, as the external, well as the internal ones, has already been become the quite integral feature and the inseparable character of the modern education, and, afterwards, it will be developed further. That is why, in this connection, it is necessary systematically and methodically to be studied, to be analyzed this process all the main aspects for the further their application by the national educational Institutions and the national educational systems, for the purpose of the education system improvement and its perfection, and also the State's interests, on the whole.

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FUNCTIONS OF EDUCATION IN THE SPHERE OF ARTISTIC CULTURE AND THEIR DIVERSIFICATION IN THE POST-SOVIET RUSSIA

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The post-Soviet Russia, having acclaimed itself as part of Europe, has been elaborating a principally new model of education. The uniqueness of the situation taking shape is prompted by a unification of higher education according to the European standard to achieve integration into the world educational space. These processes also touch upon education in the sphere of artistic culture. Today we witness its «entanglement» into the mainstream of large-scale social processes: expansion of the artistic field; penetration of the artistic beginning into the human habitat; growth of the role of artistic communication; search of new forms for the content of design projects; broadening of the spectrum of artistic languages. First and foremost functions of education in the given area are being changed.

Analysis singles out a tendency to diversification of functions as a priority. This process is a multidimensional and constantly developing phenomenon, which depends on concrete historical, economic, political and spiritual conditions. In a broad sense the diversifications is considered as variety, segmentation spreading of art into new fields of activities, which do not have any functional dependence on the main kind of activity [1, 236].

With regard to methodology education in the field of artistic culture includes the educational process (embracing upbringing as well) and artistic creativity itself, which can not be brought down to art per se. In this respect, it appears possible to single out a purely educational group of functions, i.e. artistic-action group, and, finally, the phantom group which is related to both education and art

itself. We will try to delineate processes occurring inside each of these groups.

The educational group, embracing functions with regard to society and man, is inter-related to humanity education in general. It is a prerequisite to spiritual and practical control of reality by a human being, his emergence as a subject of culture and his own life. Diversification of this group of functions is largely determined by the Bologna process. Its key directions consist in the specification of education; the introduction of the two-level system of education; the accent laid on the practically oriented training in the framework of bachelorship accompanied by a narrower and deeper specialization in mastership; provision of education quality control by independent accrediting agencies as well as broadening of educational mobility of students and continuity of education. Recognition of comparability of qualifications (diplomas) is aimed at universality of knowledge required by the European labour market in the framework of international integration.

Today the direction of artistic education process is being changed by introducing global components into it, as well as borrowings, view-points and objects of reflection. The content of education in this field is naturally connected with a tendency of art to conceptualism: on the one hand, as a process objectivized by the subject, and on the other hand, through special disciplines of art creating the basis of multi-level educational programs. Ensuing from the profiles and directions of training the «narrow-workshop» approach leads to a translation of knowledge exclusively in the interests of the labour market and show-business, and in a broader sense to a loss of a «large-scale» higher education. Meanwhile cultural values serve as an instrument of personality-oriented mastering of reality for fine-arts students, the basis of their professional self-expression and creation.

The group of functions considered here is being corrected also under the influence of post-modernistic philosophy. Instability of understanding of the world and man inherent in post-modernism erodes the normative character and the fundament of the European culture, pedagogy on the whole, acquiring polar scientific assessments. Critics of post-modernism see «the end of pedagogy» in it, absence of pivot and criteria of verity of judgments: «instead of regulatory norms there exists consensus, instead of values certain conventions, instead of the truth – conviction» [2, 302]. Adherents to post-modernism consider these ideas as development of a «new pedagogy», as an opportunity of a radical break-away with the tradition, allegedly imbued with deviations from the rational beginning in life. A repressive character of the institute of education again turns man into «an element of socially organized, technological and production systems» [3, 158–160]. This change of outlook boils down to a consideration of

man as «an oscillating element» in a world devoid of stability [3, 164].

Thus, post-modernistic ideas in pedagogy transform its conceptual apparatus, value and outlook reference-points of teachers. It influences the upbringing function of education in the sphere of artistic culture, which appears to be a «super-function» with regard to humane character of art, its capacity to transform a personality, to subjugate to the ideal of being well-educated.

In the mean time the «informational society» artistic culture itself turns into a giant informational system, and the mode of reading a cultural code is changed. The main bearer of information is a cultural text, an interpretation of which is necessary for understanding of the language of culture. Having become «open» to various interpretations the texts acquire a socio-cultural sense under the influence of human mind. Informational and communication technologies become significant at all the levels of education and in the field of artistic culture. In schools of higher learning computer programs are used in the courses musical instrument studies, composition, orchestration, qualitatively changing the educational process. The students can independently rehearse with a virtual leader of an orchestra, to listen to a performed musical text, to edit its interpretation. At the open concert stage sites informational technologies create an atmosphere of natural artistic communication. It all deepens the content of the communicative function in the sphere of artistic culture.

The group of artistic activity functions is characterized by an inter-relation with the basic functions art dealt with in the research literature [1; 4]. Diversification processes here have stimulated appearance of functions of a special character: clip-organizing, virtual correcting and in-site ones.

The clip-organizing function of education has clearly manifested itself in view mass-media priorities and a decay of interest in reading. As a consequence of this the so called «clip-thinking» appeared influencing comprehension of the surrounding world, the system of value reference-points and the analysis of information. Therefore the part played by artistic education considerably increases. It is capable to resist the mass «epidemic» of the «clip-thinking» and to instill new means of acquisition of socio-cultural experience in the younger generation.

The development of informational technologies, introduction of the Internet into the every-day life and subsequent involuntary involvement of man into a virtual picture of the world initiate the appearance of virtually correcting function of artistic education. However, one can come across many contradictions here: those between the planetary spread of information-communication technologies and the so-called «computer alienation», the desire of a person be concealed within his or her inner world; between broadening opportunities of cultural communications and protection of moral security

within the Internet, etc. In the age post-modernism the virtual reality becomes decisive. In the field of art it positions itself as an artificially created medium, which may transformed from within, producing an illusion of authentic sensations. A general recognition of an interactive influence of the audience in the design, applied decorative art, fashion, advertising is spread onto literature and music, a new type of tele-behaviour being formed. Intermingling of the roles of the artist and the public, obliteration of the borderline between the real and the virtual only enhances incompleteness of the creative act. The virtually corrective function of artistic education initiates a creative search, but informational and communicative technologies per se are obviously unable to stand up to stimulated intellectual requirements of the personality. The virtual picture of the world correcting the esthetic conscience of the personality makes a desire for real communion more acute, because a high spirituality of artistic education is immanently inherent in the Russian culture.

The in-site, or creative function reflects the purpose of education in the field of fine arts, that is, to teach a creative comprehension of the world, a vision of artistic reality in different projections and foreshortenings. Comprehension of a work of art leads to an emotional experience of the in-site, to its creative revelation. Ju. Borev, the author of a number of works on the problem speaks about it, characterizing art as prophecy, with an inherent «Cassandra beginning» [1].

Diversification of artistic creativity function group reproduces various aspects determined by artisticity as an integral feature of art, a criterion of its public and esthetic significance. It is worthwhile mentioning that famous scholar B. Yusov underlines a simultaneous role of art [5], that is, its synchronous influence on the structure, spirituality and social activity of the personality.

Post-modernism being spread in art generated one more group of functions, which has been termed by us as «the phantom group». A «phantom» is a whimsical vision, a ghost, a play of imagination, a fantasy. This group of functions initiated by the development of artistic practice and an orientation onto the taste of «the man from the street» may be referred to both artistic education and art itself. It is a derivative of the virtual conscience of the contemporary personality. Disappearance of constancy, stability, the nucleus makes it possible to consider the post-modernistic art «ashes of the artistic values of the past» [6, 28]. In the post-modernistic world everything turns into a simulacrum, an image without a prototype, an empty shell. Occupying the place of an artistic image, it affirms the priority of secondary functions of art, associated with the material medium and the cultural aura. Regularity and even legitimacy of the existence of simulacrums is supported by fashion, which reflects «shifts» occurring inside culture. The idea of artificial beauty in clothes and bodily signs, fashionable and deliberate

unnaturalness is conducive to a transfer of simulacrum from the artistic practice into realia, thus forming phantom, spontaneous demands of people.

Diversification processes inside the phantom group of functions lead the appearance of the game-like, advertising and manipulative function, the function infantile gift-making, etc. The game function is viewed through a comprehension of life as a text, a play of signs and quotations, requiring destruction [7; 8]. That is why inclusion of life itself into art, its sudden transformation into a game, makes actors of people. This is a characteristic feature of performances with their illusion of a game. Formation of a game-like attitude to the text is inherent in artistic creation, where the use of stylistic and structural techniques relays the text a non-linear and play-like character. Involvement of educational institutions into this process and their interpretation of the game function yields «the results devoid of the status of general necessity and normativeness» [9, 108]. This can be explained by the pluralism of language games.

Advertising and manipulative function, «growing» from mass culture blurs the borderlines of art, unparadoxically mixing it with life in commercials. Meanwhile advertising as a link between the personality and social culture must not be ignored by the artistic and educational practice. It can and must develop a creative potential of people and to form an interest in the spiritual and the artistic. Advertising may serve as a material for comprehension and subsequent analysis, an illustration of different cultural, historical epochs and styles an emotional background of occupation, a theme of creative tasks. The significance of advertising-manipulative function for artistic education is obvious.

The function of infantile gift-making is closely connected with esthetics and consolidation of the beautiful as the end in itself of «fine arts». The beautiful turns into a specific field of spiritual activity, neglects the usefulness and becomes rescue from stress and fatigue, in a way «a spiritual sweetness», simultaneously contributing to a balanced assessment in the world of artistic practice and to the departure from artificiality.

The analysis carried out in this work testifies to the fact that functions of education in the field of artistic culture in the post-Soviet Russia are resting on a very complicated fundament. The aggregate of a double nature condition two traditional groups of functions: the educational and the artistic-creativity ones. Post-modernism as a self-valued segment of the cultural process in Russia at the turn of 20th-21st centuries initiated a diversification of functions and singling out of a third, phantom group. The influence of post-modernism on the cultural atmosphere of the Russian society, a shift of its senses and values proves a relative independence and autonomy of art. Though education in this very specific field is characterized by traditionalism, the global challenges of the epoch don't allow to ignore these stimuli.

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PEDAGOGICAL ASPECT OF EMERGENCY CASE AS PART OF THE TRAINING CADETS OF SEA EDUCATIONAL INSTITUTIONS

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In this article a problem of an extreme situations presence in sea professional activity area is studied along with the risk of vessels accidents. This factor, as well as a number of other specific factors should be considered in pedagogic activity by sea educational institution tutors while training fleet specialists.

Sea environment is an element that is not controlled by or dependent on human, and how well a person is prepared for sea profession dangers defines people's lives, safety of a vessel and its cargo.

A complex of measures linked to the peculiarities of safe sea professional activity ensuring is provided by a Sea doctrine of the Russian Federation up to 2020. It includes: navigation safety; search and rescue; protection and conservation of sea environment.

A securing of navigation and seafaring safety is a complex objective that includes: reliable technical condition of the vessels; vessel crew recruiting with qualified professionals; organization of safe vessel management by seafaring companies; creation and maintenance of effective vessel examination and control; development of land and space means of positioning and safe navigation secure and their maintenance in operative condition; securing of people and vessels that suffer distress safety; accidental-rescue readiness to liquidate oil floods, discharges of dangerous cargo.

«Growing intensity of seafaring numbers and dangerous cargo transportations increase the risk of accidental situations emergence and the possible damage volume. However the major cause of ac-

cidents is the human factor, up to 80% of all accidents (including those with human losses) occur because of the professional mistakes of a man» [2]. Statistic testifies that mistakes made because of the self-confidence felling equal 17,5% of the total mistake number, because of a thoughtless danger underestimation – 39,5%, and because of the danger degree misunderstanding – 43%. [3] Thus, a major number of vessel accidents are man-caused and a definite part of these accidents has one or another psychological factor in its origin. In last five years, the biggest number of accidents happened in 2006-2007. During this period in Russian sea transport happened: 14 catastrophes; accidents – 150; the number of casualties equaled 35 men. On the 11th of November 2007 7 vessel accidents occurred in Kerch strait under a significant accumulation of vessels on raid transshipment complex, an emergency natural-anthropogenic situation arose, and Russian vessels «Nakhichevan», «Volnogorsk», «Kovel», «Volgoneft-139» sunk. Tonnes of oil discharged into the sea and more than 6500 tonnes of sulphur were washed out of the vessels into the sea. The total area of sea surface pollution in Black and Azov Sea water area equaled more than 664 square kilometers. The total length of shore line exposed to a pollution equaled about 183 km, 8 men died or gone missing [3].

