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Research the Composition of Finishing Mixtures

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Abstract:
The article presents the developed compositions and properties of cosmetic mixtures based on slag-alkaline binders.

Keywords: Binder, mixture, filler, model, analysis, strength, chemical additive, density.

INTRODUCTION:

The use of new types of environmentally friendly materials in the construction industry, the effective use of energy, and resource-saving technologies are growing in the world. In developed countries, including the United States, Germany, Japan, China, Russia, the widespread use of waste and by-products of the fuel and energy, chemical, and metallurgical industries in the creation and production of new building materials is becoming increasingly important. In this regard, special attention is paid to the determination of their composition and properties, including the creation of new types of binders based on industrial waste and local raw materials and energy-saving technologies for the production of decorative materials based on them. One of the most pressing issues is the widespread use of slag-alkaline binders in construction, waste-free technological processes, common products of other industries, and the widespread use of local raw materials. This saves a significant amount of Portland cement, which is in short supply and allows the replacement of aggregates with local soft materials [1].

Based on the second-order of the rotatable method, which is a mathematical method of planning experiments, [2,3] the composition of modified annealed binders was optimized and the effect of the number of components included on the bond strength was determined, and mathematical models were developed for these components. In this case, the physical and mechanical properties of the binder, including its strength, were selected.

MATERIAL AND METHODS: The main requirement for optimizing the composition of binders obtained without modified firing is to minimize the consumption of Portland cement clinker and achieve the required compressive strength [4, 5]. As optimization parameters, the mechanical strength of the binders was obtained after 28 days of solidification under normal conditions and heat-moisture treatment (Table 1).

Table 1: Range of change of sizes

Coding condition	The natural value of the variable		
	X_1	X_2	X_3
Experiment center	15	20	60
Change interval	5	10	30
High level	20	30	90

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Low level	10	10	30

After mathematical processing of the results obtained by planning the experiments, a regression equation (mathematical model) depending on the strength of the binders given the heat-moisture treatment was developed:

$$Y = 281{,}72 + 44{,}24x_1 + 17{,}03x_2 + 52{,}27x_3 - 3{,}18x_1x_2 + 22{,}15x_1x_3 + \\ +17{,}62x_2x_3 + 41{,}42x_1^2 + 84{,}35x_2^2 - 1{,}66x_3^2 \quad (1)$$

The analysis of the obtained models, i.e. the effect of the multi-component binder composition on its strength, shows that all of the above factors, i.e., the solidification conditions and the type of solution introduced, are directly related. **RESULTS:** To determine the optimal composition of cosmetic mixtures, the following options were selected depending on the consumable components in the mixture:

1. Electrothermophosphorus rock, copper smelting rock, Portland cement clinker, sand-based on marble waste, solution of sodium disilicate with density r = 1.3 g /cm^3.
2. Electrothermophosphorus rock, copper smelting rock, Portland cement clinker, sand-based on marble waste, solution of sodium disilicate with density r = 1.3 g / cm3 - superplasticizer "FREM C-3".

The optimal composition of cosmetic mixtures was developed by the computational-experimental method, based on the data of the mathematical method of planning experiments, samples were prepared from cosmetic mixtures under experimental conditions, modified binders of mineral additives and surfactants and physicomechanical properties of solid samples of cosmetic mixtures. (1- figure)

