SCANNING ELECTRON MICROSCOPE (SEM) ANALYSIS OF CONCRETE MADE BASED ON FINE FRACTIONATED LIMESTONE WASTE OF THE SODA COMPANY

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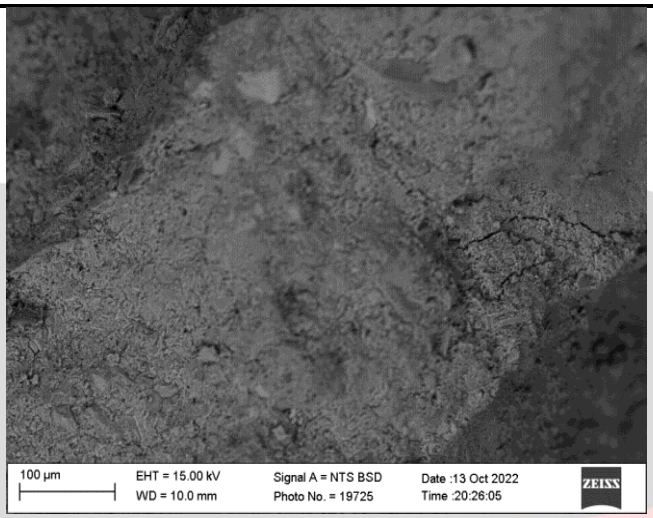
Annotation

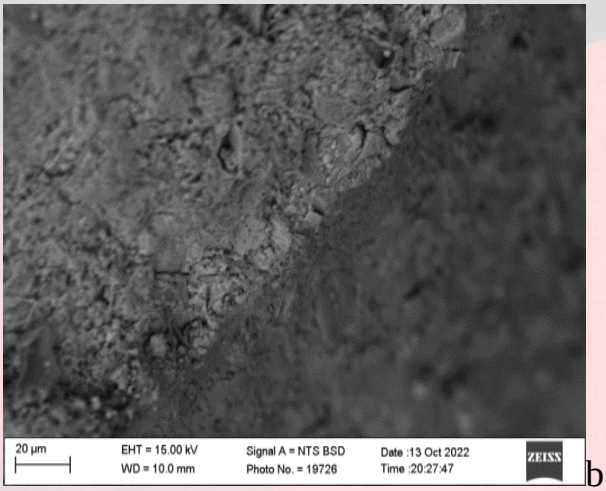
Today, 35-40 tons of small-fraction limestone waste is released as waste from the Kungirot soda enterprise located in the territory of Karakalpakstan of the Republic of Uzbekistan. This means that 12,775-14,600 tons of this type of waste are produced per year. Various physico-mechanical properties of concrete can be improved by adding these wastes to concretes as bulk aggregates in optimal compositions. In order to determine the reasons for the improvement of the physical and mechanical properties of the samples obtained on the basis of these wastes, the results of scanning electron microscope analyzes (SEM) were reported in the article.

Keywords: Soda plant waste, concrete strength, fine fraction limestone, Portland cement, SEM (scanning electron microscope).

From the results of the experiment, it became known that the concrete strength increases to a certain extent when soda ash is added to the concrete composition as a large filler of small-fraction limestone waste [1, 2]. In order to study the reason for the increase in strength of concrete in these concrete samples, in addition, the structural structure of the concrete samples with small fractional limestone waste from the soda enterprise and the areas of interaction of these waste with cement minerals were analyzed using a modern scanning electron microscope.



a



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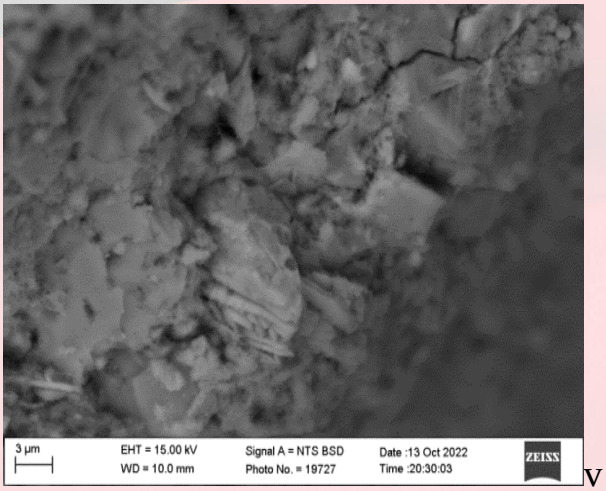

v

Picture. Microscopic analysis of concrete samples with the addition of fine-fraction limestone waste from the soda plant

The inclusion of these wastes in the composition of concrete in an optimal composition improves the strength of concrete and has a positive effect on its structure. Using a scanning electron microscope, the adjacent areas of the filler and cement stone of the samples containing these wastes were analyzed. In the a-samples zoomed in up to 100 times, it is generally seen that the aggregate and cement stone are interconnected, in the picture b, zoomed in up to 500 times, it was found that there are no microcracks in the adjacent areas, and in the picture v, zoomed in up to 2000 times, the hydrocarboaluminates in the cement are growing in the form of a dense microcrystalline conglomerate with each other and on the surface of carbonate micro-fillers it was found that he went. One of the main reasons for the increase in strength of concrete samples containing these wastes is the formation of strong calcium carboaluminate in the interface between the cement and the carbonate filler, although at a low speed during the hydration process.

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