«**Sea accident** is an event that results out of the following: a death or serious injury of a man that has been caused by a vessel operation or within it; a person's loss from a vessel that has been caused by a vessel operation or within it; a wreck, an assumed wreck or stop of a vessel; vessel damage; vessel grounding or its movement disability or participating in a collision; damage that has been caused by a vessel operation or within it; environment damage that has been caused by a vessel damage that in its turn has been caused by a vessel operation or within it.

Very serious accident (catastrophe) is an accident that leads to a total vessel loss, a human death, or serious water pollution.

Serious accident is an accident that is not qualified as a very serious one and leads to: a fire, an explosion, grounding, heaping, storm damage, ice damage, vessel body crack or assumed body defect, etc.; or constructive damage that results into a navigation inability of a vessel, such as underwater crack, main engine breakdown, significant crew quarters damage, etc.; or water pollution (independent on the discharge volume); or breakdown that requires towage or assistance from the shore» [1].

All the described accidents that can happen to a vessel, cargo, or people are unfavourable situations, caused by out-of-staff conditions, and action taken by crew in order to save the vessel, cargo, and people are extreme, as they take place under difficult weather conditions and are limited in time to take the right decision that sometimes is related to a self-sacrifice.

Non-professionalism that leads to negative psychological condition that arise and develop under some mental anxiety of naval specialists cause distraction, indifference, underestimation of danger to which a crew is exposed in the sea. It leads to a irresponsibility while implementing professional duties as well as a violation of operation instructions, decrease the specific technical means management actions results and thus provide for accidental situations.

The problem of professional training is permanently discussed by naval specialists on different levels. However, specific actions, taken in order to solve this problem are not enough, and only sectoral educational institutions can carry out the professional training. The sea educational institution students should be trained not only on the specificity of their future speciality, but also on the formation of mental readiness to difficult situations that can occur in sea.

Thus, we can conclude, that unerring implementation of a person's professional duties (functions) is a result of a good special training. It can be provided only if the personal mental qualities of a man are formed within the process of his professional training (professional self-definition – professional training – professional adaptation – skills mastering).

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ON THE PROBLEM OF PROFESSIONAL COMPETENCES

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The significance of the tasks that modern Russian society faces raises a problem of professional level of specialists. Modern and quite actual are the issues of preparing specialists capable of solving complicated social and economic tasks for the development of society. It requires to research the problems of professional competence, of the development of key competences in various spheres of human activity. The problem of efficient conditions for developing professional competences has become very important; the questions are still to be discussed concerning the methods and procedures

used to examine the content and process of acquiring the professional competence of a specialist. In modern science, competence is connected with a certain area of activity and is presented as an integral feature of personality, characterizing his/her desire and ability to realize one's potential for successful activity.

The general methodological foundations for researching problems of professional competence are cultural and historical approach to understanding the self-realization of the personality, to defining its role, place, significance in seeking «actual future field» (L.S. Vygotsky, V.P. Zinchenko); the main conceptions of the psychological theory of activity (A.N. Leontyev, E.A. Klimov, A.B. Leonov, V.D. Shadrikov); principles of subjective – activity approach in our psychology (S.L. Rubinstein, K.A. Abulkhanova-Slavskaya, B.G. Ananyev, A.V. Brushlinsky, V.N. Druzhinin, V.A. Petrovsky, V.D. Shadrikov etc.); structural-integrative approach to studying functional states and self-regulation of psycho-physiological conditions; the idea of personality development, self-determination, the variety of mechanisms of personality development (A.N. Leontyev); problems of life and career success of a personality, conditions for their development (A. Maslow, J. Raven, E. Fromm, V. Frankle, E. Erickson).

Theoretical and practical foundation for researching the problems of professional competence is a scientifically grounded system of permanent education and teaching, based on componential approach in working out professional standards and contents of professional competences. Not less important are the results of research of professional competence in the framework of achmeological approach and working out technologies for personality and professional development. Problems of professional development and success in the career have found reflection in foreign psychological literature. These themes are considered from the perspective of self-identity, psycho-social identity, I-conception, where they point out that the success in the professional sphere is an objective guarantee of successful realization of all other human social functions.

As a result of research and analysis of materials devoted to professional competence, we can point out the following main theoretical conceptions: competence is a new formation of the activity subject, formed in the process of professional preparation, presenting a systematic demonstration of knowledge, skills, professional abilities and personality traits, which allow to solve successfully functional tasks, comprising the essence of one's professional activity; competences are professional features of a person realized in the course of his/her activity; a circle of questions a person is well aware of; a circle of one's powers, rights; the ability of a subject of activity to fulfill the functions in accordance with professional standards; integrated

combination of knowledge, skills and guidelines allowing a person to carry out his/her work in modern working conditions; models of behavior which help achieve desired results; knowledge, skills and qualities of an efficient specialist etc.

We define competence as a qualitative characteristics of the personality development, and competences as the means of describing subjects and types of activity of a specialist which he/she is to master. As the analysis of scientific literature showed, the professional competence of a specialist is determined by a set of competences comprising its structure and able to be demonstrated in the conditions of professional activity. Therefore, to study professional competence it is necessary to examine it in the process of activity, taking into account content peculiarities of organizational and social surrounding, the communicational peculiarities, the requirements of the fulfilled work, values, knowledge and motives of the individual himself.

The individual choice and an active position of a person are reflected in the choice of his/her professional activity, professional development and formation of a specialist. Realization of his/her potential possibilities, perspective of personal and professional growth lead a person to constant experimenting, understood as search, creative activity, possibility of choice, and the decisive element of this situation of the professional development is the necessity to plan, including long-term planning, to predict a situation and make a choice: experience freedom, on the one hand, and responsibility for everything that is and will be going on, on the other hand (S. L. Rubinstein). Modern socio-cultural situation demands great reserves of self-control and self-regulation from a professional personality (D.A. Leontyev); to fulfill successfully this or that kind of activity, one also needs absolute confidence in the ability to realize them in an appropriate situation (A. Bandura). Thus, the degree of personality development (its competence, integral characteristic) determines not only the choice of a professional sphere of activity, but also the choice itself determines the strategy of the personality development in the future.

The main idea of the problem of professional development is the idea of the determination of personality development in activity, that is why a person is studied from the point of view of his/her accordance to the profession and successful activity in it (A.N. Leontyev). Transformations of one's professional activity, its qualitatively new level lead to further personality and professional growth through the formation of necessary competences, which fills the professional activity with new essence (V.A. Petrovsky).

Traditional approaches to assessment of specialist have been replaced by assessment of competences, which allows to increase the reliability of the prognosis of one's professional activity and development of one's professional competence. Because

one of the conditions of professional development and formations of a specialist is a scientific foundation of the system of professional preparation and conditions for developing professional competence of a specialist, our attention was focused on the studying the effectiveness of gamereflexics and development of professional competences. We considered the essence and organizational structure of gamereflexics as a unique instrument of work with a group, in the course of which participants solve real tasks of professional development, because the action of this instrument goes in real time and refers directly to the professional activity.

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**THE HUMANITARIAN SCIENCES
NECESSITY FOR THE QUALITATIVE
AND INCLUSIVE HIGHER TECHNICAL
EDUCATION RECEIVING**

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The scientific and technical progress development is being taken its place in the present – day world. The technical transformations and the reorganizations are being lead to the changes and the reforms in all spheres of the society. So, every new generation will live in the quite another world, therefore, the whole educational system will have to be made itself familiar with the other culture values priorities, which is being constantly changed in itself culture character. The students general and the cultural training and the fundamental knowledge by their mastering, as the most lasting, durable and significant ones in the modern education is getting an enormous amount of more attention to them. This would be permitted to be decided the humanitarian and the technical cultures isolation, the modern thinking and the contemporary comprehension ability and the skills.

Now, we are more frequently and increasingly facing with the humanitarian knowledge challenge by the students perception and the comprehension, having considered the challenge on the humanitarian sciences sense and the setting in the curriculum teaching program of the Technical Institutes of the Higher Education, the Technical Colleges, the Technical Universities, and the Technical Academies. The students part, having occupied such kind of their position, as the humanitarian sciences exclusion from the educational system, confirm, that the knowledge in the field of the linguistics, the national history, the philosophy, and the humanitarian specialization many other academic disciplines in their future occupational activity they would not be

needed to them. Is that so? Having discussed this challenge, we shall note that phenomenon, that the question is on the students, who are being received the humanitarian and the technical education in the Institutes, the Colleges, the Universities, and also the Academies. It, moreover, has been proved, that a man with the higher education, will have to be the multiple developed personality, to know his cultural heritage and his country, and also the whole mankind. We consciously undermine the higher school idea, that is, we voluntarily narrow down our mental outlook, we deprive ourselves the new horizons, and also we retreat from the additional knowledge, having confirmed, that you can well do without the humanitarian sciences study in the Institute, the College, the University, and the Academy.

So, the academic humanitarian disciplines list is quite extensive and voluminous. Thus, it is quite obligatory to be considered the Russian language in all the Institutes, the Colleges, the Universities, and the Academies. It has already been become proverbial and well – known, that the pride feeling for the native language, which is the quintessence in itself the culture, and it is personified in itself the history of the people traditions, is the every person national consciousness indispensable component. The Russian literary language good and the proficient command, efficiently to be communicated ability, to be constructed the texts of the various functional accessories ability and the skill are being become the quite intelligent, civilized and the well – educated person integral components in the every occupational activity.

So, the «speech standards and habits» notion is closely being connected with the Russian literary language. Then, the well – educated person speech has to be the appropriate, meaningful, clean and intelligent one. «It is great pleasure to be listened the intelligent speeches» – the mankind popular wisdom says. So, the speech mastering level – is the most striking indications and the most glaring signs of the person academic literacy and his education. Having well – spoken artificially, a person will be achieved the greatest success in his life without any difficulty, the doors will be opened before him in the quite different and the various spheres of our activity. So, the competent, knowledgeable, and intellectually developed person clearly and exactly formulates his main ideas, he definitely expresses his position. As Horace told, «To express his thoughts and ideas in the right way – it means to think correctly». The illiteracy has always been associated with the laziness, the inattention, and a lack of the professionalism, but the right speech and the literate writing is, as usual, in a price. So, every employer always selects for himself the highly educated employee, who knows his job and his business and he, moreover, is quite able to make himself useful.

Thus, it is quite impossible to be underestimated the foreign languages knowledge potential, at the students formation realization of the value attitude

to the humanitarian sciences. The knowledge in the field of the foreign languages are the start in a great life for the students, as the foreign language for the future specialist and the expert is regarded itself and the production instrument, and the culture part, and also the humanitarian education means. So, the situations developed system is being created all the necessary conditions for the significance awareness by the students of the foreign language fluency, as the self – development, the self – education, and the self – realization means. Thus, the address to the humanitarian sciences has very many positive moments. It is being promoted the personality socialization, it is being accustomed a man to the culture, in the result of which the personality formation is being placed, as the vital functions subject. This also is being widened the man information space, but this is of no small importance. A man is being familiarized with the complex intellectual, emotional, and also to the cognitive activity, to the universal moral – spiritually values, to the national culture. But the humanitarian sciences exclusion from the Technical Institutes of higher education, Technical Colleges, Technical Universities and the Technical Academies will be brought further to the society moral – culturally catastrophe, to the national mentality bases degradation.

The humanitarian and the technical knowledge are being played the significant and the important role in the engineer work. So, the students are being received not only the occupational knowledge, the abilities, and the skills, but they are being formed, as the personalities, having acquired the whole qualities complex, which is much necessary for all of them in the teaching and the training process in the further life. Not only the scientific and technical preparation and the training are being defined the specialist and the expert face, and the knowledge in the field of the humanitarian sciences are being played the increasingly considerable and the important role under the modern conditions. Truly having established himself, as the specialist and the expert recognizes, that the humanitarian sciences have already become quite useful to him, and, moreover, exactly they have become the indispensable component of the invisible, but the engineer successful career reliable basis and the solid foundation.

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LAWS OF SPACE-TEMPORAL SPECTRAL RELATIONS IN THE FIELD OF MULTIPHASE AC INVERTER DRIVES

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The study of AC inverter drives in the case when the number of their phases is more than four allows to find out some basic laws of these systems which does not manifest themselves when the phase number is equal to three or four. Two previously unknown laws of energy efficiency invariance are established in the field of multiphase (i.e. having the number of phases more than four) AC inverter drives. These laws ignoring leads necessarily to the decrease of the multiphase drive system energy efficiency.

