

Current Trends in the Production of Concrete with Specified Properties

Egamberdiyev Murod1, To'xtaeva Khabiba, Akmalov Muhiddin

Tashkent Institute of irrigation and agricultural Mechanization engineers Bukhara Branch, 32 Gazli shokh ave,
Bukhara, Uzbekistan

ABSTRACT: Obtaining polymer concretes by adding composite materials, serves the development of modern concrete technology. Various additives are added to obtain concrete structures of the specified properties. Based on the obtained data, a procedure for multicritical optimization was developed, which provides a technological mode of production and the development of a composition with defined characteristics of production. As a result, high-quality composite polymer concrete was created.

KEYWORDS: Composite material, polymer concrete, sodium silicate solution, barium chloride, modern concrete technology, liquid glass compositions, Mastic, mineral formaldehyde resin.

Methods: Currently, the technological aspect of heavy concrete, especially for special purposes, used for the production of concrete structures with a certain property, high strength, has its drawbacks for various reasons - low adhesion of the compound to the dispersed phase, delamination of the mixture (instability of deposition) and operation - uneven adhesion of individual components, uniformity of protective properties, low strength. All these problems are mainly related to the concept of obtaining such materials, that is, with the addition of the properties of the components additionally. Therefore, natural or synthetic (industrial waste) dispersion phases with high density are used to ensure high protective properties of especially heavy concrete. Such an approach at the stage of development of the science of building materials gives a clear positive result, which plays an important role in the development of industry and the implementation of tasks to increase the country's production capacity. At the present stage of scientific ownership of production, it is extremely important to implement the concept of designing and creating a composite material with established performance indicators based on the basic laws and experimental statistical models obtained.

It is desirable to study the processes of composition formation at all necessary levels of the structure and to establish the influence of the control formulation and technological factors on the physic-mechanical and operational properties of the compositions. Based on the information received, an important task is to carry out multi-criteria optimization, which will ensure the technological mode of production and the release of a composition with established production characteristics.

Using systematic methods of analysis, it provides a basis for the selection of special methods for the synthesis of target materials, including a recipe for the control of a system of quality criteria for materials that protect against external influences, and the determination of technological auxiliaries, chemical elements that ensure effective absorption of radiation, as well as the selection of composite components that form the necessary chemical composition.

Various additives are added to obtain concrete structures with specified properties. They are the most common among them; it is a solution of sodium silicate. The possibility of increasing the properties by 10-45% is created by using a solution of sodium silicate in combination with various additives. The use of barium chloride acts as a strengthening agent for sodium silicate solutions. Empirical data on the influence of control prescription and technological factors on the parameters of the structure, physic-mechanical and operational properties of the proposed compositions serve as a guide for research.

The results obtained will allow us to deepen knowledge about the construction of compositions based on liquid glass of expands, the concept of synthesis of composites with the specified quality indicators of expands and formulate ideas for the synthesis of primary nanomaterial's suitable for Nano modification of the structure and properties of expands building materials.

There are different opinions about the contribution of components to expressiveness, including chemical protective properties. So, A.P. Veselkin, E.V. Voskresensky, V.A. According to Egorov and other researchers, protective properties are determined by substances that are embedded in it. Other scientists, such as V.P. Mashkovich, A.V. Kudryavtseva, B.N. Vinogradov and others, reject this statement and emphasize that the type of compound significantly affects the protective properties of concrete. Therefore, when developing new protective compositions, it is necessary to take into account the chemical and physical properties of all components.

Traditionally, binders of mineral and organic substances are used for the development of chemical-protective concretes and solutions. Among organic compounds, epoxy, furan, phenolic, polyester, resorcinformaldehyde resins, polypotadiene oligomers, as well as Portland cement, aluminum oxide and sulfur cement, some special cements (in terms of boron content), magnesium, barite, Sorel cement, superconducting sulfate-complex cements made of slag cement and lead, for example, lead-barium and iron-lead- barium cements), as well as solutions of sodium silicate (trade name "liquid glass"), metal oxides.

