## ABSTRACTS OF PAPERS PUBLISHED IN ISSUE

**Lukin E.S, Popova N.A., Pavlyukova L.T., Kulikov N.A. The most important regularities in technology of technical ceramics**

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The most important regularities of the technology of ceramic materials established on the basis of numerous studies are given. These regularities manifest themselves at various stages of the technological process of manufacturing ceramics and include: the phenomena of inheritance of the structure of the previous phase, the features of crystal growth in high-temperature heating, primarily in sintering, the dependence of the growth of crystals on the changes in the parameters of the crystal lattice in the formation of solid solutions, especially the sintering of transparent ceramics , when the processes of removal of porosity and crystal growth are separated. All these regularities are interrelated and completely determined by the structure, dispersion, water and composition of the powders of the starting material.

***Keywords:*** nanopowder, dispersity, crystal growth, lattice parameters, sintering, microstructure, transparent ceramics.

**Anikanova T.V., Rakhimbayev Sh. M., Pogromsky A.S. Comparative efficacy of cellular concrete different composition and perspectives of their application**

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The paper provides a comparative analysis of the main characteristics of foam concrete of normal hardening and aerated concrete of autoclave hardening. It is shown that foam concrete is superior to aerated concrete not only in economic terms, but also in operational.

***Keywords:*** foam concrete, aerated concrete, brand strength, durability, weather resistance.

**Pshenichny G.N., Charikov G.Yu., Arutyunov E.A. On the additive to cement concretes - calcium chloride**

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Abstract: Intermediate experimental results are presented on the refinement of the efficiency of use in the technology of concrete and reinforced concrete hardening accelerator - calcium chloride. One-percent introduction of the additive makes it possible to reduce the initial periods of hardening of concrete in 1,6 ... 1,8 times, increase the turnover of the molds (rigging) and the productivity of the technological process, along with increasing the operational reliability of the final product.

***Keywords:*** portland cement, concrete, calcium chloride, hardening acceleration, reinforcement corrosion, dump strength, concrete reliability

**Molchan N. V., Krivoborodov Yu. R., Fertikov V. I. Intermolecular interactions in two-component oxide systems with $SiO_2$.**

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Calculations of intermolecular interactions in two-component oxide systems with SiO2 based on the normalized value of the change in the volumes of the reacted components are presented. Calculations were made on the basis of reference data of the densities of substances. Structural characteristics of substances are presented.

***Keywords*:** concentration of electrons, density, oxides, structure.

**Guvalov A.A., Abbasova S.I., Kouznetsova T.V. Application of natural zeolite in oil-well cement composition**

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The results of testing cement-zeolitic oil-well solutions obtained on the basis of zeolite-bearing rocks of the Aydagh deposit on the basis of clinoptilolite are presented. It is shown that the main advantage of the introduction of clinoptilolite-containing zeolite in the grouting mortar, in comparison with other pozzolans, is not their ability to rapidly setting lime, but to create an increased diffusion activity of the reaction components. It was found that after two years of hardening at a temperature of 750 ° C, the modified cement-zeolite oil-well solution had a strength approximately 2 times greater than the cement-clay composition of the same specific gravity (1.5 g / $cm^3$). Acceleration of the hydrate formation process by the use of zeolite and the improvement of its phase composition make it possible to justify the use of production columns for grouting at temperatures of 20 to 1000ºC instead of cement-sandy mixes, relatively heavy and slowly hardening.

***Keywords*:** oil-well cement, mineral additives, zeolite, clinoptilolite, cement stone, strength, slurry.

**Samchenko S.V., Hohlov D.S., Markov N.D. Increase in activity of sols and cements by activation in an aqueous medium**

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The joint activation of the ashes with cement ensures a higher homogenization of the mixture, which results in significant cost savings, because does not require additional equipment for separate activation of materials. Besides, the joint activation of cement and ash significantly increases the strength of samples from cement stone and concrete. Thus, cement stone, obtained on the basis of jointly activated ash and cement, has an increased early strength due to increased pozzolanic activity of ashes and intensive hydration of clinker minerals, and late - due to the active participation of ash in the formation of the structure of cement stone. The obtained results make it possible to use ash and slag wastes more efficiently when obtaining cements and concretes on their basis.

***Keywords*:** ash-cement mixtures, pozzolanic activity, hydration, joint activation