Keywords: laws, space-temporal spectral relations, multiphase, AC inverter drives

The study of AC inverter drives (ACID) in the case when the number m of ACID phases is more than four allows to find out some basic laws of these systems which do not manifest themselves when m is equal to three or four. A knowledge of these peculiar laws is of not only scientific (i.e. cognitive), but also great practical importance because these laws ignoring leads necessarily to the decrease of the ACID energy efficiency when $m \geq 5$.

By present time two previously unknown laws of space-temporal spectral relations have been established by the authors of this paper as a result of the corresponding investigations. These laws are true for the case when the motor winding set is symmetric and electromagnetic processes in ACID are steady-state. They are essentially the laws of energy efficiency invariance for the field of multiphase (i.e. having the number of phases more than four) AC inverter drives.

Law of m -invariance

The first of these two laws links the ACID efficiency η , phase number $m \geq 5$ and relative spectra $U^*(c)$ and $B^*(n)$, where $U^*(c)$ is the relative spectrum of the output (phase) voltage $u(t)$ of inverter that is also the AC motor stator phase voltage, c is the number of the voltage $u(t)$ harmonic (i.e. the number of a *time* harmonic), $B^*(n)$ is the relative spectrum of the function $b(\gamma)$ which describes the space distribution of the magnetic induction created by each phase winding of the AC motor stator in the machine air gap within the limits of the motor pole pitch, n is the number of the function $b(\gamma)$ harmonic (i.e. the number of a *space* harmonic), t is a time, and γ is the space coordinate, which is plotting on the space coordinate curved axis $O\gamma$, that runs along entire length of the AC motor air gap ($\gamma \in [0; 2\pi]$).

The above-mentioned relative spectra differ from the corresponding absolute (real) spectra in that the amplitude $A^*(x)$ of some relative spectrum harmonic is equal to $A^*(x) = A(x)/A(1)$, where $A(x)$ is the amplitude

of the corresponding (i.e. of the same name) harmonic of the appropriate absolute (real) spectrum and x is the number of a harmonic ($x \equiv c$ for $U^*(c)$ and $x \equiv n$ for $B^*(n)$).

The values $U^*(c)$ and $B^*(n)$ for all c and n are dimensionless. Therefore both their envelope lines may be constructed on the common two-dimensional subspace (plane) kOd (Fig. 1), where the axis Ok is horizontal, the axis Od is vertical, for $U^*(c)$, and $k \equiv n$ for $B^*(n)$. The values $U^*(c)$ and $B^*(n)$ are plotting on the axis Od .

The above-mentioned law is given the title «law of ACID efficiency η invariance to the ACID phase number m » (or more simply, «law of m -invariance»). It is stated as follows: if $b(\gamma) = \text{const}$ when $m = \text{var}$, then the envelope line of spectrum $U^*(k)$ must lie not above the envelope line of spectrum $B^*(k)$ on the plane kOd to ensure the invariability of the ACID efficiency η when the ACID phase number m is changing (Fig. 1, where I is the area, where the law of m -invariance is fulfilled, and II is the area, where the law of m -invariance is not fulfilled). Besides, the frequency composition of the function $b(\gamma)$ must be identical (at least) to the frequency composition of the voltage $u(t)$ or be wider than it.

The identity $U^*(k) \equiv B^*(k)$ is a particular (the limiting) case of the law of m -invariance.

This law is in some contrast with widely known notion of ACID which was obtained as a result of researches only in the field of 3- and 4-phase AC drives. In particular, according to this notion the sinusoidal version of the function $b(\gamma)$ is always considered the optimal version.

Law of H -invariance

The second law concerns the phase-pole controlled multiphase ACID, i.e. when the phase-pole control mode (PPM) is used in ACID [1-3]. This law links the ACID efficiency η , relative spectrum $U^*(c)$, relative spectrum $B^*(n)$ and integer-valued parameter H of PPM, where $H \geq 1$ (the value $H = 1$ corresponds to a traditional control mode, and the value $H > 1$ corresponds to PPM).

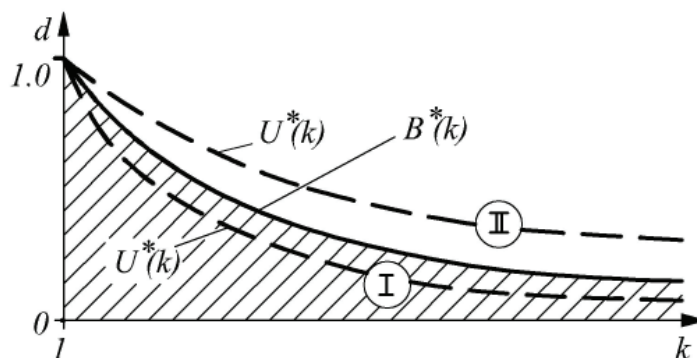


Fig. 1

The essence of the control according to PPM is that in this case the electrical angles between the voltages (or currents) of the nearest phases of inverter increase by a factor of some whole number H without any change of the inverter voltage (or current) amplitude and frequency. During PPM application process, when the parameter H changes, the effect adequate to the synchronous change of the ACID phase number and *number of motor poles* appears.

The above-mentioned second law is given the title «law of ACID efficiency η invariance to the parameter H PPM» (or more simply, «law of H -invariance»). It is stated as follows: the identity $B^*(n) \equiv B^*(H \cdot n)$ must be provided to ensure the invariability of the ACID efficiency η when the parameter H is changing during PPM application process. Besides, for the mentioned purpose the law of m -invariance must also be fulfilled as to spectra $U^*(c)$ and $B^*(n)$ for all values of parameter H (Fig. 2, where the line 1 is the n -dependence of $B^*(n)$ for $H = 1$, the line 2 is the n -dependence of $B^*(H \cdot n)$ for $H = 2$, and the line 3 is the n -dependence of $U^*(c)$).

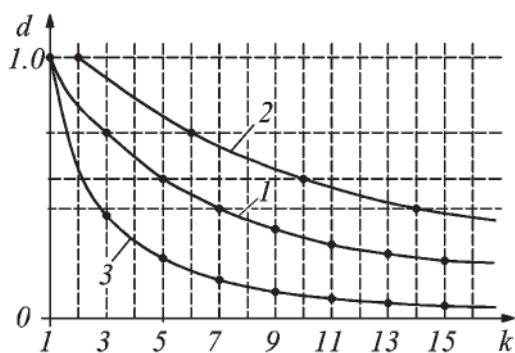


Fig. 2

It is necessary to use some peculiar designs of multiphase AC motors to ensure fulfillment of the H -invariance law [2-4].

Ignoring laws of energy efficiency invariance

If the above-mentioned laws of ACID efficiency invariance are not fulfilled, then the ACID efficiency η decreases and when the ACID phase number m increases more than four and when the going from some traditional control mode to PPM is being attained. For example, m -dependence of the ACID efficiency η is presented in Fig. 3 for the case when the function $b(\gamma)$ is sinusoidal and t -dependence of the voltage $u(t)$ has form of right-angled meander (in this case the law of m -invariance is not fulfilled).

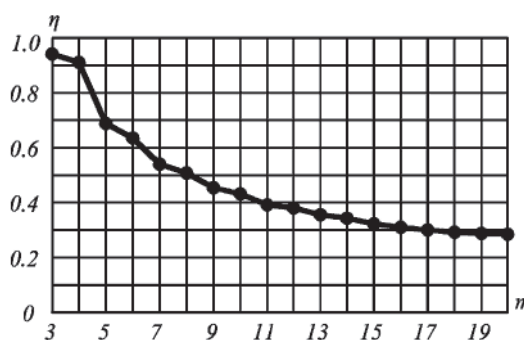


Fig. 3

In support of the H -invariance law the mechanical characteristics (i.e. $\omega - M$ characteristics) of some multiphase phase-pole controlled induction motor with $m \geq 6$ are presented in Fig. 4 for the cases when $H = 1$ (line 1) and $H = 2$ (lines 2 and 3), where the line 2 is the mechanical characteristic if the law of H -invariance is fulfilled, line 3 the mechanical characteristic if the law of H -invariance is not fulfilled, ω is the speed of rotation, and M is the motor torque.

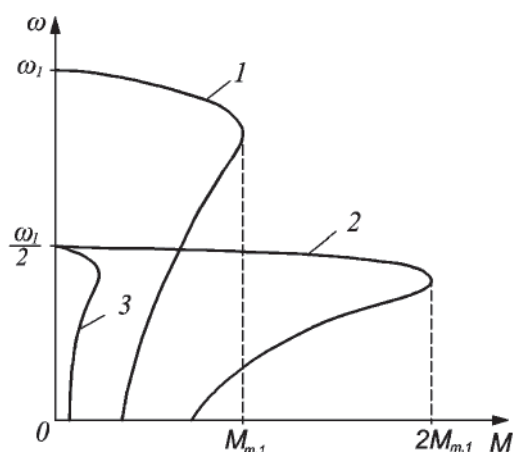


Fig. 4

Conclusion

The above-mentioned laws of ACID efficiency invariance are particular cases of

the fundamental law (or principle), which prevails in the field of multiphase AC drives and may be stated as follows: for the ensuring of maximal energy efficiency of multiphase ACID the laws of space-temporal spectral relations, which acts in the field of these systems, must be necessarily fulfilling during the process of both ACID structural elements design and motor control mode elaboration.

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CARBON DIOXIDE DEPOSITION AND AIR POLLUTION MONITORING SYSTEM BY ADABAS AND NATURAL SOFTWARE

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A system of spatial analysis of carbon deposition on forest cover using ADABAS and NATURAL software is suggested. The system gives a possibility for automatic actualization of data of forest biomass plots and of data of National Forest Inventory System (NFIS) that is synchronized with the interactive map-scheme of territorial arrangement of forest cover carbon. The value of carbon emanating or sink from atmosphere is determined as difference between the value of deposited carbon change and the value of its atmospheric concentration change in some time interval. This gives a possibility for monitoring the level of air pollution by carbon and other greenhouse gases.

Keywords: carbon dioxide, air pollution, air pollution

Nowadays, in condition of permanent productive capacity accretion of the enterprises all over the world, of steady impairment of ecological situation and explicit threat of ecocatastrophe, environmental pollution abatement represents its utter urgency. Unfortunately, environmental conditions in Russian Federation and in the world weren't being radically changed for the better during the last 10 years. And among the factors, which pose the main ecological threats, there are the following: increasing of technical catastrophe risk; food-stuff pollution; water quality degradation; renewable natural resources degradation; global climate fluctuation and air pollution by industrial gases involving greenhouse ones.

Pollution damage becomes more and more perceptible with every passing year. As Russian ecologists say [1, 2, 3] the biggest share in the total volume of gases ejection, that causes the greenhouse effect, belongs to CO₂, and power engineering (its fossil fuel firing) is the main source of it (Fig. 1).

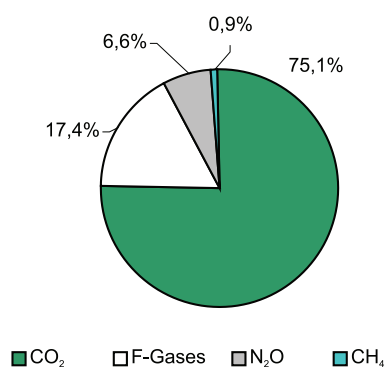


Fig. 1. Gases shares in the total volume of ejection that causes the greenhouse effect in 2006

The gravest consequence of its dissemination is air temperature rise due to greenhouse effect. For the purpose of solution of this problem, the Protocol of the United Nations Frame-

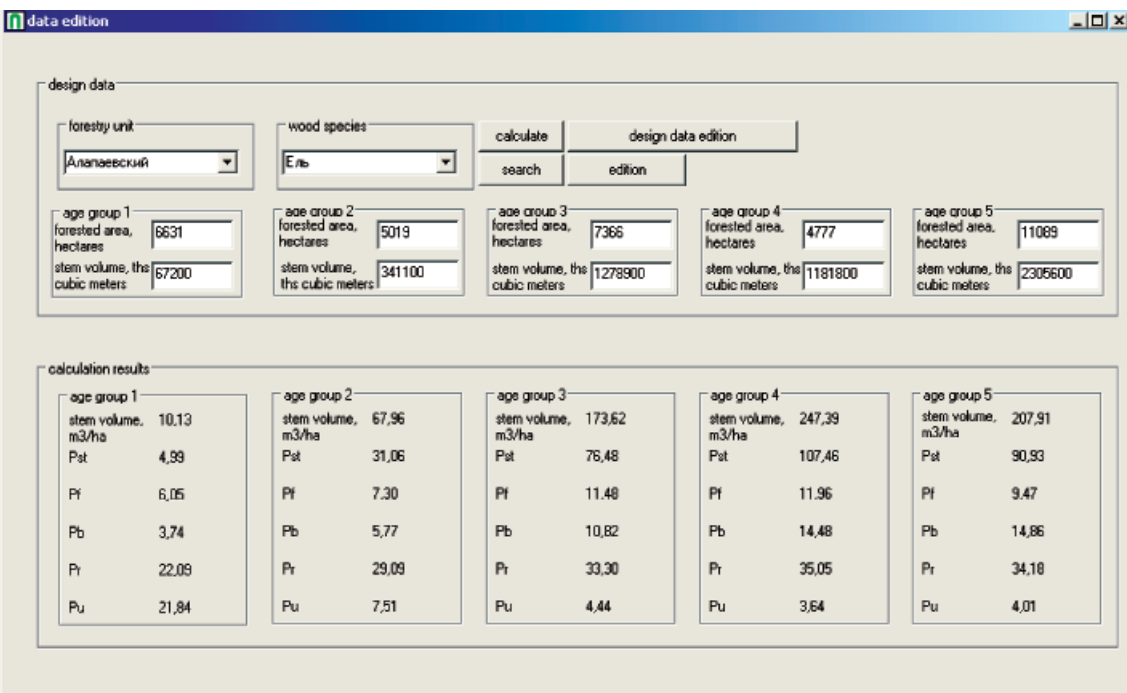
work Convention on Climate Change was signed in Kyoto (Japan) in December 1997. This Protocol, among other things, includes quantitative obligations of developed and transitional economies countries to restrain and decrease greenhouse gases pollution, first of all CO₂, in atmosphere for 2008-2012. 23rd of October 2004 Russian Federation State Duma resolved to ratify the Kyoto Protocol.

