OPPORTUNITIES TO GET LIGHT SUPPLIES BASED ON COAL WASTE

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ABSTRACT

The article presents data on the production of lightweight aggregates based on local unexpanded clays and industrial wastes.

The granulometric composition of the clay was studied in more complex plasec in the Samarkand and Kashkadarya regions. The optimal composition of clay and coal was determined, the temperature of the shot was determined.

A lightweight aggregate based on the composition given in Table 1 was developed by adding Angren BR coal powder waste as a porous agent to the soil-based composition imported from Pakhtachi district. Granules with a size of 10-20 mm were made from the developed mixtures.

These granules were first dried under natural conditions for 24 hours at an air temperature of 15-300 C and a relative humidity of 45-55% to 8-10% humidity, then in a drying cabinet at a temperature of 100 0 C in a mode of 15-45-15 (i.e., 15 per minute the temperature rises to 100 0 C, the same temperature is maintained at 100 0 C for 45 minutes, cooled to 20-25 0 C for 15 minutes) and the granules are dried until the moisture content remains at 2-3%. The dried granules were then fired at 13,000 C (raising the temperature to 13,000 C for 15 minutes, baking at 13,000 C for 15 minutes and cooling to 5,000 C for 10 minutes) [1].

In the laboratory, its properties were studied in accordance with the requirements of DST [2,3].

Lightweight aggregate based on soil and coal powder.

№	Raw materials, %.			Density of 1 m^3 of mixture in the dry state, kg/sm^3	Burnt granules carving density, kg/sm^3
	Soil	Coal dust	water		
1	70	30	25	739	631
Note: The water content of the mixture is taken from the soil and hazelnuts relative to the total mass of the mixture.					

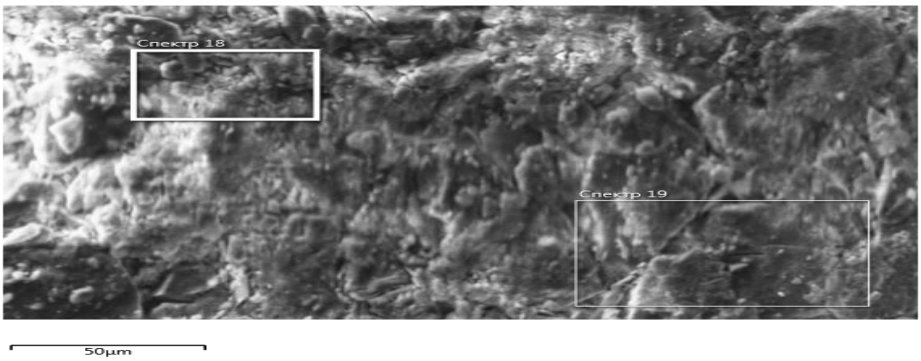

Figure 1. Images of a soil sample taken from the Pakhtachituman Ziyovuddin area under a SEM EVO MA 10 (Carl Zeiss) scanning microscope

Based on the results obtained, we considered the internal changes that occur in the granules during the burning process. Initially, the pre-heat soil composition and soil-coal dust-based light filler granules were examined and analyzed by an electron microscope SEM EVO MA 10 (Carl Zeiss).

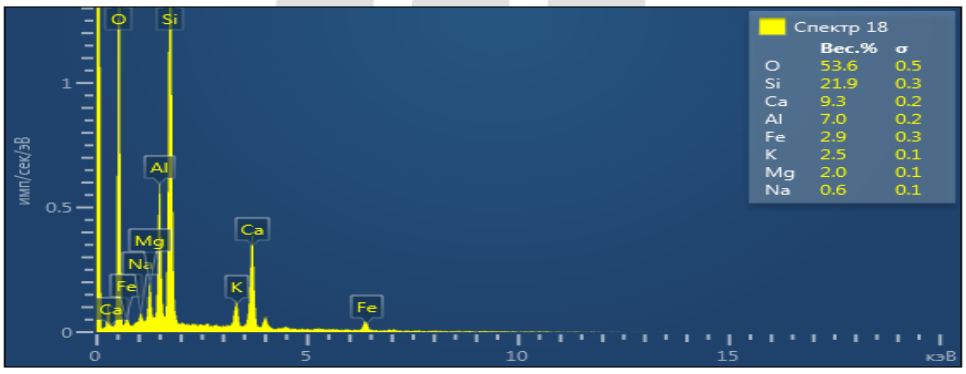

Figure 2. Element analysis from SEM EVO MA 10 (Carl Zeiss) scanning microscope energy dissipation X-ray EDS Aztec Energy Advanced X-Act, Oxford Instruments spectrometer (sample soil from Ziyovuddin area)

