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SELECTION OF INITIAL CHARGE MATERIALS FOR MUD PROTECTION STRUCTURES

Abstract. In this article we consider the selection of initial charge materials for structures of mud protection structures. To study the development of the optimal content of the composite material used to erect a protective structure, it is necessary to determine their physicochemical properties of the starting charge materials. As initial charge materials in the form of fillers, the use of Karaganda steel melting slag waste from Arcelor Mittal Temirtau JSC plant, granulated electrothermophosphor slag of Novo Zhambul Phosphor Plant, and mineral wool as micro-reinforcement are proposed.The waste of slate-pipe production and Portland cement of M300 grade are used as binders.X-ray phase analysis of samples of electrothermophosphor slag and steel-smelting slag was carried out on a DRON-3 instrument in the angular interval 8-640.

Key words: Electrothermophosphor slag, steel-smelting slag, composite material, mud protection structures.

Introduction. In modern conditions, when the activation of dangerous geological processes is influenced by human economic activity as well as natural factors, the problem of implementing effective protective measures and structures with the current degree of development of mountainous and foothill areas acquires a mass significance for the state.Dangerous geological and natural processes determine the conditions for economic development of the areas, as intensive development causes serious difficulties for the construction and operation of various structures; therefore, it requires taking preventive protective measures.

The development of a general line in the implementation of engineering protective measures and facilities without an analysis of the current conditions of the protection systems is impossible [1].

The bulk of the constructed facilities on the territory of the Republic of Kazakhstan played a positive role in reducing damage during the passage of debris flows and is ready to fulfill its functions in the future.

A number of facilities have been destroyed as a result of extreme situations of natural disasters, such as mudflows, avalanches, landslides which can be an example of the inefficient design solutions. Part of it fell into disrepair due to inadequate ongoing and major repairs during operation.The imperfection of protective structures and the fragility of their functioning is largely determined by the lack of the necessary regulatory framework for their design, construction and operation.

Methods of research. To study the development of the optimal content of the composite material used to erect a protective structure, it is necessary to determine their physicochemical properties of the starting charge materials.As initial charge materials in the form of fillers, the use of Karaganda steel melting slag waste from Arcelor Mittal Temirtau JSC plant, granulated electrothermophosphor slag of Novo Zhambul Phosphor Plant, and mineral wool as micro-reinforcement are proposed.The waste of slate-pipe production and Portland cement of M300 grade are used as binders.

Chemical content of Portland cement in% of mass:Al_2O_3 – 4.00, Fe_2O_3 – 4.04 CaO -65.70, MgO – 1.93. SO_3 -2.5, SiO_2-21.50. Chemical composition of mineral wool wastes, in% by weight:Al_2O_3 – 9.7, Fe_2O_3 -1.6, CaO – 39.0, MgO – 2.2, SO_3-0.9, SiO_2-45.80.Chemical composition of waste of slate-pipe production, in% of mass:Al_2O_3 -3.85, Fe_2O_3-4.145, CaO -50.0, MgO – 53.5, SO_3-1.65, SiO_2-20.80.