In terms of the Protocol requirements implementation, an environment pollution monitoring system design seems expedient. At the heart of this system there is the idea to measure Russian Federation environment pollution level on the basis of the quantity analysis of CO₂, which is deposited by Ural region ecosystems. Based on professor Usoltsev's researches, the carbon deposition spatial analysis information system (CDSAIS) is designed by means of ADABAS and Natural software. Monitoring is supposed to be carried out by CDSAIS results processing with the help of dedicated system in ADABAS and Natural environment. Now CDSAIS includes data of the whole Ural region forestry units. Also, there are possibilities of supplement CDSAIS DB with data of other regions and further extension of the system coverage to state scale.

Within CDSAIS on the base of ADABAS software the experimental data of forest biomass and the data of National Forest Inventory System (NFIS) were combined with replicating the data into NATURAL software according to the following stages:

- 1) plot biomass factual data;
- 2) regression models of biomass fractions, which include NFIS indices as regressors;
- 3) geographical distribution matrixes of areas covered by forest for prevailing wood species;
- 4) geographical distribution matrixes of carbon pool where NFIS indices are the inputs for these matrixes;
- 5) geographical distribution map-schemes of carbon pool in forest biomass for Ural region.

An example of applications created in ADABAS and NATURAL software is displayed on Fig. 2.



design data

forestry unit: Алтайский | wood species: Ель | calculate | design data edition | search | edition

age group 1: forested area, hectares: 6631 | stem volume, the cubic meters: 67200

age group 2: forested area, hectares: 5019 | stem volume, the cubic meters: 341100

age group 3: forested area, hectares: 7366 | stem volume, the cubic meters: 1278900

age group 4: forested area, hectares: 4777 | stem volume, the cubic meters: 1181800

age group 5: forested area, hectares: 11089 | stem volume, the cubic meters: 2305600

calculation results

age group 1	age group 2	age group 3	age group 4	age group 5
stem volume, m3/ha: 10,13	stem volume, m3/ha: 67,96	stem volume, m3/ha: 173,62	stem volume, m3/ha: 247,39	stem volume, m3/ha: 207,91
Pst: 4,98	Pst: 31,06	Pst: 76,48	Pst: 107,46	Pst: 90,93
Pf: 6,06	Pf: 7,30	Pf: 11,48	Pf: 11,96	Pf: 9,47
Pb: 3,74	Pb: 5,77	Pb: 10,82	Pb: 14,48	Pb: 14,86
Pr: 22,08	Pr: 29,09	Pr: 33,30	Pr: 35,05	Pr: 34,18
Pu: 21,84	Pu: 7,51	Pu: 4,44	Pu: 3,64	Pu: 4,01

Fig. 2. Data edition application

In CDSAIS format the equations of biomass quantity dependence upon age and stand volume are calculated for each fraction: stems (P_{st}), foliage (P_f), branches (P_b), roots (P_r) and understory P_u .

The coefficients for biomass dependence equations (BDE) are calculated with the help of Tchebyshev's method [4] (formulas 1-7):

$$\begin{aligned}
 r_{(j_1)(j_2)1}^{(2,2)} &= r_{101} \epsilon_{1(j_1)} + \frac{\delta_1}{\gamma_1} (\epsilon_{2(j_2)} - r_{110} \epsilon_{1(j_1)}) + \\
 &+ \frac{d_1}{c_1} \left[\epsilon_{1(j_1)} \epsilon_{2(j_2)} - r_{210} \epsilon_{1(j_1)} - r_{110} - \frac{\gamma_2}{\gamma_1} (\epsilon_{2(j_2)} - r_{110} \epsilon_{1(j_1)}) \right] + \\
 &+ \frac{\begin{vmatrix} c_1 & d_1 \\ c_2 & d_2 \end{vmatrix}}{\begin{vmatrix} c_1 & c_2 \\ c_2 & c_3 \end{vmatrix}} \left\{ \epsilon_{1(j_1)}^2 - r_{300} \epsilon_{1(j_1)} - 1 - \frac{\gamma_4}{\gamma_1} (\epsilon_{2(j_2)} - r_{110} \epsilon_{1(j_1)}) - \right. \\
 &\left. - \frac{c_2}{c_1} \left[\epsilon_{1(j_1)} \epsilon_{2(j_2)} - r_{210} \epsilon_{1(j_1)} - r_{110} - \frac{\gamma_2}{\gamma_1} (\epsilon_{2(j_2)} - r_{110} \epsilon_{1(j_1)}) \right] \right\}.
 \end{aligned} \tag{1}$$

Basic error:

$$\frac{\sigma_{3,12}^{(2,2)}}{\sigma_3^2} = 1 - r_{101}^2 - \frac{\delta_1^2}{\gamma_1 c_1} \frac{\begin{vmatrix} c_1 & d_1 \\ c_2 & d_2 \end{vmatrix}}{c_1 \cdot \begin{vmatrix} c_1 & c_2 \\ c_2 & c_3 \end{vmatrix}} \frac{\begin{vmatrix} c_1 & c_2 & d_1 \\ c_2 & c_3 & d_2 \\ c_4 & c_5 & d_3 \end{vmatrix}}{\begin{vmatrix} c_1 & c_2 & c_4 \\ c_2 & c_3 & c_5 \\ c_4 & c_5 & c_6 \end{vmatrix}}, \tag{2}$$

where

$$\left\{ \begin{array}{l} \gamma_1 = 1 - r_{110}^2 \\ \gamma_2 = r_{120} - r_{210}r_{110} \\ \gamma_3 = r_{220} - r_{210}^2 - r_{110}^2 \\ \gamma_4 = r_{210} - r_{110}r_{300} \\ \gamma_5 = r_{310} - r_{210}r_{300} - r_{110} \\ \gamma_6 = r_{400} - r_{300}^2 - 1 \\ \gamma_7 = r_{030} - r_{120}r_{110} \\ \gamma_8 = r_{130} - r_{210}r_{120} - r_{110} \\ \gamma_9 = r_{220} - r_{120}r_{300} - 1 \\ \gamma_{10} = r_{040} - r_{120}^2 - 1 \end{array} \right. \quad (3)$$

$$\left\{ \begin{array}{l} \delta_1 = r_{011} - r_{110}r_{101} \\ \delta_2 = r_{111} - r_{210}r_{101} \\ \delta_3 = r_{201} - r_{300}r_{101} \\ \delta_4 = r_{021} - r_{120}r_{101} \end{array} \right. \quad (4)$$

$$\left\{ \begin{array}{l} c_1 = \gamma_1\gamma_3 - \gamma_2^2 \\ c_2 = \gamma_1\gamma_5 - \gamma_2\gamma_4 \\ c_3 = \gamma_1\gamma_6 - \gamma_4^2 \\ c_4 = \gamma_1\gamma_8 - \gamma_2\gamma_7 \\ c_5 = \gamma_1\gamma_9 - \gamma_4\gamma_7 \\ c_6 = \gamma_1\gamma_{10} - \gamma_7^2 \end{array} \right. \quad (5)$$

$$\left\{ \begin{array}{l} d_1 = \gamma_1\delta_2 - \gamma_2\delta_1 \\ d_2 = \gamma_1\delta_3 - \gamma_4\delta_1 \\ d_3 = \gamma_1\delta_4 - \gamma_7\delta_1 \end{array} \right. \quad (6)$$

$$\varepsilon_{1(j_i)} = \frac{X_{1(j_i)} - \bar{X}_1}{\bar{\sigma}_1} \quad (7)$$

Then, by combination of PDE with occupied forested area data and stand volume ones, provided by the NFIS, carbon pool of all fractions for each forest forming species of Russian territorial entities is calculated using the conversion coefficient 0,5 [5]. The results of calculating may be shown as a map-scheme for the whole country or for any of its region (Fig. 3). Annual carbon deposition is calculated as multiplication of carbon pool values by the corresponding coefficient [6].

In order to display the results as interactive maps, the synchronization of database and applications with map editor GIS Panorama 2008. Calculating algorithms, methods of biomass data obtaining on plots and CDSAIS DB features are considered in [7, 8]. DBMS ADABAS and NATURAL development environment features and description are considered in [9-12].

Environmental pollution monitoring necessitates permanent measuring of atmospheric CO₂ concentration. In Russia such measuring is run at Teriberka station (69°12' N., 35°06' E.) According to Teriberka station data [1] during the period of 1997-2007 the following values of CO₂ and carbon concentration and its annual growth were obtained (Table).

Methane, CO₂ and carbon air concentration and its annual growth during the period of 1997-2007 according to Teriberka station data [1]

Year	CH ₄ concentration		CH ₄ concentration change		CO ₂ concentration		CO ₂ concentration change	
	CH ₄ , billion ⁻¹	Involving C, billion ⁻¹	ΔCH ₄ annual growth, billion ⁻¹	Involving C, billion ⁻¹	CO ₂ , million ⁻¹	Involving C, million ⁻¹	ΔCO ₂ annual growth, million ⁻¹	Involving C, million ⁻¹
1997	1857,4	1393	16,9	13	365,9	98,8	2,5	0,7
1998	1871,3	1403	13,9	10	368,3	99,4	2,4	0,6
1999	1872,5	1404	1,2	1	370,8	100,1	2,5	0,7
2000	1867,4	1400	-5,1	-4	371,5	100,3	0,7	0,2
2001	1865,0	1399	-2,4	-1	373,2	100,8	1,7	0,5
2002	1862,6	1397	-2,4	-2	375,5	101,4	2,4	0,6
2003	1879,2	1409	16,7	12	377,6	102,0	2,1	0,6
2004	1871,7	1404	-7,5	-5	379,3	102,4	1,7	0,4
2005	1870,7	1403	-1,0	-1	381,4	103,0	2,0	0,6
2006	1871,3	1403	0,5	0	384,4	103,8	3,0	0,8
2007	1877,7	1408	6,4	5	384,6	103,9	0,2	0,1