Mineral fasteners are widely used to protect Portland cement from chemical influences. This is due to the ability to form a cement stone, which, when hardened, has a content of up to 20% chemically bound water. Modern requirements for this type of fasteners determine the production of high-strength and dense compositions. These requirements are relevant in the production of chemical protective composites. This effect can be achieved by reducing the water-cement ratio S/T s, as well as using other physical, chemical, physico-chemical and other methods. The use of cement with high dispersion significantly increases its strength by increasing the amount of hydration products of cement stone in the initial period, and also accelerates the hardening processes, which is accompanied by a decrease in strength during operation.

by crushing cement-based cement stone, they produce composites v with $=0.171$ Portland/... elevated is 0.260 with a capacity $azhrilib.20...$ The composition of the press with a pressure of 25 MPa is 15 binders... A reduction of up to 20% reduces the cosine of the cement composition (more than 400 sees), frost resistance, its water absorption (up to 2.5%) and the deformation of the reduction, which is known as the base.

Liquid glass, soluble glass-like is obtained on the basis of an aqueous solution of sodium and potassium silicates, an effective composition. The powdered substances are used in Kurukol: potassium fluorosilicate, ferrochrome, gypsum, Portland cement, ferrosilicon, calcium aluminate, magnesium sulfate, borax, sodium and calcium phosphate, sodium and Basques.

High-performance materials based on cold glass high power indicators - heat, fire resistance and, but, resistance to water with acid resistance in the past, resistance to processing, resistance to compression deformation high, such as resistance to performance.

Polymer concrete with participation has the strength of high, epoxy citron with the tensile strength of paste, good chemical resistance, and waterproof, high adhesion ability. The beginner knows that the influence on the stability of materials and the features of the developed radiation sensitively irritates the technology, worsens the resistance to radiation and the load on the epoxy polymers: resistance to heat, therefore, resistance to radiation knows how great the load is. The polymerizing medium is epoxy resin, which strengthens the epoxy resin, when increases the reaction rate and the deformation rate, when is needed, you should take heat dissociation. The main problem of foaming epoxy fasteners is their limitation.

For the manufacture of resorting-formaldehyde carton it is recommended to use mastics, they can be used in works on transportation and restoration and decoration of buildings and structures that work in the conditions of Asia, as well as in the epigraphy of grinding materials, in the epigraphy of bulls and drains in building structures, on leveling surfaces. Nary has the characteristics of the quality of materials based on them, and has the cheaper of the citrons: the density of is $1600...3250/m^3$; pressure strength - 86.2 kg... 102.4 MPa; water absorption is 2.5...4.8%; the coefficient of water resistance is 0.67... 0.76; total porosity is 1.5... Ni is transported by 7.5%.

Irradiation is used as an astringent in cases of hair loss. Polybutadiene oligomers are obtained from a new type of concrete based on boar rubber - the so-called rubber concrete.

There are several theories of solidification of a liquid bottle based on different concepts of composition formation, different compositions of which are performed depending on the type and quantity of the component. However, the process of such an alloy proceeds at a low speed and slows down due to the formation of a dense impermeable film on the surface. Research conducted on modern equipment by E.F.Medvedev and you know what? The phase composition of sodium silicate obtained by Komarevskaya as a result of IR spectroscopy includes sodium silicate of various symmetries, sodium carbonate, which interacts with free silicon and carbon dioxide.

The amount of cured salts contained in the compositions of liquid glass must correspond to the element metric ratio of this salt in its reaction with sodium or potassium silicate.

M.A.Matveev and V.P.Dyatlov showed that at the first stage of the curing of the silicate bond, unlike other coagulants studied, the addition of sodium fluorosilicate leads to the plastic rubber mass becoming yellowish.

The process of structuring liquid glass using sodium is well studied. The interaction of fluorosilicate salts with alkaline silicates forms a gel of silicic acid and corresponding fluoride salts. However, no clear conclusion was made about the mechanism of this process. Some researchers believe that sodium fluorosilicate reacts chemically with silicates. As a result, a gel of silicic acid is formed, it thickens when water is released, and the filler grains are cement. Other scientists have noted that the appearance of gelatinous silicon is not due to chemical interaction, but to the coagulation of silicate acid of Zeolite, which is stabilized by hydroxide. It should be noted that most researchers recognize the first glance.

Liquid glass ensures the strength of concrete due to its unlimited adhesion to the Ca²⁺ ion contained in cement. But re-hydration plays an important role in this process. In the process of hydration of liquid glass, the solution can form Nano, pentane, rehydrate. Among them, the high water solubility of Na₂SiO₃*5H₂O has the opposite effect on concrete reinforcement.

