

## **Project № 2 MES of the RK**

Theme of program: «Разработка теплоизоляционных материалов на основе казахстанского диатомита для обмуровки высокотемпературных узлов котлоагрегатов»

Project Manager – Ass.professor Dilmukhambetov E.E.

The amount of funding for 2017y. – 4 117 500 tenge

Involved in research projects: Ukibayev Zh.K.

The results obtained: the main physicochemical and physicomechanical properties of the Mugodzhar diatomite have been established as a promising raw material for the production of thermal insulation materials; the possibilities and conditions for the use of rice husk as burnable additives in diatomite heat insulators; It is shown that inorganic basalt fibers as reinforcing additives in the compositions of dry mixtures based on diatomite, contribute not only to the hardening of the material during roasting, but also reduce fire shrinkage; The main physicomechanical characteristics of diatomite heat insulators with a burnable additive, obtained in this work, are within the technical requirements of GOST: linear shrinkage - less than 2%; density - in the range of 0.04-0.5 g / cm<sup>3</sup>; compressive strength - not less than 1.0 MPa; bending strength - not less than 0.3 MPa; thermal conductivity coefficient - 0.05-0.08 W / m • K; It is shown that the addition of copolymers based on PEG-NVCL, PVA and starch contribute to the reduction of shrinkage of materials during drying and roasting, this effect is achieved by adding polymer to 1% by weight; Correlations between the coefficients of thermal conductivity, strength and density of disperso-reinforced heat insulators with burnable additives were established, allowing to optimize the initial composition of the mixture for the manufacture of thermal insulation products based on diatomite; with the optimal composition of the dry mixture D: RSH: BV: P 70:15:11: 4, while mixing with water in the ratio of 1.25 to the dry mixture, laboratory samples of heat-insulating plates and semi-cylinders with physical-mechanical and thermal characteristics corresponding to GOST were made ; Technological bases for the manufacture of diatomite-based thermal insulation products with burnable additives have been developed in relation to the existing brick factory production.

The obtained results can be recommended in the development of technological solutions for the production of thermal insulation materials based on Kazakhstan diatomite. Especially the results will be useful for the production of molded insulation products in the form of blocks, plates, segments (shells) and half-cylinders.

Technical and economic efficiency of the implementation of the results of the work may be high in the case of large-scale production of insulating products..

High needs of heat generating enterprises of the Republic of Kazakhstan in molded insulation products for the repair of boiler units provide a high potential for commercialization of project results.

The scientific and technical level of the performed research is not inferior to the well-known russian works in the field of utilization of rice husk as a burnable additive for the production of porous diatomite products