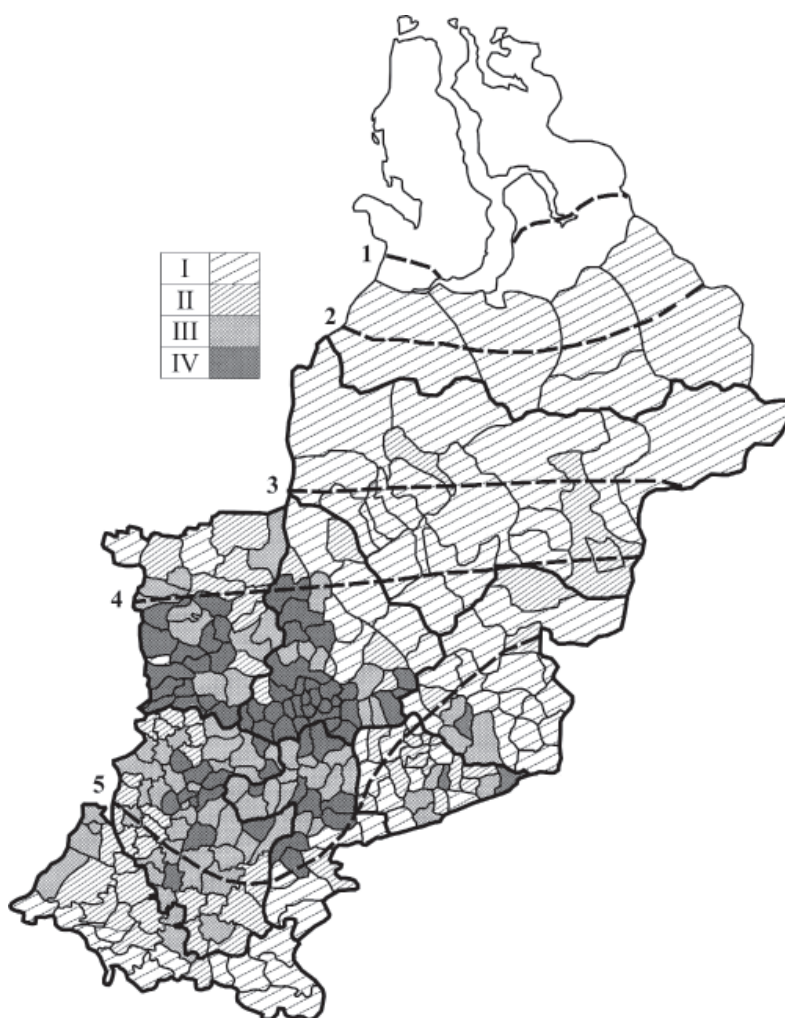


Fig. 3. Carbon pool distribution in forest biomass within forest area of Ural region. Carbon pool gradations, tons per hectare: I – 3,0-38,5; II – 38,5-46,5; III – 46,5-54,5; IV – 54,5-109,5. Firm line indicates the borders between forestry units, dotted line indicates the south borders of the natural zones: 1 – tundra, 2 – forest-tundra, 3 – north taiga, 4 – middle taiga and 5 – south taiga

In order to increase adequacy of monitoring, the creation of extra measuring stations on Russian territory is advisable. In this case, empirical data of regions pollution, rather than averaged data of Teriberka station, corrected by territorial coefficients, which define the pollution level in territorial entities, would be used for the calculation.

The algorithm of Environmental Pollution Monitoring Information System (EPMIS) is represented on the Fig. 4.

As it is showed with the model (Fig. 4), the difference between calculated value of carbon deposition for certain periods of time and CO_2 concentration data of Teriberka station is calculated. This difference per se is the excess of CO_2 , which cannot be deposited by plants. This CO_2 excess, having accumulated in atmosphere,

becomes the source of negative effects in environment, and on conditions that CO_2 emissions level remained the same it would result in irreversible consequences of planet scale.

Also, on the basis of maximum and critical CO_2 concentration limits and the comparison of this limits with the concentration values of CO_2 excess, future environmental CO_2 pollution forecast is available within EPMIS.

The means of EPMIS development environment gives the possibilities to display the results in the following forms:

– Interactive map (Fig. 3). For every region (forestry unit etc.), pointing mouse cursor at a territorial unit on the map, the deposited CO_2 quantity data, excessive CO_2 concentration data, maximum and critical CO_2 concentration limits excess data are displayed.

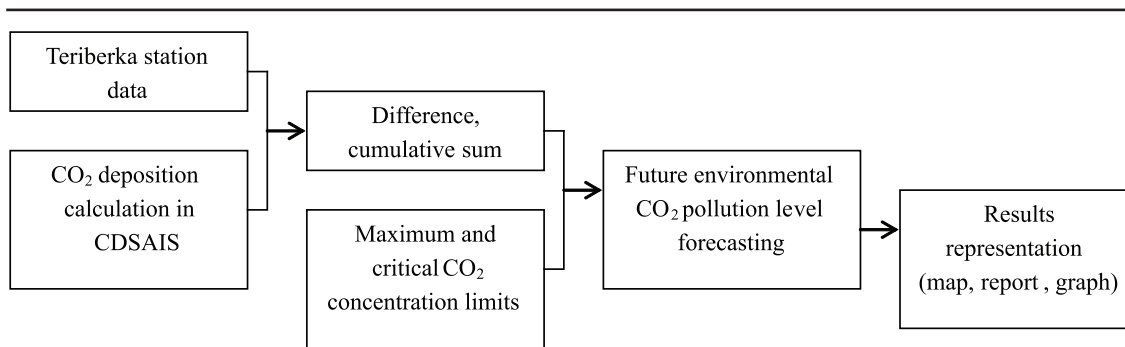


Fig. 4. The algorithm of Environmental Pollution Monitoring Information System (EPMIS)

– Report. The results can be displayed as reporting form.

– Graph. The deposited carbon mass changing, the CO₂ concentration growth dynamics, the fractions shares of plants of different age groups into the total deposited carbon mass, and also pollution level forecast can be displayed in the form of graph.

From the research many benefits were obtained. The main advantages of EPMIS are:

– The possibility of automated recalculating of deposited CO₂ data when: (a) forest biomass experimental data obtained on plots and (b) NFIS data are changed. Synchronization of databases changes with interactive maps.

– The possibility of changing maximum and critical CO₂ concentration limits data.

– The possibility of future environmental CO₂ pollution forecast.

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AUTOMATED MOBILE FACILITY FOR QUANTITY ESTIMATION OF RAW OIL AND OIL GAS, PROSPECTED FROM SUBSOIL

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In this article some aspects of the development of automated mobile control facility (MCF), aimed for estimation of raw oil and oil gas quantity that are retrieved from subsoil and transferring data on the estimation results and their indication on central dispatcher's point.

Keywords: automated mobile facility, raw oil, oil gas, subsoil

The development of informative technologies in automobile transport that are based on usage of controllers, computer technics, microelectronics, satellite navigation, geo-information science, provide for a possibility of creation of operative control and auto-transport management that is involved in transportation process. An implementation of informative technologies and telematics tool facilities is a complex of apparatus and program means, including satellite navigation means that allow us to significantly improve our process of planning, control, regulation, and also significantly improve a service quality within transportation process.

The developed procedure complex within a distributed monitoring system is studied as a measure of organizational, technological, and technical character of the introduction of means and methods for an objective instrumental control of transportation process, founded on usage of management means of satellite navigation, GSM, GPRS, EDGE, 3G, metric waves – radio communication, and also of implementation of specialized equipment (controllers, sensors).

The technology of dispatcher maintainability and transportation process management is realized in their full value, while automatization needs the following functions and realization components [1]:

- Automated current planning that corresponds to a consideration of peculiarities and specificity of transportation process;

- Information maintenance and instrumental accounting of transport work regardless of transportation mean and object;

- Automatic analysis and movement control by instrumental means of transport units localization, communication utilities and program-apparatus means of MCF location visualization on a region map, displayed on a screen;

- Operative communication with drivers, voice and with short text messages;

- Simplified technical assistance call via communication means, placed in the most accessible way for a driver;

- Operative analysis, automated by calculative and program means. This analysis

reflects the information on the transportation work completion level (including a movement time schedule elements control) and provides for an operative movement regulation (as a result, report data on a transportation work completion allows us to reflect a transportation process as real, as possible);

- Convenient and affordable visualization means, as well as other mechanisms of obtaining an actual information of transport movement;

- Automated characteristics transfer that are read by telematic equipment, placed on board of an MCF in order to provide a maximum tracking level of a transported objects parameters.

The main objectives of the creation of automated satellite navigation system of following an MCF, involved into transportation processes on oil prospecting enterprises services are [1, 2]:

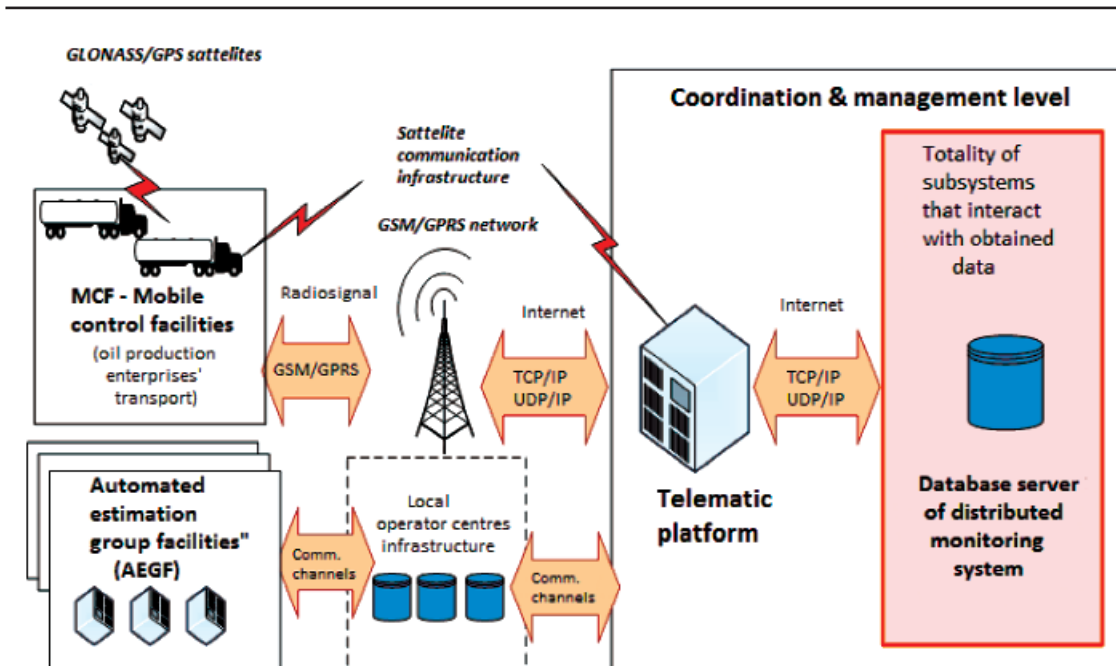
- An increase in a planned MCF movement plan completion quality, an improvement of transport provision for oil prospecting objects, construction sites of oil prospecting objects, and a complex of infrastructure provision (a control of such indexes, as security, accuracy, etc);

- An increase in the effectiveness of mobile structure of different MCF types, labor productivity and production culture, a decrease in direct production costs;

- A transportation process safety increase via informative provision of accidents' consequences liquidation measures, including: momentary reading of a station situation and accident location data transmission to competent reaction bodies, provision of radio communication between drivers and rescue team representatives; operative broadcast of accidents on a route for MCF drivers.

- Operative informing of exploitation object representatives, local oil prospecting objects' control bodies, and also transportation process controlling bodies and structures;

- An increase in dispatcher services' work efficiency via hand operations automatization and implementation of modern telecommunication technologies;



The scheme of information exchange between the navigation systems of AEGF and MCF

– An increase in safety of MCF drivers, transported objects, and MCF within a transportation process;

– Complex informing and diagnostics of all controlled parameters' condition, that are read from an MCF board;

– Operative interaction with road-construction enterprises and data transmission in case of discovering obstacles that make impossible MCF movement on a road;

– A process of technical assistance summoning for automobiles, involved in a transportation process is made as short as possible via automated means of malfunctions on an MCF board location and occurrence.

An automated navigation system of accounting and control of oil production enterprises automobile transport realizes a complex of structure platforms of mutual objectives and functions fulfillment, the most important of which are:

1) An automated monitoring and control of a transportation process with minimal personnel involvement.

The system means provide for an effective fulfillment of the major technological transport control functions:

– Automated control of planned and accidental auto transport means movement on a road network and automated discharge of a plan deviation information;

– Realization of a system dispatcher' management functions that carry out a control and management of automobile transport of oil

production enterprises in a dialog mode with a computer system.

– A formation and display of operative information on various MCF, subdivisions', enterprises' work.

2) Dispatcher control and oil products' transportation products regulation;

3) A securing of information exchange between MCFs and oil prospecting enterprises within an objective accomplishment process, and also under an emergency situation, in order to secure drivers' safety, transportation object and MCF integrity.

The function of selection and transmission of information is carried out via telematic means that are installed on oil production enterprises MCFs. While moving along a route, onboard navigation-communication equipment carries out the process of the MCF location data transmission. Operative reports are formed on basis of information exchange between the global navigation satellite system means (GLONASS/GPS) and onboard navigation-communication equipment. The obtained MCF coordinates are automatically saved in an energy-dependent transmitter memory and are transferred to local operator centres of regional departments via various communication channels (satellite communication, GSM, GPRS, EDGE, 3G, RFID, metric waves radio communication, etc).