Therefore, instead of liquid glass, colloidal silica is used in accordance with the purpose.

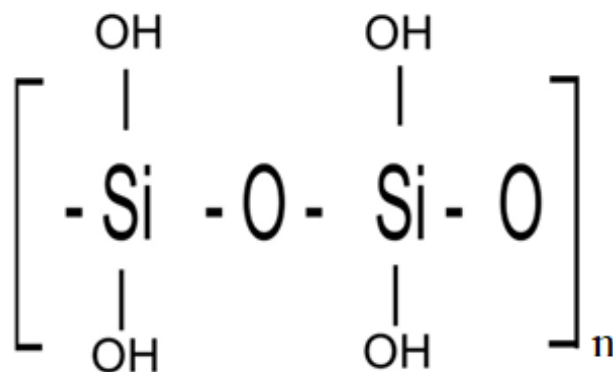


Figure 1. Effect of colloidal silicon concentration on concrete strength.

Figure 1 in apparently, with an increase in the concentration of colloidal silicon, an increase in the strength of concrete is observed, and this value passes a maximum in the range of 9.3-10.8%. This means that when storing the concentration of colloidal silicon in this range, an image of obtaining specific samples with specified properties is created.

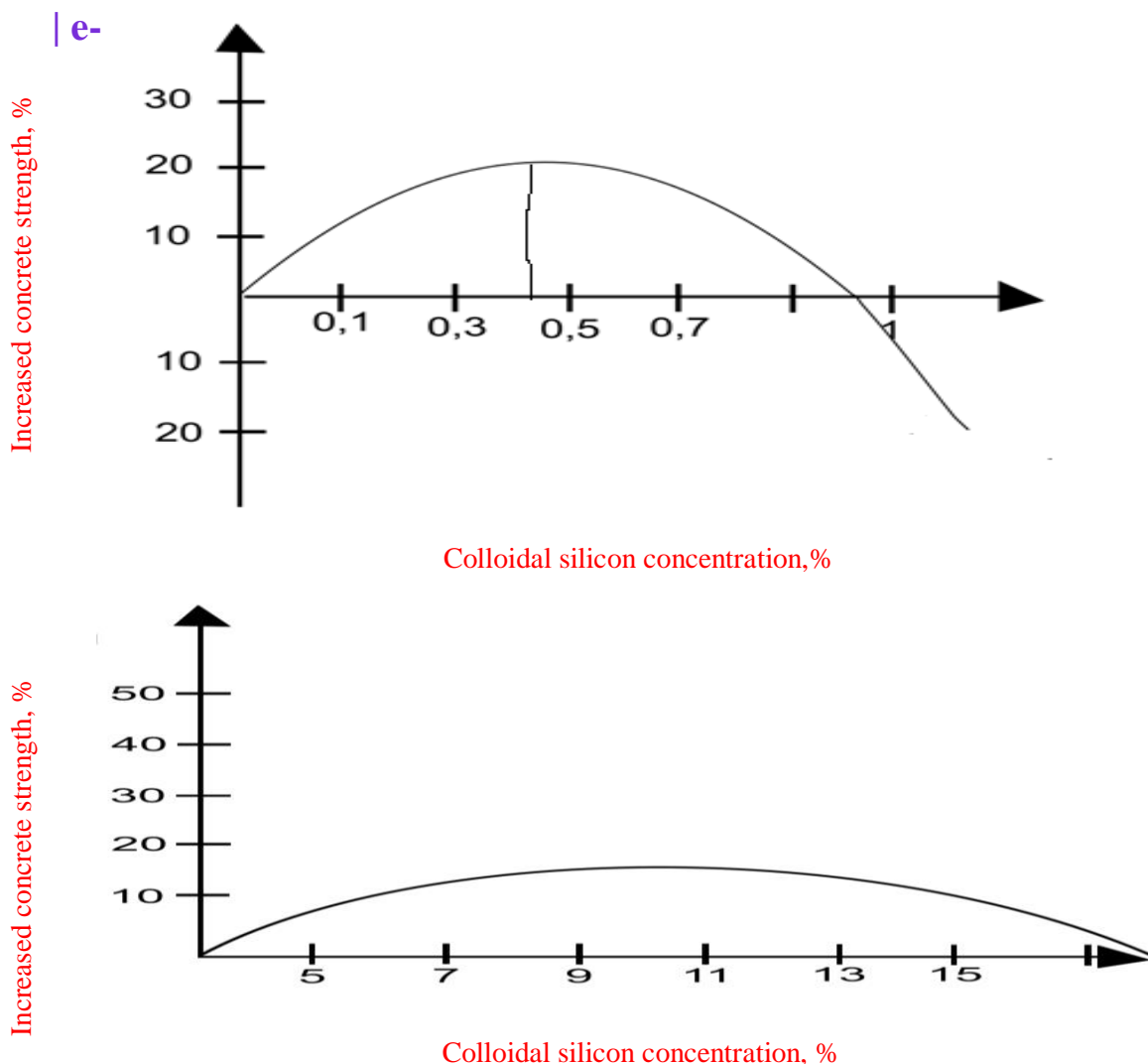


Figure 2. Effect of colloidal silicon consumption on concrete strength relative to cement

With an increase in concentration and quantity, an increase and then a decrease in the consistency of concrete was observed before recovery.

Colloidal silica was synthesized by the membrane method according to the traditional method and a carrier from 0.1% to 10% by weight of cement was found in the form of a 5-15% solution.

Figure 2 in apparently, the possibility of obtaining concrete of this property is limited by increasing the amount of the component of any additive. This, in turn, is explained by an increase in the number of molecules that inhibit the maturation of the cement bilapna tooth.

CONCLUSIONS

In conclusion, it should be noted that it is possible to obtain high-quality concrete samples with various effects by using colloidal silica.

References

1. Proshin, A.P. Solutions for radiation protection: monograph/ A.P. Proshin, E.V. Korolev, N.A. Ochkina, S.M. Sadenko. Penza: PGASA, 2002. 202 p.
2. Veselkin, A.P. The study of the protective properties of concretes of various compositions: monograph / A.P. Veselkin, E.V. Voskresensky, V.A. Egorov/ / Questions of physics of reactor protection. Moscow: Atomizdat, 1974. 230 p.

3. Mashkovich, V.P. Protection from ionizing radiation: monograph / V.P.Mashkovich, A.V.Kudryavtseva., 1995. Energoatomizdat M.: 128 p.
