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Use Of Copper Smelting Stones in The Production of Filler Mixtures

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Annotation: This article is devoted to the optimization of the use of industrial wastes, chemical and mineral additives in the deposits of fillers in the country, to improve the properties of fillers. mineral cotton, pavement concretes, alloys for filling mountain cavities and other construction materials.

The keywords. Filler, mineral, industrial, waste, non-ferrous, metallurgical stones, copper, smelting, glass, additives, crystals,

Introduction. There is a lot of research in the world on the optimization of the composition of alloys using on-site industrial waste, chemical and mineral additives, the purposeful control of the formation of structures in alloys. In this regard, it is important to study the physical and technical properties of aggregates, to increase the durability, time-carrying and long-term durability of aggregates deposited in mountain cavities.

References. Widespread use of industrial wastes and secondary building materials in the production of building materials, development of effective filler compounds, improvement of physical and technical properties and increase of long-term durability. D, Aldambergenov U.A, Baikonurov O.A, Krupnik L.A and others have made a significant contribution to the solution of these problems. Our scientists have conducted several studies on the development of the composition of building materials based on industrial waste, improving their structure and properties and increasing their efficiency. Kosimov EU, Gaziev UA, Tokhirov MK, Samigov NA, Tulaganov AA, Botvina LM, Turopov MT, Komilov HH

Research methods. The Almalyk Mining and Metallurgical Combine uses flotation technology for the processing of copper ore in the smelting industry. In this case, copper-containing ores are sent to smelters for smelting, and the iron-containing copper smelting industry is formed [1].

Non-ferrous metallurgical rocks are divided into the last and buried to a special depth. The last stones contain a large number of precious metals, which are often the main products of the technological scheme. It is sent to the main technological process or special processing for the extraction of metals from the final rocks.

Rocks buried in special depths contain metal oxides, a small number of precious metals, and the extraction of these metals from the rocks is technologically inefficient [2]. Copper smelting and nickel plating are of great interest in the construction and production of building materials.

Copper smelters are obtained both in the smelting of matte and in the conversion of copper pyrometallurgy. During the melting of matte, two liquid phases that do not mix— copper-enriched matte and turbulence — are formed. Slags containing up to 0.8% by weight of copper are discarded as waste or used as a product because their properties are similar to those of natural basalt (in the crystalline state) or obsidian (in an amorphous state) [3, 4].

Copper smelters are non-ferrous metallurgical wastes, cooled in the air, have a dark colour, do not decompose, are glassy and water content does not exceed 0.6%. The density of copper smelting rocks is 2800 - 3800 kg / m^3, depending on the amount of iron. The absorption capacity of the material is 0.13%. Granulated copper has a higher porosity than air-cooled copper, has a lower texture density and has a very high absorption capacity [5].

Kharchenko EM, Ulyeva GA [6] According to the data, large amounts of copper-containing products accumulate in the rocks. For example, at the Balkhash Mining and Metallurgical Combine (BTMK) 31 mln. More than 250,000 tons of copper were found in the tailings. The BTC does not have its source of raw materials, which is why flotation buried in special pits covers half of the copper production. However, with

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the return of slag to the technological cycle, the issue of their destruction has not been fully resolved, resulting in the need to develop additional technological measures.

When the amount of metals in the rock is small, and their processing is not economically viable, then the rock is used in other areas. According to its physical-mechanical and chemical properties, stones are used in the manufacture of various products. In the cement industry, slag portland cement is used in large quantities as an active mineral additive in the cement industry, and less as a raw material component in the production of cement clinker [7, 8]. An important feature for non-ferrous metallurgical smelters is the presence of small amounts of CaO + MgO (7-13%) and high amounts of FeO (21-61%). In addition to the main components, non-ferrous metallurgical smelters contain small amounts of non-ferrous metals - copper, zinc, lead, nickel and other metals.

In practice, all metallurgical smelters have a glassy phase along with a small or large amount of crystallization products. Bottles buried in special pits and slowly cooling have a small amount of glass, and granular traps contain up to 98%. Glass is a thermodynamically unstable phase, which also determines the chemical activity of the rocks. Slag glass has been shown to interact with mineral crystals with sufficient water relative to mineral crystals [9].

In our research, we used ash-cement compositions to obtain aggregates, which differ from concrete in different physical and mechanical properties (strength, mobility, etc.) and the operating conditions of aggregates. Sand, marble processing waste, fly ash, copper smelting industry waste, Portland cement and superplastic plasticizer in the preparation of aggregates used in underground mining

The article presents the structure of sand and marble-based aggregates based on ash, loose rocks and the results of research [9]

Optimal composition and physicomechanical properties of volatile ash, copper smelting agent and superplasticizer-based alloy

Ingredients t	Portlandcement	Volatilecool	Copper smelting stone	Emptymountainsand	Sandbasedonmarble processingwaste	water	Theamountof "FREM C-3" relative to the mass ofthebinder	Addition mobility, see	Compound density, kg / m ^{3}	Average compressive strength, MPa (after a day) 7	28	60
1	160	40	-	1200	400	242	4,0	11-12	1845	5,28	8,94	10,8
2	128	32	-	1200	400	238	3,2	11-12	1804	3,46	6,18	9,22
3	120	30	-	1200	400	236	3,0	11-12	1793	3,36	5,56	7,44
4	96	24	-	1200	400	230	2,4	11-12	1762	2,38	4,84	6,65
5	80	20	-	1200	400	226	2,0	11-12	1738	2,15	3,42	4,32
6	64	16	-	1200	400	222	1,6	11-12	1719	1,13	1,87	2,47
7	160	-	40	1200	400	238	4,0	11-12	1838	5,16	8,16	10,3
8	128	-	32	1200	400	234	3,2	11-12	1802	3,29	5,86	8,96
9	120	-	30	1200	400	230	3,0	11-12	1782	3,18	5,29	6,45
10	96	-	24	1200	400	228	2,4	11-12	1762	2,16	4,26	6,21
11	80	-	20	1200	400	224	2,0	11-12	1733	1,95	3,17	3,94
12	64	-	16	1200	400	218	1,6	11-12	1710	1,06	1,79	2,38

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Conclusion.

The main disadvantage of the monolithic filling system is that it has a high cost of cement and composting, which contains components in the mixing mixture.Thus, an important aspect of increasing the efficiency of the use of filler alloys and the construction of artificial solidification systems is the development of new types of binding compositions, as well as local raw materials, mining, energy, metallurgical and non-ferrous materials concluded.Analysis of the results of experimental tests shows that the strength of the mixture was reducedrelative to the strength of the control mixture, which added 30% copper smelting powder and volatile ash to the cement mass. For this reason, to ensure the strength of the aggregate, the mineral additives were added to the mixture as the optimal composition was obtained in the amount of 20% of the cement mass. Strength is increased by reducing the water-cement ratio by adding 1.5-3% of the chemical additive to the binder mass.

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