Within the process of the obtained information massive formation by local operator centres initial processing procedures are car-

ried out in accordance with the defined system processes. Information exchange between local operator centres and oil production enterprises happens via modern communication means that provide high data transfer speed. These conditions are formed because of the usage of telematic platform as a necessary element of the whole automated control system structure functioning and oil production enterprises MCF operation check-up. The main telematic platform element within the process of information collection and transmission is the telematic server and it is an apparatus system block with an installed server software complex, connected to the internet, and provided with a static IP address. Universal architecture together with simple work algorithms and high throughput ability of a telematic server allows companies to connect up to several thousand user terminals without

any noticeable system performance decrease. To improve a system reliability data flows can be duplicated on another similar reserve server.

For the clearness of information exchange function, an information exchange scheme is provided in picture.

Thus, on basis of Russian system «GLONASS» usage a distributed corporate automated system can be constructed, in which managers have an operative access to a transport work results, regardless of oil production enterprises transport units remoteness.

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*Materials of Conferences***THE COMBINED SPIRAL-SCREWED DEVICE**

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The Spiral-screwed device is intended for simultaneous loading and staining by water suspensions pesticides seeds grain, bean and commercial crops against activators of diseases of seeds and for improvement of sowing potential. The given device consists of the loading and unloading spiral-screwed conveyors established on a frame - bands with wheels and actuating units, the basic bearing, a control panel, the intermediate bunker, capacity with a working liquid and the spiral-screwed amalgamator of dispensing of a liquid with a drive. By means

$$Q_i = \frac{\mu \cdot \pi \cdot d^2}{4} \sqrt{2 \cdot g \left(H_0 + l_i \sin \alpha - \frac{\lambda}{36 \cdot D^5} Q_0^2 l_i + \xi \frac{u^2 \cdot l_i}{2gs} \right)}$$

Change of diameters of delivery apertures depending on length of a highway, according to the received theoretical expressions, allows to carry out uniformity of giving toxic materials on length of the pipeline that corresponds to the agrotechnical requirements shown to pickling devices.

The received theoretical dependence and the developed program for optimisation of the sizes of

of the spiral-screwed conveyor its loading, further grain is carried out gets to the chamber treatments. The working liquid prepares at active hashing by the spiral screw, and then moves to spray apertures that allows to carry out uniform treatment.

Dispensing and mixing with simultaneous transportation liquid toxic materials and biological products on pipes by means of spiral-screwed working bodies is most economic of all known ways in practice.

Prominent feature of the offered installation is its universality and use possibility, as in stationary, and mobile variants. For treatments in the pipeline on a lateral surface on all length of a casing delivery apertures are located.

The expense on length of a pipe through apertures at rotation of the spiral screw will be calculated under the formula:

delivery apertures of the pipeline allows to receive constant account characteristics in amalgamators and bathers.

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Materials of Conferences

**THE ECONOMIC – INFORMATIONALLY
APPROACH TO THE EXTERNAL
ECONOMIC ACTIVITY RISKS
MANAGEMENT**

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The risks management system building with due regard for the macroeconomic conditions (e.g. as in the enterprise's external economic activity, well as in its activity at the internal markets, having considerably depended on the external conditions) is one from the decisive conditions of the enterprise's and the business – group stability and the competitiveness preservation conditions under the global and the worldwide economic crisis consequences conditions. This kind of the approach is presented itself the cost approach realization to the management, having developed in detail in the works of Yu.Ya. Eleneva, E.B. Kolbachev, N.A. Breslavtzeva, and also by the other authors.

The risks management system building, as the every other system is always begun from the management strategy definition, in which the created system target mission is being formulated. So, it should be considered the enterprise economic value added (EVA) rise for the determined and the specified temporary period of time in the framework of the cost approach to the management, as such strategic target mission. Thus, this conception essence is consisted in the matter, that the business which is not being brought the net profit, having exceeded the enterprise owners' capital alternative value, is quite unprofitable. That is why, it is recommended to be used the following type expression, for the enterprise economic value added (EVA) index calculation in the t -th time period:

$$EVA_t = NOP_t - r \cdot NA_{t-1},$$

where NOP_t – the enterprise net profit, having received in the t -th time period; r – the own capital alternative value rate; NA_{t-1} – the enterprise net wealth book value in the $t-1$ time period.

For all this, the VE enterprise economic value added (EVA) from the current economic – efficiently activity for the T predictive time period is being defined, as:

$$VE = \sum_{t=1}^T \frac{EVA_t}{(1+r)^t} = \sum_{t=1}^T \frac{NOP_t - r \cdot NA_{t-1}}{(1+r)^t}.$$

And besides, if VE – is the positive quantity, then the enterprise cost increase for the shareholders has its place, and, in this case, the enterprise activity main target is being achieved. Whereas, VE is quite less or is equal to the zero, then the enterprise activity main target is not being achieved at all. This

condition is defined and the industrial enterprise risks management system objective function. If the management – risk at the enterprise is being promoted to its economic value added (EVA) rise, then its corresponding application is being justified. Whereas, the management – risk at the enterprise is not being promoted to its economic value added (EVA) increase, then its corresponding application is quite impossible to be considered, as the efficient one.

Evidently, the NOP_t enterprise net profit quantity is quite possible to be included in itself the quite different constituents and the various compounds, in particular, having depended on the enterprise operating, the financial, and the investment activities in the t – th time period. This, moreover, is being permitted to be defined the VE , as the functional form, where $VE = F(VE^{op}, VE^{fin}, VE^{inv})$. So, the given external economic functional is quite possible to be presented, as $VE = F(VE^{op}, VE^{fin}, VE^{inv}, VE^{EEA})$, with due regard for the selection in addition to the above – indicated activity types.

Here, we will also take into consideration and that circumstance, that the NOP_t enterprise net profit quantity in the t -th time period, in its turn, is being depended on the enterprise profit margin quantity up to the $EBIT(t)$ percents and the taxes payment and its different constituents and the various compounds, in particular, on the $EBIT^{EEA}(t)$ profit margin quantity, $t \in T$ up to the percents and the taxes payment, having received from the enterprise EEA at the T time interval. Then, it is quite possible to be confirmed, that the VE^{EEA} enterprise economic value added (EVA) constituent and the compound, having defined by its external economic activity in the T predictive period, is being functionally connected with the cash flow, where $CF^{EEA}(t) = EBIT^{EEA}(t) = C^{EEA}(t) - V^{EEA}(t)$, $t \in T$, having defined, as the difference between the $CF^{EEA}(t)$ cash incomes flow, $t \in T$ from EEA and the $V^{EEA}(t)$ cashes flow, $t \in T$ by EEA at the T time interval.

So, the operational risk is being appeared at the enterprise then, when the calculations specificity by the trade or the investment deal is needed the payment realization or the reception and the funds and the means in the foreign currency in the specified and the defined time moment in the future. This kind of the risk is being characterized by the enterprise deficiency and the non – receiving possibility the profit or the loss receiving, as a result of the exchange course changes direct influences upon the expected flow cashes means and the funds.

The exporter, having received the foreign currency for the goods sold, is being lost from the foreign currency drop in its rate, towards the national one, whereas the importer, having carried out the payment in the foreign currency, is being lost from the foreign currency improvement in exchange, towards the national one. Obviously, that the op-

erational risk is quite able considerably to have its influence upon, as the enterprise cash flows, well as upon its profit level.

The character and the typical exports value uncertainty in the national currency for the up – to – date conditions is being consisted in, that if the invoice for it is registered in the foreign currency, it is able to be restrain the exports, as the doubts are being aroused in, that the exported goods, in the final analysis, are quite able to be realized with the following profit. So, the value of imports uncertainty in the national currency, the price for which has been fixed up in the foreign currency, is being increased the losses risk from the imports, as the price is quite able to be appeared the non – competitive one, in the recalculation for the national currency.

Thus, the uncertainty in the exchange rate is quite able to be prevented the enterprise external economic activity its further development. Besides, the foreign currency devaluation and the loss of its value, having undermined the profits and the revenues from the goods exports in the recalculation for the national currency, are being accompanied by the national currency improvement in exchange, and they, moreover, are being resulted in the exports prices increase in the foreign currency, that is lowered the enterprise competitiveness. So, the given effect would be especially negative under the demand conditions, which is much sensible to the change in price. In particular, this kind of the challenge is quite able to be delivered the great concern to the exporters of the machine building production, the motor vehicles, the textile products and so on.

So, the situation is quite able to be served also, as the sales volume quantity instability example, as a result of the exchange rate change, when the enterprise is being taken its part in the tender (e.g. the bidding) for the contract. So, the enterprise is quite able to be comprehended, that the tender, in the national currency, is quite able to be put it in the unprofitable competitive situation, but the tender, in the foreign currency, is quite able to be entailed for itself the considerable operating foreign exchange risk appearance under the enterprise stimulation to the contract price lowering conditions.

The economic risk is being arisen at the exchange currency rate injurious and the adverse effect upon the commodity prices change, upon the manufactured production or for the acquired one, that, in its turn, it has been the influence upon the enterprise economic situation. For example, under foreign currency exchange lowering and the corresponding commodity prices level rise by the exporter – enterprise conditions, it is quite possible its turnover level lowering and its product market and the market outlet part loss of the finished commodity sales and the integrated products distribution.

So, and the importers – enterprises are constantly being faced with the similar situation, having received the invoices in the foreign currency under its rate rise conditions, that it is being negatively

reflected upon the manufactured production sales volumes with the import packaging arrangement, when, for example, the domestic manufacturers and the internal producers are their direct competitors. And the importer – enterprise has come to such kind of the situation, when it is being discovered, that the foreign supplier is constantly being changed his prices for his production, in accordance with his national currency level rise, or the inflation level. The economic risk is being arisen and in the cases, when the enterprise, having sold its production exclusively at the domestic market, and having had the costs, having paid the costs only in the national currency, is being borne the losses, having connected with the national currency rate rise, as the competitive import goods and the wares are quite be much cheaper.

The functional structure of the risks management system in the EEA industrial enterprise, having suggested by V.A. Sychev, in accordance with the management – risk functions realization conception, is quite be able to be considered, as the methodological basis of the corporative risks management challenges solution. For all this, totally, six management functions are being realized (e.g. the Information Function – IF, the Planning Function – PF, the Technological Function – TF, the Organization Function – OF, the Personnel Function – PF, and the Internal Control and Response Function – ICRF).

The information function target mission is the information risks management process provision, which is quite necessary for its significance and the risk situation analysis assessment. For all this, the information function realization, as a rule, is being provided the tasks whole complex solution, to the first of which the exchange rates monitoring organization and, moreover, having influenced the macroeconomic factors upon them, having reflected the international financial and the commodity, and the goods markets development (e.g. the interest rates levels, the trade and the payments balances, the inflation levels, the sales volumes in the retail trade, and in the industrial production and so on) is being related to. The second significant task, having decided at the information function realization, is the procedures development of the crises situations occurrence recognition at the international markets, the further development of which is quite able to be brought to the exchange rates considerable change. All these given procedures' significance is being conditioned by the advance preparation possibility for the unfavorable risk situations beginning at the enterprises EEA budgets administration and its performance.

The target mission of the risks management system planning function in the enterprises external economic activity (EEA) is the possible changes prediction of the $CI^{EEA}(t)$ cash incomes flows expected values, $t \in T$ and the $V^{EEA}(t)$ cashes, $t \in T$ in the T forecast period, owing to the $Cur1(t)$, $Cur2(t)$ exchange rates changes, and also the occurrence

moments prediction of the possible negative situations by the EEA budget articles. For all this, the merchantable risk quantitative assessment is the significant component in the indicated function, from the point of the view of the probable losses significance, or the unplanned incomes acquisition.

The target mission of the risks management system technological function in the enterprises external economic activity (EEA) is the management technology choice by the arising currency exchange risks, that is one or another method choice of their payment, with due regard for the having method advantages and the expenses connected with it. For all this, as a rule, the neutral attitude is being formed to the risk at the enterprise, not having assumed any measures taking by its hedging (e.g. the covered interest arbitrage) in the currency exchange risk low level zone. So, in the rest cases, the enterprise will have to be defined for itself those ones, or the other currency exchange risk challenge solution ways. Otherwise, the manager on the external economic activity (EEA) operations is quite able to be chosen among:

- the uncovered interest arbitrage;
- the 100% – the currency exchange risks hedging;
- the currency exchange risks selective hedging.

The currency exchange risks uncovering policy (e.g. some measures on the hedging non – acceptance) is being justified itself, if the exchange rate sufficiently high – level stability is being waited for in the short – term and in the medium – term periods, that is happened to be extremely seldom under the contemporary conditions. So, in the rest cases, the manager on the external economic activity (EEA) operations has to be decided the currency exchange risks hedging solutions, having selected those or that their covering methods, which are being divided into the internal and the external ones.

