GALAXY INTERNATIONAL INTERDISCIPLINARY RESEARCH JOURNAL (GIIRJ)
ISSN (E): 2347-6915
Vol. 10, Issue 11, Nov. (2022)

COMPOSITION, STRUCTURE AND PHYSICAL - CHEMICAL PROPERTIES OF PHOSPHOGYPSUM

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Phosphogypsum is a grayish powdery mass of various moisture content collected in piles. In the process of processing Karatau phosphorites, it is formed from the conversion to phosphoric acid in the production of phosphorus fertilizers. According to information, the total amount of phosphogypsum accumulated in Uzbekistan is approximately 80 million. tons, of which 45 million in Almalyk chemical plant, 25 million in Samarkand chemical plant, 10 million in Yangikokan chemical plant. is a ton. Currently, the Yangikokan chemical plant is closed. 2,570,000 tons of phosphogypsum in the amount of 1,580,000 tons at the Samarkand chemical plant are dumped into heaps every year. The average chemical composition of phosphogypsum, in %, is as follows: CaO 26; SO3 36; SiO2 15; Al2O3 0.3; Fe2O3 0.2; MgO 0.01; P2 O5 1.2; fluorides 0.1-0.4.

Unlike the igneous apatites of the Kola Peninsula, the Karatau phosphorites are sedimentary rocks and have no naturally occurring radioactive properties.

It is important to solve the problem of using the increasing amount of phosphogypsum piles, taking into account that it is necessary to allocate a large amount of irrigated land for phosphogypsum piles, and a lot of money is spent on their removal and storage. is happening

One of the main conditions for the use of phosphogypsum heaps is to use it in a completely used technological process without residues that do not allow the release of toxic substances. moreover, the effect of phosphorus and fluorine-like elements should not be in practice at all, that is, they should be bound.

Main properties of phosphogypsum

№	Noziklik darajasi, %	Zichlik g/sm	Vaqtini belgilash		Suv sarfi %
			boshlanishi	tugashi	
1	2,5	0,92	6	20	65
2	5	0,86	4,5	18	70
3	7,5	0,77	4	16	70
4	10	0,74	3	14	62
5	12,5	0,72	2	12	70
6	15	0,70	1,5	10	61
7	17,5	0,71	1,5	11	62

Sectors where phosphogypsum can be used:

1. Receiving sulfuric acid and hydraulic additives;
2. Sulfomineral clinker and cement based on it;
3. Adding instead of natural gypsum to control the hardening of Portland cement;
4. In the process of burning Portland cement clinker add as a mineralizer;
5. Obtaining phosphogypsum binders;
6. Getting lightweight concrete.

Obtaining sulfuric acid and hydraulic additives.

Tashkent Institute of Chemical Technology, Institute of General and Inorganic Chemistry of the Federal Republic of Uzbekistan and a number of other scientists created the technology for obtaining sulfate gas and substances based on phosphogypsum and its products; they can be used as a hydraulic additive for cement.

In terms of the amount of oxides SiO2, Al2O3, Fe2O3, tailings formed during saturation production are not inferior to natural soil, and phosphogypsum contains a large amount of calcium sulfate. calculated amount of phosphogypsum, tails and restorers are cooked in tubular steamers for 1 hour at a certain temperature.

CaO SiO2 and 2 CaO SiO2 compounds are formed by combining with SiO2, Al2O3, Fe2O3 oxides of calcium oxides formed as a result of phosphogypsum decomposition. it is possible to capture the sulfate gas released as a result of the decomposition of phosphogypsum and obtain sulfuric acid based on it.

When phosphogypsum is sufficiently decomposed, the amount of calcium sulfate in the additive is 0.1-1.13%, and active CaO is 0.08-3.45%. in which sulfate gas is formed in the amount of 4.5-5%. This additive is not inferior to Shymkent electrothermophosphor slag in terms of activity. Addition of this additive to the composition of cement extends its hardening time.

The product produced as an experiment shows that the addition of the additive increases the strength of portland cement and makes it possible to economize the clinker.

It is considered appropriate to build a dry phosphogypsum production system in order to meet the demand of the republic's cement industry for experimenting at the Almalik or Samarkand chemical plant to use the phosphogypsum being released.

In order to meet the demand for hydraulic additive for the cement industry in Almalyk and Samarkand, it is advisable to build workshops for the production of this additive

The production technology of high-strength gypsum based on phosphogypsum and the production of water-resistant gypsum slag binder based on it is economically favorable. the production technology of gypsum binder based on phosphogypsum was created by Lithuanian scientists, which allows obtaining a binder based on unwashed phosphogypsum with a P2O5 content of 2.5-3%. this technology consists of a new method of neutralization in a calcareous environment, sludge filtration, drying of unbound moisture, dewatering in gypsum cooking pots (taking into account P2O5 in phosphogypsum) and crushing it in a mill. the advantage of this technology is that it does not contain water from washing, does not release toxic gases into the environment, and does not impose special requirements on the purity of phosphogypsum for chemical plants.

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