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Article 1

Musafirova G. Ya., Grushevskaya E. N., Musafirov E. V., Popova M. N.
Modification of cement binder by the dispersed additive of secondary polyamide
Musafirova G. Ya. (musafirova_gy@grsu.by), Candidate of Technical Sciences, *Grushevskaya E. N.*, Master of Technical Sciences, *Musafirov E. V.*, Candidate of Physico-Mathematical Sciences, Yanka Kupala State University of Grodno, Belarus; *Popova M. N.*, Doctor of Chemical Sciences, prof., Moscow State University of Civil Engineering

Key words: cement binder, secondary polyamide, cement-polymer material, superplasticizer

Abstract

Physical-mechanical, hydrophysical and tribotechnical characteristics of cement binder modified by the dispersed additive of secondary polyamide are investigated. The optimum composition of the cement-polyamide binder is developed. It was found that when the content in cement-polyamide samples 2,5% of the polymer, the bending strength increases by 34%, the water absorption of samples decreases on average by 28%, the frictional resistance increases more than 3 times. Improving the strength characteristics of cement-polyamide samples is caused by dispersible reinforcing of a mineral matrix due to the activation of adsorption-capable connections of polyamide with a mineral matrix of cement in an alkaline condition at a temperature of 80–85 °C. The average density of cement-polyamide samples slightly decreases with the increase of polymer content in cement-polyamide samples since the true density of polyamide is 3 times less than cement. The obtained cement-polyamide compositions will allow to reduce material consumption, to increase a load-bearing capacity and crack resistance of building constructions working on a bend, to increase wear resistance of coatings, to expand a raw-material base of the construction industry and to improve an environmental situation.

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Article 2

Medvedev E. F., Melkonyan R. G.
Structure determine criteria of oxide glasses
Medvedev E. F. (mef58@yandex.ru), Doctor of Technical Sciences, Russian Federal Nuclear Centre – All-Russian Scientific Research Institute of Experimental Physics, Sarov, Nizhniy Novgorod region;

Melkonyan R. G., Doctor of Technical Sciences, prof., National University of Science and Technology «MIS&S», Moscow

Key words: glass, gas permeation, hydrogen, structure, criteria

Abstract

The scientifically justified principals of developing criteria to predict structure and gas permeation of glasses in silicate, borate and borate-silicate systems are represented. These glasses are used to produce of hydrogen filled microspheres.

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Article 3

Korogodskaya A. N.
Features of the hydration processes of cements on the base of aluminates and chromites alkaline earth elements
*Korogodskaya A. N. (*korogodskaya@yandex.ru), Candidate of Technical Sciences, National Technical University «Kharkiv Polytechnic Institute», Ukraine

Key words: alkaline earths aluminates, alkaline earths chromites, hydration, hardening products, complex physical and chemical methods of analysis, aluminum and chromium hydroxides

Abstract

The results of the physical and chemical studies of the hydration processes of special cements on the aluminates and chromites of alkaline earth elements are presented. The sequence of basic hydrated phases formation in special cements is substantiated. The regularities of cement stone solid structure formation are concluded.

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Article 4

Rakhimova N. R., Rakhimov R. Z.

Properties and porous structure of the cement compounds based on the blended alkali-activated cements mixed with nitrate solutions

Rakhimova N. R. (rahimova.07@list.ru), Doctor of Technical Sciences, prof., *Rakhimov R. Z.*, Doctor of Technical Sciences, prof., Kazan State University of Architecture and Engineering

Key words: immobilization of radioactive waste, alkali-activated cements, liquid radioactive waste, mineral additives

Abstract

The studies of the stability of a long stay in the water, shrinkage deformation, macroporous structure of hardened cement pastes based on alkali-activated slag and blended with metakaolin alkali-activated slag cements mixed with nitrate salt solution of high concentration (700 g/l) are presented.

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Article 5

Logvinkov S. M., Shumeyko V. N., Shabanova G. N., Tsapko N. S., Ivashura A. A., Kobzin V. G., Borisenko O. N.

Resource-saving technology of waterproofing composition for concrete constructions and buildings

Logvinkov S. M. (smlogvinkov@yandex.ru), Doctor of Technical Sciences, prof., Simon Kuznets Kharkiv National University of Economics (KhNEU named S. Kuznetsa), Ukraine, *Shumeyko V. N.,* Research Assistant, *Shabanova G. N.,* Doctor of Technical Sciences, prof., National Technical University «Kharkiv Polytechnical Institute», Ukraine, *Tsapko N. S.,* Candidate of Technical Sciences, *Ivashura A. A.,* Candidate of Agricultural Sciences, *Kobzin V. G.,* Candidate of Technical Sciences, *Borisenko O. N.,* Candidate of Technical Sciences, KhNEU named S. Kuznetsa, Ukraine

Key words: building materials, waterproofing composition, quartz-containing waste, concrete waterproofing, performance, rational technology

Abstract

Composition for waterproofing of concrete structures that contains industrial waste has been developed. The use of this composition allows to solve a set of environmental and resource saving problems and to increase technical and economical production indicators. Test results have been presented, along with comparative analysis of advantages and disadvantages of waterproofing coatings of different compositions and grades. Application efficiency of developed waterproofing composition compared to foreign analogs has been established.

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