



**EFFECT OF CELLULOSE STRUCTURE ON ENZYMATIC HYDROLYSIS
AND YIELD OF BIO-ETHANOL**

M. Ioelovich, E. Morag

Designer Energy Ltd, Rehovot, Israel

bd895892@zahav.net.il

ABSTRACT

Influence of structural characteristics of various cellulose substrates on enzymatic hydrolysis and yield of bio-ethanol (Y) had been studied. It was found that degree of polymerization has a negligible effect on the content of formed glucose and ethanol. Such characteristics as the pores volume and crystallinity have an essential impact on the conversion degree (CD) cellulose into glucose and yield of ethanol. The crystallinity (X) has the highest effect. The linear dependences $CD = f(1-X)$ and $Y=f(1-X)$ were established both for non-dried and dried cellulose samples. Drying of the wet substrates causes some decrease yield of bio-ethanol due to irreversible collapse of the pores volume.



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**TRANSLATIONAL ROTATIONAL MECHANISM OF MATERIAL TRANSFER BY
MACHENING OF THE ALLOY Co67Ni5Nb SURFACE**

L. Kveglis¹, R. Abylkalykova, G. Tazhibaeva, A. Sadibekov²

¹Siberian Federal University, Russia, ²East Kazakhstan State Technical University, Kazakhstan
kveglis@iph.krasn.ru

ABSTRACT

Methods of scanning electron microscopy are used for investigations of structural features distorted ply on surface of hard metal alloy Co67Ni5Nb. Areas of localization of deformation are revealed. The explanation of explosive crystallization reasons and dendrites growth in areas of localization of deformation on the surface strengthening by steel small balls is offered.



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**DYNAMICALLY VULCANIZED THERMOELASTOPLASTICS BASED
ON BUTADIENE-ACRYLONITRILE RUBBER AND POLYPROPYLENE MODIFIED
NANOFILLER**

S. Volfson , A. Nigmatullina , N. Okhotina , R. Sabirov , E. Gotlib
Kazan State Technological University, Kazan, Russia
egotlib@yandex.ru

ABSTRACT

Oilpetrolresistant dynamically vulcanized thermoelastoplastics based on butadiene-acrylonitrile rubber and polypropylene with montmorillonite as a nanofiller were developed. By mixing of nanofiller with elastomer the best properties of this material are achieved.

**PRODUCTION PROCESS OF EPOXY POLYMERS BY MEANS OF CURING
SYSTEMS OF TRIALKYL(ARYL)PHOSPHATE COMPLEX OF
METALCHLORIDE AND TRIETHYLENETETRAMINE**

E. Zinovjeva, V. Efimov¹, O.Volkov²

¹The Chuvash State University named after I.N. Ulyanov,, ²The Cheboksary Polytechnic Institute (branch) of Moscow State Open University . Cheboksary, Russia volgamgou@mail.ru

ABSTRACT

The method of obtaining epoxy polymers by means of successive fulfillment of processes of polymerization of epoxy resin ED-20 by trialkyl(aryl)phosphate complexes of Lewis acids and by postcuring of derived prepolymers under the action of triethylenetetramine was worked up. Kinetic rules of polymer formation reactions were studied. It demonstrated that the considered two-phase method allows to regulate characteristics of epoxy polymers at the expense of changing correlation of polymerized and polycondensation grids. It established that epoxy polymers, obtained by using curing systems trialkyl(aryl)phosphate complexes of a Lewis acid and triethylenetetramine, are characterized by high physicommechanical properties and fire-resistance.

**THE SIGN-ALTERNATING THERMOELECTRIC EFFECT
IN MAGNETIC VISCOSITY ALLOY Fe₈₆Mn₁₃C**

U. Panichkin, R. Abylkalykova¹, L. Kveglis, V. Semchenko²

¹ East Kazakhstan Technical University of D.Serikbaeva, Ust-Kamenogorsk, Kazakhstan. ² Siberian Federal University, Krasnoyarsk, Russia kveglis@iph.krasn.ru

ABSTRACT

In this paper the temperature dependence of the thermal electromotive force for samples of alloy Fe₈₆Mn₁₃ is observed. It was established that during heating the sample behaves as a thermocouple. This feature is explained from the standpoint of coexistence in the samples of the crystal and magnetic structures inhomogeneities.



