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REFRACTORY CONCRETES USING INDUSTRIAL WASTE

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Анотація. В результаті проведених досліджень отримано композиційний вогнетривкий матеріал з використанням відходів промисловості. Випробування зразків підтвердили стійкість виробів до температури 800 ° С без суттєвої втрати механічних властивостей.

To reduce the cost of construction products and reduce the consumption of natural raw materials, fuel and energy and other resources, in recent years, industrial waste has been very actively used, which is economically feasible [1].

Improving the physical and mechanical properties and special properties of concrete can be solved by using effective technological methods, complex active chemical mineral additives [2]. Natural mineral additives require additional costs for their production, which is economically impractical.

In the works [2-3], the authors proved that using industrial waste from thermal power plants and chemical industry enterprises in Ukraine, it is possible to obtain effective special-purpose construction products. It should be taken into account that 12 thermal power plants operate in Ukraine, which annually send about 10 million tons of ash and slag waste to landfills, and the specific weight of their use in the technology of building materials is 5–8 times less than in foreign countries [4].

One of the promising directions for obtaining special refractory concretes is a composite material obtained on the basis of phosphogypsum waste. The use of a complex technology of physicochemical activation of such industrial wastes as phosphogypsum, fly ash, a new type of fire-retardant building materials was obtained [5-6]. As a result of artificial synthesis of physicochemical processes of structure formation of metal ash phosphate binder, dispersed-filled structures with a low content of free liquid phase were obtained [7-9].

As a result of the conducted research of technological parameters, fire-resistant concrete samples were manufactured, the compressive strength of the samples varies from 5.8 to 14.6 MPa, the average density of the material, respectively, is 680 - 1250 kg/m³. Tests of the resistance of products to temperature effects showed that when heating the samples to 800 ° C, mass losses are up to 13%.

Conclusion. As a result of using a comprehensive technology for activating industrial waste, a fire-resistant metal ash phosphate binder was obtained.

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