

STUDY OF APPLICATION OF FILTER-PRESS SLUDGE OF SODA PLANTS AS AN ADDITIVE IN BUILDING MATERIALS

Radjabov Shokrukh, Yunusov Mirjalil, Mirzakulov Kholtura

Tashkent Institute of Chemical Technology, Tashkent, Uzbekistan

Abstract: *Disposal and processing of industrial waste is an urgent problem in the world. Processing of industrial waste, especially solid and liquid waste of soda production enterprises, and disposal of waste is a demand of the times. The opportunity to partially eliminate the economic and environmental problem by using the filter-press slurries of these enterprises as sodium chloride solutions and additives improving the physico-mechanical properties of concrete products and solid calcium waste as large and small fillers for concrete. is available.*

It has been shown that there is a possibility to add a certain amount of small fillers to the concrete composition after washing the filter-press sludge waste of the soda enterprise from the sodium chloride compound, to improve various physical and mechanical properties of the concrete and to increase its resistance to cold without losing its strength. Because these additives have the properties of pozzolan activity. For example, to improve the viscosity of concrete and its mobility, special additives are used today by construction companies. However, it was found that adding a certain amount of filter-press slurries purified from sodium chloride to the concrete will improve the properties of the concrete without reducing the strength of the concrete. Calcium hydrochloroaluminates with aluminum-containing phases of cement when a small amount of sodium chloride in these wastes is included in concrete; $C_3A \cdot NaCl \cdot 10H_2O$ ($N_p=1.54$ and $N_p=1.534$; $d_M=7.96 \cdot 10^{-10}$) forms hexagonal crystals. This leads to an increase in the amount of fine crystalline low-base modified sodium hydrosilicates in the solid phase, and this leads to an increase in the high cold resistance of concrete [].

For M200 grade concretes, the use of soda mill filter press slurry waste as fine aggregates has shown to significantly increase the compressive strength of concrete during the first 3 and 7 days.

Table

Strength of concrete samples with added filter-press slurry washed from sodium chloride

Raw material, weight %		Concrete strength over time, MPa					
Sand	Filter-press slurry	3 day	7 day	28 day	90 day	180 day	360 day
100	-	5,12	11,79	16,85	18,34	19,99	21,64
95	5	6,26	12,88	16,86	17,35	20,01	21,65

INTERNATIONAL SCIENTIFIC AND PRACTICE CONFERENCE ON " INTERNATIONAL EXPERIENCE IN INCREASING THE EFFECTIVENESS OF DISTANCE EDUCATION: PROBLEMS AND SOLUTIONS" SPECIAL ISSUE., 27 th March., 2022., France ., Joint Conference IJSSIR

90	10	6,33	12,93	16,91	17,36	20,01	21,66
88	12	6,31	12,91	16,94	17,35	20,00	21,65
85	15	6,31	12,88	16,92	17,34	20,00	21,64
83	17	5,25	11,80	16,77	17,16	19,88	21,45

It can be seen from the table that the concrete samples with filter-press slurry of the soda plant showed higher strength indicators in 3 and 7 days compared to the samples with conventional fillers. The highest indicators of waste consumption were observed when these wastes were included in the concrete composition in the amount of 15%. That is, 7.4% higher strength of concrete samples in 3-day period compared to conventional fillers, and 6.4% higher strength in 7-day period. After that, it was seen that the strength of concrete worsened as a result of the increase in the amount of these wastes in the composition of concrete. On the contrary, it was found that the viscosity and mobility of concrete improved significantly.

LITERATURE

1. Radjabov Sh.Sh., Atakuziev T.A. Hardening of carbonate filled concretes in different conditions // Asian Journal of Multidimensional Research ISSN: 2278-4853. Vol 9, Issue 11, November 2020. Impact Factor: SJIF 2020=6.882
2. Rajabov Sh.Sh., Yunusov M.Y., Mirzakulov Kh.Ch. Strength properties of carbonate filled concrete // International Journal of Discoveries and Innovations in Applied Sciences e-ISSN: 2792-3983 www.openaccessjournals.eu | Las Palmas. October 2021. Volume: 1 Issue: 5.
3. Rajabov Sh. Sh., Yunusov M. Y., Mirzakulov Kh. Ch. The effect of soda enterprises on the strength of low-grade concrete in the presence of various waste // ISSN: 2350-0328. International Journal of Advanced Research in Science, Engineering and Technology. India. Vol. 9, Issue 8, August 2022.