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**RESEARCH OF THE FINE-GRAINED CONCRETE MODIFIED
BY NANOADDITIVE**

N. Lukuttsova , E. Matveeva, S. Lukashov

Bryansk State Academy of Engineering and Technology, Bryansk, Russia
molekulka.22@mail.ru

ABSTRACT

The purpose of the given work is the research of the additive "NANO-F" containing stabilised nanosilica and its influence on structural and strengthening characteristics of fine-grained concrete (FGC).



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**APPLICATION OF NANODISPERSED SCHUNGITE AS FUNCTIONAL
CONCRETE ADMIXTURE**

N. Lukuttsova, A. Pykin

*Bryansk State Academy of Engineering and Technology, Bryansk, Russia
Leshkin22@rambler.ru*

ABSTRACT

Physical and mechanical properties of fine-grained concrete modified by nanodispersed admixture such as water suspension of schungite (Karelia, Russia) are investigated. Schungite is a natural petrified organic silica gel with 51-67% silica dioxide and carbon 28-32%. Admixture was obtained by ultrasonic dispersion [reduced to powder](#) schungite in water in the presence of the stabilizer.

ON CERTAIN PROBLEMS OF THERMODYNAMIC ENTROPY

E. Barsky

Jerusalem College of Engineering, Jerusalem, Israel

eugene@jce.ac.il

ABSTRACT

The notion of entropy was introduced about 150 years ago. However, attempts to define its physical meaning more precisely are being made up to now. From time to time, discussions on entropy cease and then recommence again. The analysis of physical meaning of this parameter at mixing of gases leads to obvious paradoxes. The situation becomes especially paradoxical at the separation of gas mixtures. Theoretical energy consumption established proceeding from compositions of the component gases is many orders of magnitude less than that required for the realization of such processes. As the analysis has shown, overcoming of these paradoxes is based on a more precise definition of the physical meaning of entropy. To introduce the necessary logics and clarity into this problem, we have to revert to this and other parameters forming the basis of thermodynamics since long ago.



THE GIANT RESONANCES AT DISPERSE INTERACTIONS OF NON-METALLIC PARTICLES AND EXAMPLES OF THE COMPOSITE MATERIALS MODIFIED BY ASTRALENES

A.N. Ponomarev¹, O.L. Figovsky²

¹Science & Technical Center of applied reseches, St-Petersburg, Russia, ²Polymate Ltd., INRCMigdal-Ha-Emek. Israel figovsky@netvision.net.il

ABSTRACT

The results of the Maxwell's equations solving for the Relay's approach to the task of electromagnetic waves falling down on the non-metallic particles are discussing. It was founded that for toroidal particles the amplification gain of electric field gradient is amount to 4×10^4 . This phenomenon can influence on the disperse interactions of the particles in different medias. Several kinds of the medias modified by astralenes have demonstrated non-linear optical, electro-physical and mechanical properties.

**WATER SOLUBLE CARBON NANOCLUSTERS AS MICROBICIDES
WITH ANTI-HIV ACTIVITY**

A. V. Gilyazova.^{1,2}, G.V. Kornilaeva², A.N. Ponomarev³, V.A. Chereshev⁴, E.V. Karamov^{1,2}
NRC Institute of Immunology FMBA Moscow, Russia, ² Ivanovsky Institute of Virology RAMS. Moscow, Russia. ³ STC of Applied Nanotechnologies Ltd., St.Petersburg. Russia, ⁴ Institute of Immunology and Physiology, Ural Branch of RAS. Yekaterinburg, Russia 9293522@gmail.com

ABSTRACT

Taking into account the increase in the number of new HIV infections among women, especially in developing countries, the development of topical microbicides is an important part of comprehensive measures to prevent HIV/AIDS. In this work we investigated the water-soluble adducts of carbon nanoclusters (ACNC), which are active against strains of HIV-1, for the development of anti-HIV microbicides. All tested water-soluble adducts of carbon nanoclusters, which differ in method of preparation (reference, № 2, № 5, № 6, ACNC-1, and ACNC-2 solution), are low-toxic to cells CEM SS: 50% toxic dose was not achieved. Study of antiviral activity showed that water-soluble adducts of carbon nanoclusters have a low inhibitory activity against HIV-infection in vitro. 50% effective dose (ED50) of this group of researched substances is in the range 21.4- 27. µg/ml. It was revealed significant virucidal effect: all the samples can inactivate the virus, preventing infection of target cells. The most effective drug is a light fraction of ACNC-2.

