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**IMPROVING TECHNOLOGICAL CEMENT QUALITY PARAMETERS**

**Deineka Viktoriia,**

Associate professor, Candidate of technical science

**Pietukhov Ruslan**

Cadet

National University of Civil Protection of Ukraine

Kharkiv, Ukraine

Е-mail: wolf198021@gmail.com

**Аnnotation:** Based on the compounds of the four –component CaO – BaO – Fe2O3 – SiO2 system, we developed for this purpose the technology for the production of special corrosion-resistant cements of a polyfunctional type that can be used for the production of extra strong radiation-protective and corrosion –resistant plugging cements. Calcium-barium ferrosilicate cement hydration processes were investigated and it was established that the main hydration products are barium hydrosilicates and calcium and barium hydroferrites of a different basicity that provide high strength characteristics for the cement stone.

**Key words**: radioactive waste, geological repositories, environmentally safe disposal, solid-phase synthesis, hydration processes and radiation-protection properties.

A key principle of the handling of radioactive waste anticipates a high safety level [1, 22 р]. To realize this principle and increase the operation efficiency of such substances the radioactive waste is clearly classified by the radiation category and the half-decay period. Radioactive materials are attributed to a special group. All the processes that are related to the production, use, recycling and disposal of radioactive materials are controlled by the International Nuclear Power Engineering Agency that is also responsible for the international standardization of the rules [2, 29 p.].. One of the ways to the solution of this problem is to coat the walls of depositories with the hermetically sealed material characterized by high radiation-resistant and corrosion-resistant properties.

The objective of this research was to develop radiation -resistant and corrosion -resistant binding materials for the coating of the walls of underground depositories intended for very-long-term radioactive waste storage.

The technical properties of developed materials were investigated using the standard techniques that are designed for the studies of binding materials.

A set of the contemporary methods of analysis of multicomponent systems that includes thermodynamic, physical-&-chemical and mathematical methods was suggested to study the four -component CaO – BaO – Fe2O3 – SiO2 system.

New compositions for corrosion-resistant concretes with a high γ-radiation protection level were developed using artificially synthesized (barium monosilicate) and natural (barite, serpentinite) fillers. Physical and physical-&-mechanical characteristics of the concretes of a special purpose were defined, in particular the compression strength after 28 days of hardening was in the range of 44.5 to 58.4 MPa; the porosity was 17 to 18,6 %; the volumetric weight was 2820 to 4680 kg/m3,the γ-radiation transmission coefficient was 0,46 to 0,52, the softening degree in the temperature interval of 0 to 1200 °С was 15 to 19 %. These parameters allow us to use the developed compositions as protective coatings for the underground depositories intended for a very-long-term disposal of radioactive waste.

**Bibliography**

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