The hedging internal methods – these are the currency exchange risk lowering methods, which the enterprise is quite able to be realized independently. So, the following ones are being related to them:

- the Advance Payment. If the importer – enterprise is being waited for the foreign currency exchange rise, in which the Contract for the import deliveries has already been made up, then this kind of enterprise is more profitable to be pre-paid the Contract forward. Similarly, if the exporter – enterprise is being predicted the foreign currency exchange lowering of the Contract for the export deliveries, then it will also be profitable to be suggested to be carried out the advance payment for the importer;
- the Compensation Mechanism Use. This kind of method is usually being used in the situation, when the equipment, the goods, or the services acquisition and its obtaining necessity are being arisen at the exporter – enterprise in the country, where the exporter – enterprise production is being supplied and provided to. Then the exporter – enter-

prise is quite able to be paid for this equipment, the goods, or the services in the country foreign currency, where the exporter – enterprise is being supplied and provided its production, not having bounded itself with any currency exchange risks challenges;

- the Currency Choice in the Payment Documents. In particular, if the selected foreign currency is the national one, then the total receipts and the revenues amount (e.g. the payment) is not being connected with the exchange rate fluctuations for the exporter (e.g. the importer), and the deal adverse Party is being subjected to the currency exchange risk;

- the Selling Prices Change. As it has already been above – mentioned, the exporter – enterprise, having predicted the country exchange rate lowering, where its production is being supplied and provided to, is quite able to be increased, within the certain limits, the selling prices for its commodity, goods and wares, having expressed in the customer country foreign currency, for the impairment estimated percentage. However, in this case, the exporter – enterprise is being subjected to itself the economic exchange rate risk, having left from the operational risk.

The necessary resources reliable provision (e.g. the information, the financial, the material ones and the others) of the risks management all stages is the organization function target mission of the risks management system in the enterprises external economic activity (EEA). For all this, the specialized and the special organizational structure creation, having orientated to the risks management system tasks solution is the given target mission, as the realization main instrument.

The personnel preparation and the efficient use in the risks management process, having provided the workers most creative potential sufficient disclosure in the enterprise EEA organization is the personnel function target mission of the risks management system in the enterprises external economic activity (EEA).

The quality continuous estimate, having created at the risks management system enterprise, and also this quality maintenance at the high level is the internal control function prerogative and the risks management response system.

Thus, it is quite be possible to be concluded, that all the above – listed functions performance is being directly connected with the enterprise management provision of the reliable economic information – the economic – informationally management task solution.

For all this, the accent in the prediction procedures for the urgent derivative instruments, in particular in the option transactions, as the most derivatives perfect form, it should be transferred from the numerical predictive estimations receiving, for example, the foreign exchange rate values, for the qualitative and the interval characteristics prediction of the fundamental indicators trends (e.g. their

directions, forms, origin time intervals, development, ending and reversal of the trends, the change numerical ranges at every from the indicated trend development phases and so on). The predictive numerical and the qualitative characteristics knowledge of the foreign exchange rate trends and other interconnected with it the fundamental indicators are being permitted the manager on the external economic activity (EEA) operations to be synthesized the calculations carrying out efficient strategy on the export – import operations and to be made the efficient decisions on the EEA organization other challenges.

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COMPETITIVE GROWTH OF PENSION FUNDS BY MEANS OF QUALITY MANAGEMENT

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The economic climate having been changed, the existing state social security system based on the principles of solidarity of generations can not guarantee the dignified living standards to pensioners and people who will retire in the nearest future. Financial defined contributions have become the alternative to the distributive system but their formation and functioning are linked with the number of problems. Nevertheless, most of the countries are rejecting from the distributive system nowadays. The main reason why it has happened is the demographic situation which is getting worse in many developed countries. For example, the population of Russia is decreasing at average by 700 thousands of people every year and according to the State Statistics Committee of the Russian Federation, the population will have been a bit more than 100 million people by 2050. Provided this, the proportion of working people to pensioners will be one to one [1]. It is quite obvious that when the number of working people and pensioners is less than the critical value, the government will increase interest deductions to the Pension Fund or will change the age of people who retire. Such actions can be a drag on the expansion of the economy and can lead to intergenerational conflict. All things considered, carrying out a reform of the social security system is really necessary. According to this reform, the process of granting of work pension is transferred to insurance basis which suggests adding funded component of a pension. Thus the mixed type of pension system in Russia has been created.

New pension system in Russia suggests that so-called future pensioners will take an active part in the process of collecting their own pension. While

working people have to control this process individually: whether the taxes are deposited to the fund or not, whether necessary data for pensionable service and insurance payment are transferred to the system of identifying information. Pensionable service will be taken into consideration if insurance contributions have been transferred to the Pension Fund of the Russian Federation. The rate of work pension directly depends on the insurance payment transferred to the Pension Fund of the Russian Federation within the whole period of working career. And it doesn't depend on the duration of employment and average monthly earnings as it has been before.

According to the source of financing a new pension system is divided into retirement benefits and pension insurance. Retirement benefits is funded for the account of consolidated social tax charged out to the federal budget and assignments from the federal budget and concerns people who can't be the participants of this system because of different reasons of work incapacity. Since 2010 consolidated social tax will it is replaced with insurance contributions which will be paid into the budget of funds. Pension insurance which is the combination of insurance component and funded component of work pension is financed by compulsory contributions (compulsory pension insurance) and optional (voluntary) contributions made by legal people and individuals (insurance method of pension financing) [2].

The substantial supplement to a new pension system is the non-state pension insurance which is the supplement to the state pension provision and compulsory pension insurance. It can be carried out only for the account of optional (voluntary) pension contributions to Non-state Pension Funds. People can only appropriate funded component of required premium by means of which to collect funded component of work pension (in this case Non-state Pension Fund is the assurer of compulsory pension insurance). It is possible to make voluntary pension contributions and therefore, to collect occupational pension (non-state pension provision).

The fact that the State has divorced Non-state Pension Fund from money is really important. It means that the Pension Fund itself has no right to invest money into some active assets. They are invested by specialized management companies, which must be subjected to national licensing and control. So such a two-stage system is considered to be more reliable: the Fund raises money but it can't invest it. Only special organizations can do it.

Nowadays there are 290 Non-state Pension Funds in Russia, which have about 360 billion rubles. 6,6 million people have already been involved in the system non-state pension provision, that is about 6,8 percent of economically active population and more than 1700 enterprises [1].

When non-state pension provision being organized, institutional (corporative) Non-state Pension Funds started to develop more dynamically. Their aims were to increase pensions by putting up re-

placement rate for their workers and to provide the conformance of drawn pensions to living minimum wage (minimum income level for survival). They had to find additional sources of pension financing to achieve these aims. It was made due to the funds of enterprises and workers' money. Among corporative Non-state Pension Funds there are «Gasfund», «Surgutoilgas», «Lukoil-garant», «Welfare Fund» (OAO RZD), «Electric-power industry». These funds have been successfully developing and as a result, they have sufficient growth of increments. The number of their clients is decreasing which means that people confide in them [3]. The Funds use advanced methods of management. Today some Non-state Pension Funds have already received the Certificate of Compliance of Quality Management system to the requirements of ISO standard 9000 which raises their competitive ability on service market [5, 6]. The existence of Non-governmental Pension Funds allows to guarantee the dignified living standards to pensioners. Only these funds can provide the replacement rate of earnings lost recommended by the Convention of International Labour Organization which is not less than 40%. Pensioners who are not regarded to be the clients of these funds have the replacement rate which is lower. For example, in 2005 it was 28-30% but in 2008 it was 22% [4]. If we analyse the replacement rate in other countries, we will see the difference. For example, the replacement rate in Finland is 57,5-67%, in the USA – 51%, in France – 60-70% [7].

All the facts mentioned above are the indicative of the fact that Non-state Pension Funds are regarded as a competitor to the Pension Fund of Russian Federation. It is very important for the Fund to guarantee worthy client servicing, high

level of assurance and reliability. In spite of the fact that Pension Fund of Russian Federation actively works on quality improvement, areas of activities aimed at it are different in many regions. Quality management system unified for all regions hasn't been developed yet. Unlike for-profit business organizations, the implementation of approaches of quality management into Pension Fund of the Russian Federation has the number of problems among which are a large number of areas involved, regulatory activity by standard provisions, well-defined hierarchic subordination of its elements and others. That's why scientific research work in this field is of great importance.

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*Short Reports***INNOVATIVE ENTREPRENEURSHIP
IN THE SYSTEM OF THE CONCURRENCE
ENSURING IN THE RUSSIAN ECONOMY**

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In this article it is said about the sense of the Innovative Entrepreneurship and its influence on the concurrence ensuring in the economy of Russia. The actuality of this theme is related to the fact of the realization of the innovation maneuver in the developing of the innovative economic for the country; they are the most important strategic aims for the closest years in this country.

The analysis of the tendency of the world market developing of the XXth and the first decade of the XXIth century was exposed the main particularity: the market developing is in the persistent increasing of the changing, the instability and the unpredictability.

Nowadays the world markets system integration and the regional economies, and also the all of the sphere of the humanitarian activity take place; as a result the rapid economic up growth, the speeding-up of the modern technologies and the management methods are seen to.

The main clause of the way out from the Russian economic stagnancy and the precondition for the stable, competitive and social-orientated to developing of the national economy is the cardinal increasing of the scientific and the innovative activity. Today the problem of the concurrence increasing and the innovative economy developing are the most important and strategic ones for this country. The place and the role of Russia in the world economy and in the policy will depend on the resolving of all of these problems.

It has said about the importance of the construction of the innovative economy for more than one year. The necessity of the Russian economy transition to the innovative development is recognized among the intellectual and power elite.

The perspective of being of the primary products appendage for the world economy is not so impressive one. Unfortunately, the petrol and the gas are the key articles for the Russian export given to the main currency inflow and to the budget taxes.

To make the Russian enterprises high competitive to the foreigners' ones and to the modern reality, it is necessary to make the competitive production and the high quality of the outputting with the low production costs.

The factor of innovative developing is capable to raise the Russian enterprise competitiveness which is included the interrelated making of the scientific and technical, industrial, financial and social

activity in the terms of the new institutional environment.

The most important for the Russian enterprises are not in the choice of the different directions for the innovative developing, but in the understanding of the concept and the methodical approaches to the construction of the valuation influence for the innovative development on the firm competitiveness at the aim of the effective innovative policy. Despite of the enterprise state, its market part and size, and also the organizational and law state, etc., any implanted innovation goes to the profit rising due to the production optimization and the management system.

So, the intensification of the innovative activity of the entrepreneurship becomes the factor of forming of the competitiveness of the different branches and enterprises, its development and the forcing at the modern and important step in the market, social and economical relationships in Russia.

The innovativeness means the company capacity to assimilate the technical innovations related to the technical and technological renovation in the production and also to the social innovations. It is worth mentioning that the business is growing at the defined terms from the entrepreneurship, so, the entrepreneurship activity is the primary step of the development of any enterprise, the organization and the company.

A lot of enterprises in the constant developing and establishing process develop uninterruptedly the concurrence capacity. The business enterprises for its surviving follow the market instructions: to comply with the consumer needs more qualitatively and to the better price for them. This demand presents the aim of the market subjects to obtain the consumer attention and to make them buy these goods.

The creation and the implementation, a wide new product and service spreading, the technological process becomes the key factor of the production volume, the employment, the investment, and of the foreign trade turnover. Here is the most important reserve of the product quality improvement, the economy of the labor and material costs, the growth of the working efficiency, the improvement of the production organization and the raising of its efficiency.

Finally, all of these ones are predetermined the enterprise's competitiveness and their production putting on the internal and external markets, the improvement of the social and economical situation in the country.

To maintain its competitiveness the enterprise needs the innovations. It is impossible to withstand the forces changed the terms and activated the actions of the concurrence without the innovative activity.

The meaning of the innovations is growing more and more with the economical development of the modern society and they are as a struggle instrument of the enterprise's concurrence at all hierarchy levels, e.g. from the separate structural units till the regions and countries, in whole.

So, at the conditions of the modern concurrence, the shortening of the life cycle of the goods and services, the developing of the new different technologies, one of the principal conditions of the concurrent strategic perspective forming of the entrepreneurship structure become more and more its innovative activity.

Lately, the developed organizational and law base for the entrepreneurship performs constantly. Besides, the government realizes the supplementary support measures of the entrepreneurship and the citizens' innovative activity via the forming of the federal target programs.

So, surely, we can say that the modern system entrepreneurship crises will overcome due to the role and the active life position of the entrepreneurs in it.

