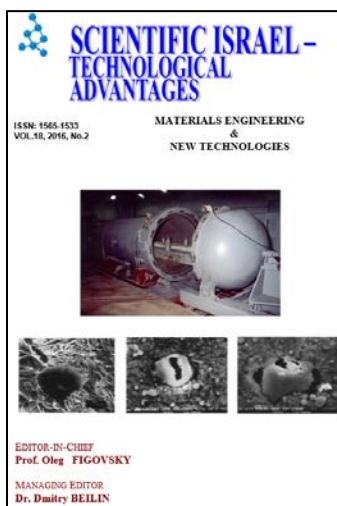




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Том 18, №2

АННОТАЦИИ НЕКОТОРЫХ СТАТЕЙ:

B.V. Gusev : Nanostructuring of Concrete Materials

The article presents nanostructuring of cement systems due to introduction of ultra- and nanodispersed mineral additives. In this process, additional grinding of mineral additives is made in cavitation installations during preparation of concrete mixtures. Nanostructuring provides compaction of concrete structures and increase of strength parameters 1,5 – 2 times.

M. Ioelovich: Physicochemical Methods for Determination of Cellulose Crystallinity

Two physicochemical methods for determination of crystallinity degree of cellulose have been developed. The first method was to study the sorption of water vapor (A), and second was to measure the enthalpy of wetting (ΔH). These methods are based on mechanism of interaction between cellulose and molecules of water, which is carried out in the amorphous domains of the polymer. Thus, increase in content of amorphous domains and decrease in degree of crystallinity leads to rise of water sorption and enthalpy of wetting. As a result, an equation for calculation of the crystallinity degree (X) of cellulose was proposed: $X=1- (Z/Z_0)$, where Z is a physicochemical parameter (A or ΔH) of the sample, and Z_0 is a theoretical

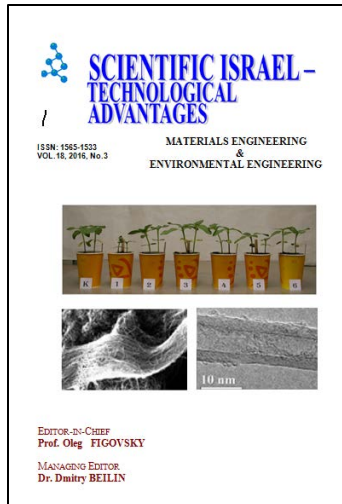
parameter calculated for amorphous cellulose. Both physicochemical methods give similar values of crystallinity degree. For example, crystallinity degree of MCC samples was 0.72 to 0.75. It was shown that the independent physicochemical methods for determination of cellulose crystallinity are free of shortcomings inherent to physical methods such as XRD and NMR; therefore the proposed method can be used to determine the actual degree of crystallinity of cellulose samples.

O. Figovsky, **Environmental Friendly Method of Production of Nanocomposites**
D. Beilin, **and Nanomembranes**
S. Usherenko,
P. Kudryavtsev:

New “green” technology is based on using an unusual physical phenomenon –superdeep penetration (SDP). Synthesis of a skeleton and formation of nanostructure is realized in metals, polymers and ceramics. Physical anomalies at the impact, which appearing in conditions when relative depth of a crater exceeds 10 determining sizes of striker are considered . The influence of the pulse mode on metals and alloys provides reorganization of a material on sub-, micro- and macrolevels. Fibers of ultradisperse structure are formed. Interaction of chemical elements in the field of high pressure produces the metastable connections in large quantities and change of physical and chemical characteristics of the initial materials. Massive composite material from technical aluminum reinforced by fiber zones with reconstructed structure and anisotropy of electro conduction in mutually perpendicular directions in 2 times was obtained. Superdeep penetration is used for manufacturing of special composite metal materials with an unusual complex of properties. Products of interaction for example, carbon and silicon are saved in volume of preform and don’t organize harmful waste at manufacture. The new SDP method of polymer tracking membranes production was developed.. The method for manufacturing track membranes by piercing a matrix of a thin-film material with a flow of hard particles generated by an electric field is proposed as well.

S.A.Kolodyazhniy, **Prospects and Implications of Structural Insulated Panels in Low-Rise**
R.A. Sheps, **Construction**
T.V. Shchukina

The research of pilot house at the site of the Voronezh State Architecture and Construction University confirmed the high insulating properties of structural insulated panels (SIP). The results allow recommending these constructions for use in the northern regions. The possible consequences of long-term operation of buildings, erected by the SIP technology, were considered. Presented data includes measurements of harmful substances released into indoor air spaces. Obtained dependencies allow predicting the aging of polystyrene, which is filled in the frame and panel construction.



Том 18, №3

Аннотации некоторых статей

N.Voropaeva, **Nanotechnology in Agriculture (Review**
O.Figovsky ,
D. Beilin:)

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.

L. Dvorkin : **Low-Cement Concrete with Ash-Microsilica Filler**

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.

P.G. Kudryavtsev, **New Composite Flocculants – Coagulants as an Alternative to the Known**
N.P.Kudryavtsev **Water Treatment Agents**

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.

A. Chernay, **Methods of Assessing Safe Environment Emergency Response**
V. Sobolev, **after the Air-Gas Explosions**
N. Nalisko

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.

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