

**NANOTECHNOLOGY IN AGRICULTURE
(REVIEW)**

N.Voropaeva¹, O.Figovsky , D. Beilin²

*¹All-Russian Rapeseed Research Institute Lipetsk, Russia , ² Polymate Ltd- International
Nanonetchology Research Center, Migdal- HaEmek, Israel
bionanotex_1@mail.ru; Figovsky@gmail.com*

ABSTRACT

The article is concern with biologically active nanochips for treating seeds of agricultural plants in order to improve seed germination conditions and development of plants and for protecting plants from anticipated and averaged adverse conditions. The biologically active nanochips contain a solid porous carrier, such as mineral, clay, turf, or polymer, the pores of which are intended for accommodating nanoparticles of biologically active substances that penetrate the pores when the substances are applied onto the nanochip surface, e.g., by spraying. Alternatively, the biologically active substances can be retained on the surface of the carrier by adhesion. The composition of the biologically active nanochips is selected with reference to anticipated and averaged adverse conditions. Also proposed is a method for application of the biologically active substances onto the surfaces of the biologically active nanochips. The article offers a brief review of the published works of authors and their employees.

LOW-CEMENT CONCRETE WITH ASH-MICROSILICA FILLER

L. Dvorkin

National University of Water Management and Nature Resources Use, Rivne, Ukraine.
dvorkin.leonid@gmail.com

ABSTRACT

In present paper the possibility of obtaining ash - microsilica filler (AMSF) and its application as an additive in low-cement concrete is experimentally substantiated. The parameters which characterize the surface energy and pozzolanic activity of AMSF depending on the characteristics of initial materials and their ratios were investigated. Performed X-ray diffraction studies show an accelerating effect of AMSF on the hydration of clinker minerals. The influence of AMSF in the composition with the addition of superplasticizer on water demand and concrete mixes workability was researched. Based on the data obtained with the applying the methodology of mathematical experiments planning, the statistical models of strength of normal hardening concrete and steamed concrete were obtained, depending on the factors which characterize the structure and composition of the concrete with AMSF additive. Analysis of the model allowed determining the area of optimal compositions of low-cement concrete with the AMSF additive. The features of the concrete strength growth, impact of AMSF on frost resistance and deformation properties were studied

**LITHIUM IN NATURE, APPLICATION, METHODS OF EXTRACTION
(REVIEW)**

P. Kudryavtsev

Holon Institute of Technology, Holon, Israel
pgkudr89@gmail.com

ABSTRACT

The present review is dedicated to the world's lithium resources, and application areas of lithium and its compounds in everyday life and technology. Lithium is the lightest representative in the group of alkali metals. In its geochemical properties lithium refers to a group of lithophilic elements. Lithium is found in more than 150 minerals, although only 28 lithium minerals per se are known. Many of them are extremely rare. The main lithium minerals are the following: amblygonite, lepidolite, petalite, spodumene, zinnwaldite and Jadar. A review of the world's largest lithium deposits, made the analysis of its global production and reserves. Deposits of lithium are known in Chile, Salar de Uyuni in Bolivia, United States, Argentina, Congo, Lake Chabyer in China, Brazil, Serbia, and Australia. The estimates of reserves were made on the basis of information received from government and industry sources. Separately was presented analysis of the resources and reserves of lithium in the associated petroleum waters of Russia. It also shows that a large source of lithium is the Dead Sea in Israel. Due to the market development of lithium power sources, the most promising lithium resource is secondary resources. The necessity of creation of processes for recycling of spent lithium power sources. In connection with rapid growth in lithium consumption, it is very urgent task of lithium extracting, and receive it in the form of salts, and metal. Have been described, modern sorption methods of lithium extraction from poor on the composition of natural waters and brines with the use of inorganic ion exchangers highly selective to lithium. We present the results of their tests on real natural brines. Particular attention is given to the review of the lithium and its compounds application areas. The most important and rapidly growing area is lithium power sources. Next in importance and volume of consumption lithium is glass and ceramics. Also, large application areas of lithium are lubricants, regeneration of oxygen in the autonomous life support systems, production of polymeric materials and catalysts in chemical technology, metallurgy, pharmaceuticals, medicine. In recent years, a number of promising new application areas of lithium and its compounds: hydrogen energy, electronics and nonlinear optics, nuclear power, and used as rocket fuel. At the end of the article, it provided an overview of prices and demand for lithium and its compounds

