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HEAT-RESISTANT COATINGS BASED ON INDUSTRIAL WASTE

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Анотація. В результаті проведених досліджень, встановлено, застосування комплексної технології фізико-хімічної активації промислових відходів, а саме фосфогіпсу, золи-винос і металевого шламу отримано новий різновид вогнестійких будівельних матеріалів. Такий матеріал може бути використаний для виготовлення вогнестійких покриттів будівельних конструкцій.

Among the existing methods of protecting load-bearing elements of buildings from the effects of high temperatures, the most common method is shielding the surfaces of structures with protective coatings. Composite materials with a porous structure, obtained on the basis of traditional mineral binders, have become widely used as passive fire protection coatings [1-2].

Special finishing coatings made of porous concrete mixtures are becoming widely used for shielding high-temperature fields due to the multifunctional properties inherent in such artificial conglomerates. Mineral binders based on Portland cements are traditionally used for the manufacture of building products with a porous structure. It is known that the stability of the structure of cement stone is ensured when it is heated to 600°C [3], a further increase in temperature is accompanied by structural changes in water-containing compounds of clinker minerals and causes intensive cracking of building products and subsequent destruction of the structure [4-6].

The use of a complex technology of physicochemical activation of such industrial wastes as phosphogypsum, fly ash and metal sludge has made it possible to obtain a new type of fire-retardant building materials. As a result of artificial synthesis of physicochemical processes of structure formation of metal phosphate bonds and the use of fly ash as a filler, dispersed-filled structures with a low content of free liquid phase were obtained [7-8].

The resulting composite material is a new type of special concrete and can be used for the manufacture of fire-retardant coatings for metal structures. Tests of the resistance of products to temperature influences showed that when heating samples to 700 °C, the mass loss was 10.2%.

To establish the predicted operational characteristics of the material, it is planned to conduct studies of the relationship between the technological parameters of raw material mixtures and the indicators of the macro- and microstructure of products.

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