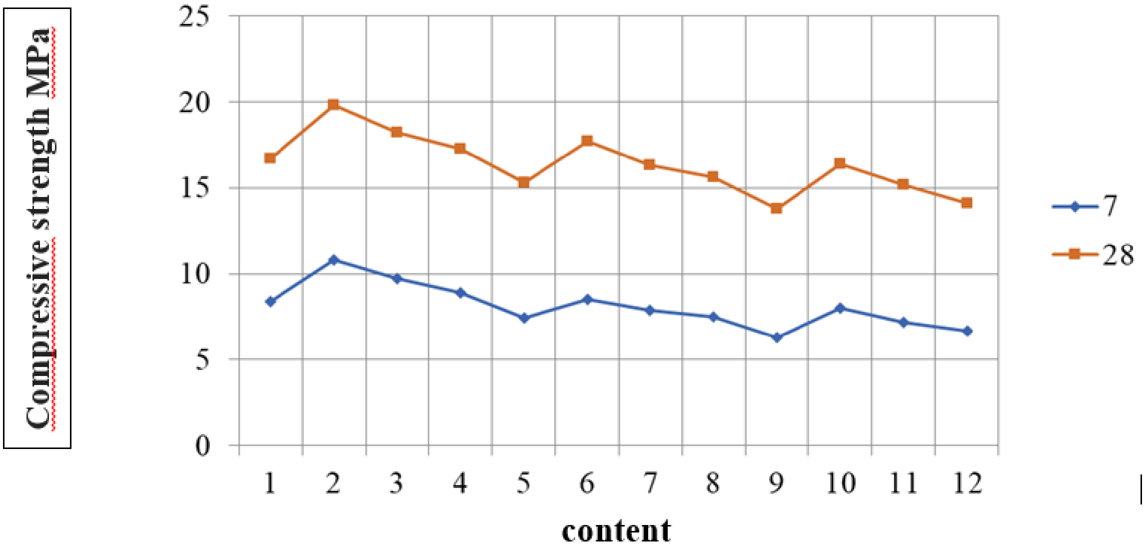

Figure 1. Strength characteristics of the optimal composition of the decorative mixture: 1-12 - for the composition of the mixture based on "ETF and copper melting stone, Portland cement clinker, sand based on marble waste, sodium disilicate solution-superplasticizer"

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DISCUSSION:

Analysis of the results of the experimental tests performed shows that the addition of 30% copper smelting stone to the binder mass in the decorative mixture reduced the strength of the solid mixture relative to the strength of the control samples. For cosmetic mixtures, 30-35% aqueous concentrate of FREM S-3 superplasticizer was added in the amount of 0.5-1.5% relative to the binder mass. The optimal consumption of the additive was determined by experimental work under experimental conditions depending on the composition of the mixture.

The introduction of a superplasticizer in the amount of 0.5% relative to the binder mass did not significantly affect the strength of the mixture. As a result of adding 1.0-1.5% of the binder mass of the chemical additive to the mixture, an increase in strength was observed due to a decrease in the water-cement ratio.

CONCLUSION:

Based on the mathematical method of planning experiments, the composition of binders obtained without modified annealing was optimized and the effect of the amount of components included in it on the strength of the binder was determined, and a mathematical model was developed. The analysis of the obtained results, i.e. the effect of the multicomponent binder composition on its strength, shows that all of the above factors, i.e., the solidification conditions and the type of solution introduced, are directly related.

The main physical and technical properties of the developed cosmetic mixtures were studied. The density of the decorative mixture was 2120-2190 kg / m3, the mobility of the mixture was 12-14 cm, the compressive strength of the samples of optimal composition, which remained for 28 days under normal conditions, was 14.3-19.8 MPa.

REFERENCES:

1. Mirziyoev Sh.M. Five priorities of the Development Action Strategy of the Republic of Uzbekistan for 2017-2021.
2. Tulaganov A.A. Bases of non-fired alkaline binders and concretes. Tutorial. Publisher, 3rd, revision and addition. Tashkent, Navruz, 2015, -234p.
3. Tulaganov A.A. High-strength slag-alkaline expanded clay concrete. Abstract of Candidate of Technical Sciences, Kiev, 1985.
4. Tulaganov AA, mag. Khudoynazarova Q.J., Otakulov B.A., Ismoilov E.D. Application of copper smelting stones in the production of building materials, Collection of articles of the III Republican scientific-practical seminar "Innovative building materials, products and structures", TIACE, Tashkent, December 21, 2019, pages 40-46;
5. GOST 5802-86. Structural solutions. Metnods test. / M: Publishing house of Gosstandart. –Prepublishing. -2010.