

INVESTIGATION OF THE EFFECT OF THE WIND AIR FLOW ON THE MECHANICAL STRENGTH OF THE FIXED ARAL SANDS

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At present, a great deal of attention has been paid to the study of the processes of removal and migration of salts by various natural factors (surface and groundwater, air flows). Protecting sand from wind erosion using water-soluble polymers, as well as mixtures with industrial non-toxic waste, is a solution to an important environmental problem. It should be take into account that the Aral Sea and the dried bottom of the Aral Sea are highly saline.

The work of a number of authors¹ proved that such soil properties as structure, water resistance of aggregates, humus content and humidity are the main factors determining their anti-erosion and anti-deflationary stability².

We have used the method of preliminary liming of soil and soil to increase the effectiveness of surfactant additives and reduce their dosage when combined with calcium hydroxide or ash.

It is known that the liming of soil grounds contributes to a sharp increase in the pH of soil solutions, the replacement of monovalent ions with Ca²⁺ ions in the absorbing complex of soil particles and, as a result, the strengthening of the soil microstructure and the replenishment of organic soil.

However, the process of liming by itself does not lead to the improvement of the microstructural state (aggregates > 0.25 mm) in the soil and the production of water resistant macroaggregates. At the same time, the presence of soluble salts in certain limits up to 20-30% even contribute to the improvement of the properties of the soil strengthened with the help of lime.

As for the other components of complex additives, it follows from what has been said that they must be substances capable of forming with the salts any compositions (not necessarily chemical compounds) that must be localized in the structure formed in the «soil-salt-Ca(OH)₂-water addition».

References

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2. Agzamkhodzhayev A.A., Kuldasheva Sh.A., Kuchkarova M.N., Dusmukhamedov A. Chemical fixation of saline soils as a way to solve some environmental problems of the Aral Sea //Osh State University Bulletin. Chemistry and chemical technology series. 2001, №. 2, P. 188-191.