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Materials of Conferences

INVESTIGATION OF SURFACE LAYERS
FOR POWER DETECTORS
OF ELECTROMAGNETIC IRRADIATION

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It is known [1] that for increasing of transformation coefficient of power detectors of electromagnetic irradiation, it is necessary to increase the coefficient of thermoelectromotive force (CTF) of thermocouple α , to decrease heat capacity of detector C_Q and to increase substrate thermoconductivity (or to decrease the detector thermal resistance R_Q). Decrease of value of C_Q is achieved by decreasing the volume of the detector. For decreasing of R_Q , which in the case of layered form is determined by the substrate properties, it is necessary to use substrate with high specific heat capacity. The operation temperature of hot welded contact of thermocouple depends on operation conditions, the power measured and thermistoric resistance. Usually it lays in the range 220 to 550 K. Therefore in order to increase the value of CTF α it is reasonable to use the most effective low temperature thermoelectrical materials, such as $\text{Bi}_{0.5}\text{Sb}_{1.5}\text{Te}_3$ of p-type of conductivity and $\text{Bi}_2\text{Te}_{2.4}\text{Se}_{0.6}$ of n-type of conductivity [2]. Synthetic sapphire $\alpha\text{-Al}_2\text{O}_3$ better than others suits to the requirements which must satisfy the substrate because it has quite high value of thermal conductivity $k = 2,3 \text{ Wt m}^{-1}\text{K}^{-1}$ and the dielectric parameters $\varepsilon = 11,5$, $\text{tg}\delta = 0,0001$ which are necessary for conjugation of detector with the wave leading track.

The above mentioned requires the necessity of obtaining of qualitative films of as $\text{Bi}_{0.5}\text{Sb}_{1.5}\text{Te}_3$ and $\text{Bi}_2\text{Te}_{2.4}\text{Se}_{0.6}$ on sapphire. However obtaining of the films under consideration is associated with technological difficulties due to thermal dissociation. Vapor of these materials may contain the following components:

BiTe , BiSe , SbTe , Te_2 , Se_2 , Sb_4 . Therefore for maintaining the initial contents in the condensed films some special measures are used [3]. We have obtained the films of $\text{Bi}_x\text{Sb}_{2-x}\text{Te}_3$ and $\text{Bi}_2\text{Te}_y\text{Se}_{3-y}$ on sapphire plates with of (0112) surface structure by the method of discrete evaporation with additional homogenization of the gas phase. The process was realized in the vacuum with base pressure of 10^{-4} Pa. Evaporation rate was determined by the temperature of tantalum heater and by the input amount of bulk deposited material. Substrate temperature can be varied in the range 300 to 700 K. Film thickness depended on the rate and duration of condensation and was about 0.5 to 3 nm. Before deposition the substrates were chemically etched and cleaned by ion bombardment. All films under investigation were deposited at a temperature of evaporator of 1050-1070 K.

Investigations on chemical content, structure, surface relief, specific conductivity, thermoelectromotive force of films obtained at different condensation temperatures have been carried out. Film content was investigated by means of X-ray chemical microanalysis using analyzer "Comeka". The structure was determined with the aid of electronograph and the surface relief was studied on scanning electron microscope.

Films obtained at substrate temperature lower than 420 K had structure of unoriented polycrystals with grain size less than 50 nm. Substrate temperature rise leads to enlargement of grain sizes up to 300-400 nm. At condensation temperature of 570-590 K there is appearance of [0001] texture and both smallcrystalline fraction and separate large grains of sizes of 800-1000 nm. Film surface becomes more smooth. As we consider this may be due to decrease of concentration of appearance centers at low densities and coincidence of two growth modes of the films, that is normal and tangential.

According to results of investigation (Fig. 1 and 2) the film content is not changed up to condensation temperature of 570 K for $\text{Bi}_{0.5}\text{Sb}_{1.5}\text{Te}_3$ and of 530 K for $\text{Bi}_2\text{Te}_{2.4}\text{Se}_{0.6}$ that corresponds to the content of original bulk deposit. Above these temperatures there is steady decrease of amount of volatile components, Se, Te, Sb, that we explain by reevaporation of them from the substrate. This assumption is confirmed by results of measurement of specific electric conductivity and CTF (Fig. 3). Decrease of concentration of Se and Te in the films leads to substantial decrease of the value of CTF. Weakly detectable maxima on the $\alpha(\text{Tk})$ dependence probably are due to optimal grain size and are determined by scattering process at their borders. Substantial increase of electroconductivity of films as condensation temperature rises is due to appearance of metallic phase of Bi and Sb in the films.

In order to obtain films of $\text{Bi}_{0.5}\text{Sb}_{1.5}\text{Te}_3$ and $\text{Bi}_2\text{Te}_{2.4}\text{Se}_{0.6}$ on sapphire with maximal CTF one should not try to obtain perfect crystallographic structure and to increase substrate temperature. The optimal condensation temperatures are: 570-590 K for $\text{Bi}_{0.5}\text{Sb}_{1.5}\text{Te}_3$ and 510-530 K for $\text{Bi}_2\text{Te}_{2.4}\text{Se}_{0.6}$.

Atomic concentration of Bi, Sb, Te in the films of $\text{Bi}_x\text{Sb}_{2-x}\text{Te}_3$ on sapphire, obtained at different condensation temperatures: 1-Te, 2-Sb, 3-Bi.

Atomic concentration of Bi, Se, Te in the films of $\text{Bi}_2\text{Te}_y\text{Se}_{3-y}$ on sapphire, obtained at different condensation temperatures: 1-Bi, 2-Te, 3-Se.

Values of CTF and specific electric conductivity of films of $\text{Bi}_x\text{Sb}_{2-x}\text{Te}_3$ and $\text{Bi}_2\text{Te}_y\text{Se}_{3-y}$ on sapphire obtained at different condensation temperature: 1- α , $\text{Bi}_x\text{Sb}_{2-x}\text{Te}_3$, 1,3- α , $\sigma \text{ Bi}_x\text{Sb}_{2-x}\text{Te}_3$, 2,4- α , $\sigma \text{ Bi}_2\text{Te}_y\text{Se}_{3-y}$.

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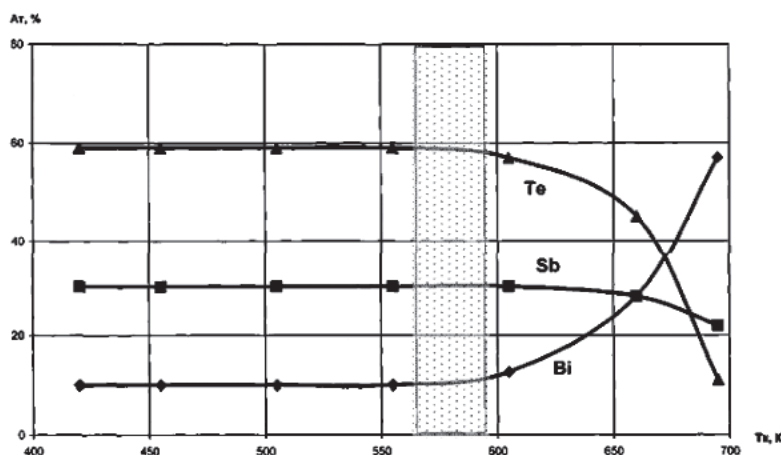


Fig. 1

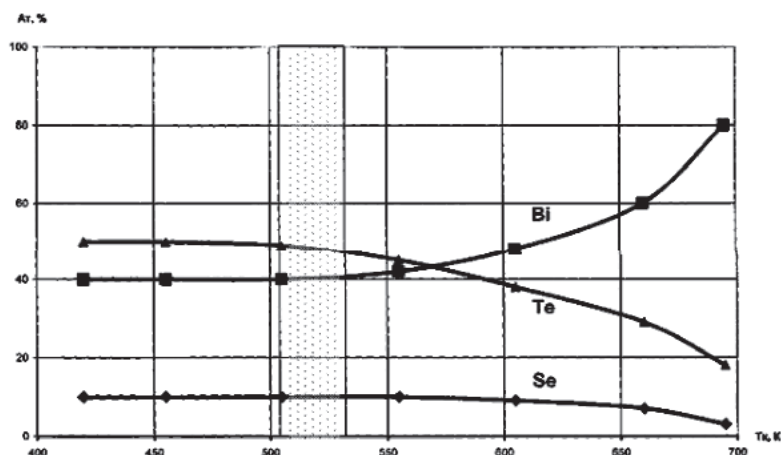


Fig. 2

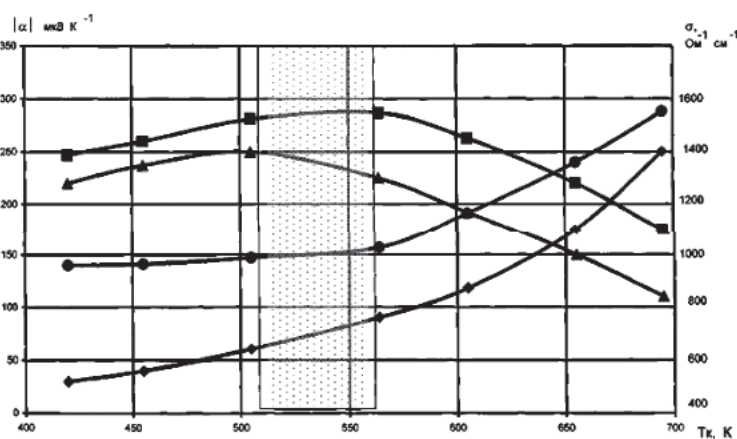


Fig. 3

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Short Reports

**INFLUENCE OF CONDITIONS OF
INOCULATING MATERIAL PREPARATION
ON ACCUMULATION OF AROMA
BUILDING SUBSTANCES IN CULTURE
OF EREMOTHECIUM ASHBYI GUILL**

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The ascomycete *Eremothecium ashbyi* is known as an overproducer of riboflavin and essential oil, which basic aroma building components are geraniol and β -feniletanol [1, 2, 4, 5]. It is known that the inoculation of fermentative nutrient medium should be made by freshly sprouted fungus spores for achievement of maximal riboflavin efficiency of *E. ashbyi* [3]. The influence of inoculating material morphophysiological state on formation of essential oil components has not been investigated yet.

Material and methods. The strain *E. ashbyi* VKM F-3009 served as an object of researches. An inoculating material was cultivated on liquid nutrient mediums of various composition (g/l): soya-saccharose (a soya flour – 20; sucrose – 20, pH 7,0) and glucose-peptone (glucose – 7,5; peptone – 4,0; sodium succinate – 2,0; K_2HPO_4 – 0,5; inositol – 0,14, pH 6,5) at continuous shaking within 24-72 hours. Fermentation was carried out on a soya-saccharose liquid nutrient medium within 55 hours. The volume of inoculant was from 1 up to 5% (v/v). The aroma building substances were extracted from cultural liquid by diethyl ether and were analyzed by gas-liquid chromatography with use of the internal standard [1].

Results and discussion. The fermentation results, received at cultivation of an inoculating material of various age, are presented in the table 1. It is visible

from this evidence that the cultivation of an inoculating material during 2–3 day was favorable for accumulation aroma building substances. The microscopic analysis has shown that at this moment the fungus mycelium is presented by strongly expanded hyphae (diameter 12-16 microns) with greater number vacuoles and numerous inclusions. This corresponds to a stationary growth phase of culture. Thus, the glucose-peptone inoculating medium provided higher output of essential oil components in comparison with soya-saccharose. The greatest level of accumulation of aroma building substances has been reached in those variants where inoculant was brought in the fermentative medium in quantity of 5% (v/v).

The lead experiments have not revealed connection between spores building activity of inoculating culture and results of fermentation. So, the spores quantity increased from 0,2–0,5 up to 6,0–7,0 million/ml after addition of a barmy extract to glucose-peptone inoculating medium. However, it did not lead strengthening of essential oil accumulation during fermentation (accordingly $121,8 \pm 4,2$ and $109,9 \pm 27,5$ mg/l).

Thus, according to the received data the optimal inoculating material for production of essential oil by *E. ashbyi* is the producer culture which has been grown up on glucose-peptone medium within three days (a stationary growth phase), brought in the fermentative medium in quantity of 5% (v/v). The resulted indexes do not coincide with recommended for industrial conditions parameters of *E. ashbyi* inoculating material for maximal synthesis of riboflavin (freshly sprouted spores) [3]. These data should be considered at elaboration of biotechnology of aromatic products reception on the basis of *E. ashbyi* cultivation.

Influence of period of inoculating material cultivation on biosynthetic activity

Inoculating nutrient medium	Period of inoculant cultivation, day	Content of main aroma building components, mg/l of cultural liquid	
		geraniol	β -feniletanol
Soya-saccharose	1	45,9	4,0
	2	44,3	25,6
	3	46,9	25,0
Glucose-peptone	1	47,2	12,4
	2	52,2	18,7
	3	65,8	28,6

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