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A tendency to increasing the volumes of production and application of low cement refractory concrete has determined the development of theoretical and practical aspects of modifying concrete with surfactants. Varying the rate of hydration of calcium aluminate cement, surfactants (deflocculants) has influenced the rheotechnological characteristics of concrete masses and their consolidation, formation of the solid low porosity concrete structure, both when hardening at normal temperatures and in conditions of thermal heating.

The influence of the low cement refractory cement deflocculant − sodium tripolyphosphate and a complex modifier, containing sodium tripolyphosphate, and an organic superplasticizer, on changing the nature of hydration processes of cement and the ratio between the crystalline and amorphous phases, the strength properties of cement stone at early stages of hardening, was studied in the paper. The differences in spatial orientation and density of the nanostructures on the surface of cement crystallohydrates, modified with sodium tripolyphosphate and the complex modifier were revealed. It was found that the complex modifier, presented by surfactants of different nature, has a significant influence on the formation of a finely porous and mechanically strong structure of composite material, physical and technical properties of the heat-treated concrete.

Keywords: low cement refractory concrete, calcium aluminate cement, hydration, modifier, amorphous phase, crystallohydrates, microstructure.