The chemical composition of the spectrum at 2 points was determined by enlarging the soil samples to 50 µm (Figure 1). In particular, in the 18-spectrum, the sample contains O-53.6%, Na-0.63%, Mg-2.04%, Al-6.99%, Si-21.95%, K-2.50%, Ca- 9.34% and Fe-2.90%, respectively. Recommendations for sampling of light fillers indicate that the soil content should not exceed Mg-1.8%, Ca-16% and Na + K 5% [4].

The soil we obtained contained 0.24% more Mg, 6.66% less Ca, and 1.87% less (Na + K). The high content of CaO in the soil compared to MgO has a more dangerous effect on the light filler properties obtained from it. Because CaO reacts with water, its volume expands. This results in cracks in the lightweight fillers and a significant reduction in strength.

When we analyze the particles in the soil, we can see from the image in Figure 1 that there is a low particle size of 5-10 µm, which means that the amount of clay particles in the soil is low. The porosity of the surface of the particles is relatively invisible, so the soil is less water-permeable. The lightweight aggregate granules based on soil and coal powder

were then tested in SEM.

Based on the granulometric composition of this soil, it was found that the clay content is 10%, dust -12% and sand-78%. Using the determined granulometric composition, the soil belonging to the “Sandy” class was determined using three-dimensional “Sand-Gil-Chang” coordinates (Figures a and b).

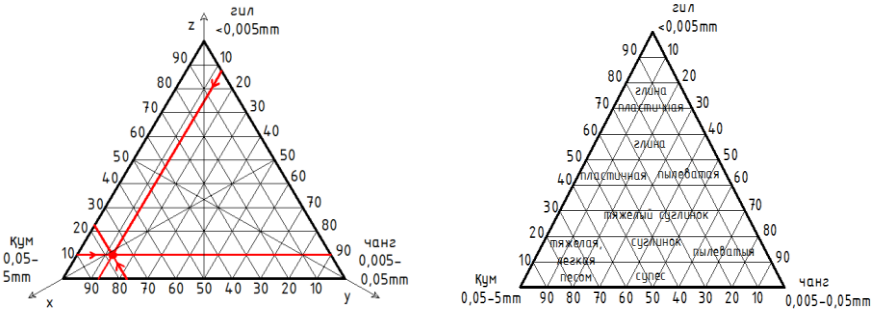

Figure 1. Three-dimensional sand-clay coordinates

Using a 2mm sieve of sifted soil and charcoal powder, a mixture of lightweight aggregates was prepared in the laboratory in the following proportions and included in Table 2.

Some ambiguity occurred, with O-47.06%, Na-1.67%, Mg-1.34%, Al-6.95%, Si-28.53%, K-2.44% in 20 spectra, Ca-8.01% and Fe-3.90% were found. The soil content was 0.63% Na before treatment and 1.67% Na after heat treatment. This means that in order to obtain light fillers, it is necessary to check not only the soil content, but also the sodium salts in coal and water. Otherwise, due to the salts in the water and coal, the amount of Na in the lightweight aggregate will increase and salinization will occur in the concrete.

In summary, the left side of the image in Figure 3 is whiter, has less porosity, and less particle integrity, due to insufficient temperature for the particles during the firing process and short firing time. As a result, some of the particles have not yet crystallized. In this case, the granules appear to be completely burnt, but microscopic analysis shows that the process is not complete. Therefore, it is necessary to prolong the burning time of the granules. It is recommended to check the amount of salts and other impurities in the water and coal dust added to the soil.

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