**NEW COMPOSITE FLOCCULANTS - COAGULANTS
AS AN ALTERNATIVE TO THE KNOWN WATER TREATMENT AGENTS**

P.G. Kudryavtsev¹, N.P.Kudryavtsev²

¹ *Holon Institute of Technology, Holon, Israel*, ² *Polymate Ltd - Israel Nanotechnology Research Center, Migdal HaEmek, Israel*

ABSTRACT

The present work relates to the technology of inorganic substances and can be used in the preparation of aluminum-silicon and ferrum-silicon flocculants-coagulants and to the methods of treatment of

sewage of industrial enterprises and storm water containing oil. In this article the questions of water treatment using modified aluminum-silicon and ferrum-silicon flocculants-coagulants, resulting in new technology. The authors have developed and patented the technology for producing flocculants-coagulants of this type in solid form using methods of matrix isolation of existing active components. Evaluate the effectiveness of the action of ASFC and FSFC on simulated and real industrial wastewater, in comparison with the known analogues.

ABOUT VELOCITY SHOOTING BY INTEGRATED GEOPHYSICAL METHODS AND CORRECTIONS ON LOW VELOCITY LAYER (LVL)

E. Shahbazov, U. Mammadova

SOCAR, Baku, Azerbaijan
eldar@socar.az

ABSTRACT

The article deals with the possibility of determining the average speed and the introduction of amendments for the area of small speeds, through the use of data by electrical overcurrent. The comparative example of the calculation of average speeds suggests that a comprehensive approach to solving the problem with the use of electrical data, where the conditions of seismic and subsurface do not yield unambiguously interpreted seismic materials

METHODS OF ASSESSING SAFE ENVIRONMENT EMERGENCY RESPONSE AFTER THE AIR-GAS EXPLOSIONS

A. Chernay¹, V. Sobolev¹, N. Nalisko²

¹ *State Higher Education Institution «National Mining University», Dnepropetrovsk, Ukraine,*

² *State Higher Education Institution «Prydniprov's'ka State Academy of Civil Engineering and Architecture» Dnepropetrovsk, Ukraine*

valeriysobolev@rambler.ru

ABSTRACTS

The experimental test method of numerical calculation of the blast wave pulse transmitted by explosion protection construction. In a laboratory experiment used a laser technique initiation of explosives and methods of measurement of the pressure pulse detonation products on the ballistic pendulum. To determine the mechanical momentum of the technique of the experiment in which the analytically derived functional relation between the momentum and the angle of deflection, and the performance of the real pendulum. The reliability of the results obtained in physical experiment is provided by the calibration sensor deflection angle of the pendulum, pulse evaluation of measurement errors associated with the determination error of the deflection angle, friction pendulum axis and increments the read information.

FEATURES OF PLANT BIOMASS AFFECTING THE ENZYMATIC DIGESTIBILITY

M. Ioelovich

Designer Energy Ltd, Rehovot, Israel
bd895892@zahav.net.il

ABSTRACT

Enzymatic hydrolysis of a large number of not-treated and pretreated plant materials of various origins containing different amounts of cellulose, hemicelluloses and lignin has been studied. To disclose the effect of chemical composition and structural characteristics on yield of glucose, a correlation analysis was performed and squared correlation coefficients (R^2) were calculated. This analysis showed that hemicelluloses have a negligible impact on enzymatic digestion of the cellulosic component. Content of lignin affected negatively on enzymatic cleavage of cellulose, and namely an inversely proportional regression between content of lignin in the samples and yield of glucose was observed ($R^2 = 0.67$). Conversely, increased cellulose content in the biomass affects positively on enzymatic digestion and glucose output ($R^2 = 0.84$). To improve the correlation, an effect of crystallinity degree of cellulose on hydrolysability should be taken into consideration. As a result, the best correlation with maximum squared coefficient ($R^2 = 0.98$) was found for the dependence of glucose yield (Y) on the combined parameter Z, which includes the content and crystallinity of cellulose, as well as the content of lignin in the investigated biomass samples. As follows from the regression equation $Y=f(Z)$, an increase the content of cellulose, reducing of its crystallinity and decreasing of the lignin content in the samples promotes enzymatic cleavage of the cellulosic component. The discovered correlation $Y=f(Z)$ permits prediction the saccharification degree of pretreated biomass and can be used for choice the best pretreatment method. In particular, the nitric acid/alkaline pretreatment of herbaceous plants provides obtaining the delignified biomass enriched with low-crystalline cellulose that shows an excellent enzymatic digestibility.