**STRUCTURE OF CHIRAL AND SPIRAL NANOTUBES
OF ARBITRARY COMPOSITION**

I.K. Nasyrov., D.M. Pashin , Z.Ya. Khalitov , D.N. Valeeva
Kazan State Technical University, Kazan. Russia
d_pash16@mail.ru

ABSTRACT

The spreading of chiral indexes, expressed in unit cells, on the description of structure of cylindrical layered nanotubes of arbitrary chemical composition is offered. The cylindrical coordinates of atoms of chiral and circular nanotubes of arbitrary composition are obtained, the problem of multilayer nanotube is considered. The coordinates of atoms of spiral (roll) nanotube of arbitrary composition in models of an elastic and strong layer are obtained.



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**DEVELOPMENT OF NANOSTRUCTURED COATINGS
FOR TOOLS AND TOOLING APPLIED IN AIRCRAFT
GAS TURBINE ENGINE PART CUTTING**

T. Kozhina, V. Eroshkov,

P.A. Solovjov Rybinsk State Academy of Aviation Technology, Rybinsk, Russia
proectnir@rgata.ru

ABSTRACT

The problem of GTE part cutting by developing functional nanostructured coatings for the new generation cutting tools and tooling with advanced wear-resistant properties is considered.



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**NDT TESTING AND IN-SITU DIAGNOSTICS OF NANOSTRUCTURES AND
PARAMETERS OF FUNCTIONAL COATINGS OF GAS TURBINE ENGINE PARTS,
TOOLS AND TOOLING APPLIED FOR THEIR MANUFACTURE**

T. Kozhina, V. Eroshkov, A. Lomanov

*P.A. Solovjov Rybinsk State Academy of Aviation Technology, Rybinsk. Russia
proectnir@rgata.ru*

ABSTRACT

The issue of specific equipment development for in-situ diagnostics of nanostructures and gas turbine engine part functional coating parameters, as well as that of tools and tooling for their manufacture is considered.



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**RECONSTRUCTION OF BUILDINGS WITH CHANGED STRUCTURAL MODEL.
INTERACTIVE METHOD OF DESIGN
(Israel Experience)**

E. Voiczek¹ E. Melamed¹, V. Babaev¹, D. Beilin²

*¹CUBUS Eng. Software, Raanana, Israel, ²Polymate Ltd.-INRC, Migdal HaEmek, Israel
eliezer@cubus.co.il*

ABSTRACT

Procedure of stage-by-stage creation and analysis of the changeable structural model of a building during its reconstruction with consideration influence of constant, temporary, seismic and wind loadings is discussed.



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**DEVELOPMENT OF ENERGY CONSERVATION SYSTEM FOR
STABILIZING OPERATION OF MINING MACHINES**

T. Kumykova , V. Kumykov

*East Kazakhstan State Technical University, Ust-Kamenogorsk, Kazakhstan
ktm60@rambler.ru*

ABSTRACT

The article assesses the modes of consumption of compressed air by processing equipment with compressed air. It is proposed to introduce a hydro- pneumatic accumulator of compressed air into the underground mine of pneumatic energy complex. This will allow stabilize the pressure in the pneumatic shaft, thus improving the productivity of the pneumatic mining machines and reduce the cost of electricity for the production of compressed air.



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**MATHEMATICAL MODELING DYNAMIC PROCESSES OF
HYDROPNEUMATIC ACCUMULATOR OF COMPRESSED AIR**

T. Kumykova , V. Kumykov

East Kazakhstan State Technical University, Ust-Kamenogorsk, Kazakhstan
ktm60@rambler.ru

ABSTRACT

Mathematical model of hydro-pneumatic accumulator of compressing air operation is proposed and discussed.