4. Vinogradov, B.N. The influence of aggregates on the structure and properties of concrete: monograph/ B.N.Vinogradov, 1986.Strizdat M.: 249 p.
5. Iskovich, S.M. Fillers of concrete technology: monograph / S.M.Iskovich, L.D.Chumakov, Yu.M.Bazhenov. M.: Higher School, 1991. 272 p.
6. Silicon processing technology F.F., Akhmedov V.N.Rakhimov "Scientific and technical progress" scientific and technical journal "No. 3/2019 building materials with organosilicon compounds
7. Rakhimov F.F., Akhmedov V.N., Aminav F.F., method of obtaining hydrophobic compositions Universum: Chemical and Biological journal 4 (70) Moscow 2020 63-65 P.
8. V.N.Akhmedov, L.N.Niyazov, F.F.Rakhimov, N.S.Panov, K.E.Hydrophobization of Bukhara in the monograph "Construction" by Ruziev, Masterpiece 2018
9. Rakhimov F.F., Akhmedov V.N. Technology of obtaining hydrophobic structural materials published in the journal "Composite Materials". No. 3, 2020.
10. Akhmedov V.N., Niyazi L.N., Rakhimov F.F., K.E., Panov N.S.Ruzeva. Ecological aspects of saline buildings "The role of science and education in solving environmental problems", Materials of the Republican Scientific and Practical Conference Bukhara-2018 110-111C.
11. Akhmedov V.N., Niyazi L.N., Rakhimov F.F.N.S.Panov. Method of obtaining silicon Science news of Kazakhstan scientific and Technical journal No. 3 (141) from Almaty 2019 35-43
12. Jurakulovna, J. G. (2021). The Necessity and Theoretical Basis of Financial Statement Analysis in Modern Management. *Academic Journal of Digital Economics and Stability*, 7, 89-95.
13. <https://www.neliti.com/publications/343193/application-of-modern-water-saving-irrigation-technologies-in-conditions-bukhara>
14. <https://cyberleninka.ru/article/n/study-of-local-irrigation-systems-and-selection-of-the-most-appropriate-features-for-the-efficient-use-of-water-and-land-resources>