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STUDY OF THERMAL PHYSICAL PROPERTIES MULTI-COMPONENT BUILDING MATERIALS

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Аннотация

В статье рассмотрено теплофизические свойства строительных материалов и изделий на их основе при гелиотепловой оброботки.

Ключевые слова:

Золоцементных, теплопроводность, плотность, влагосодержания, давления, гелиотеплохимической, композиционных материалов, гелиотеплохимической.

Актуальность

Теплофизические свойства многокомпонентных материалов зависят от многих факторов и в первую очередь от объёмной массы, поровой структуры, влажности и режима гелиотеплохимической обработки.

Annotation

The article deals with the thermophysical properties of building materials and products based on them during solar thermal treatment.

Keywords:

Ash-cement, thermal conductivity, density, moisture content, pressure, heliothermal chemistry, composite materials, heliothermal chemistry.

Relevance

The thermophysical properties of multicomponent materials depend on many factors, and first of all on the bulk mass, pore structure, moisture, and the regime of heliothermal treatment.

By controlling the structure and structural characteristics, it is possible to create effective materials with improved thermophysical characteristics [1].

Since an increase in the temperature of the structure-forming medium under heliothermal chemical action accelerates the hardening process of the ash-cement product, the heat and mass transfer coefficients will also depend on the temperature regime [2].

At the same time, the thermal conductivity of solid phases, due to phase and structural transformations occurring in the ash-cement product during cement hydration, increases over time [3].

During structure formation during heliothermal chemical treatment, the coefficient of thermal conductivity, thermal diffusivity and heat capacity changes. In particular, it will depend on the size of the fraction (Sуд) of the filler, the grade of cement (m), the water-cement ratio (W/C), modified plasticizing additives (MPD), which affects the composition and amount of the filling medium in the pores and on the temperature of the sealed water and heated air in solar heat-generating units [4, 5, 6].

Discussion. The main experimental factors were selected as the initial data for obtaining the values of the thermal conductivity coefficient λ and their boundary values were determined on the basis of a priori experimental information.

It has been established that the trend of change in λ under the considered modes has the same character: a slight increase in the values of λ is replaced by a significant drop, and then an increase and stabilization. The range of changes in thermal conductivity under different modes of solar thermal treatment is almost the same, which mainly indicates the influence of the composition and brand of a fine-grained composite product with a polystructural structure.

The hardening temperature of the composite product influences the periods of occurrence of the minimum λ and the coefficient reaching a constant value: at tmax the minimum and the stabilization stage of λ occurs faster. At low temperatures, the test stage of stabilization λ occurs later and the curve of the change in thermal conductivity has a flatter character and reaches the stabilization stage more slowly. And during the structure formation of ash-cement composite products under natural conditions, the decrease and increase in λ values is extended over time.

If we compare the course of the curves of heat release intensity q3 and thermal conductivity coefficients, an interesting pattern is determined that the periods of arrival of the minimum λ and maximum qe coincide, which is a consequence of the structure formation of polystructural fine-grained composite materials during solar-thermochemical processing; the influence of temperature affects the acceleration or retardation of these processes.

In Fig. Figure 1 shows the relationship between the intensity of heat release qe, thermal conductivity λ and the rate of change of heat release d qe / d τ of the structure-forming composite product. Analysis and comparison of the results allowed me to propose an interesting relationship consisting in the following: that the arrival of the absolute minimum values of d qe / d τ coincides with the beginning of the period of stabilization of the values of the thermal conductivity coefficient, and the absolute maximum of heat release q3 corresponds to the absolute minimum of the value λ. This means that if the course of the q3 curves is known, then by calculating the derivative d qe / d τ, it is possible to construct for a given mode of solar-thermochemical treatment a predictive dependence of the thermal conductivity coefficient in the process of structure formation of highly filled ash-cement composite materials with a polystructural structure.

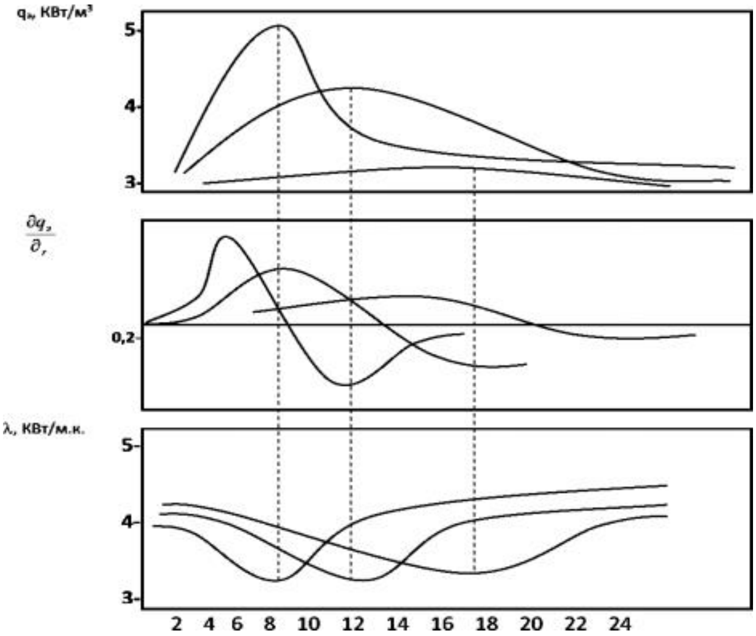

Figure 1 - Relationship between the intensity of heat release and its rate

changes and thermal conductivity of polystructural composite material

buildings. 1- GTCS mode without MTD: 2- GTCS mode with MCC:

3-mode of structure formation in natural conditions.

Thus, regulation of the thermophysical properties of composite products by heliothermochemical exposure before and during the period of structure formation is possible by regulating the pore structure, humidity, dispersity of the main component substance, temperature regime, and the type and amount of modified plasticizing additives.

List of used literature:

1. А.Х.Алиназаров. Энергоэффективная теплотехнология получения золоцементных композиционных материалов: монография. Москва: РУСАЙНС, 2019-168 с
2. А.Х.Алиназаров. Энерго и ресурсосберегающая технология получения строительных материалов и изделий методом гелиотеплохимической обработки: монография. Москва: РУСАЙНС, 2017 -138 с
3. Alinazarova M., Gulyamov A.G., Alinazarov A.Kh. Control Over the Thermal Propertis of Fine Composite Materials in Solar Thermochemical Treatment. Applied Solar Energy, vol.38, No 3, Allerton Press, Ins / New York 2002. p.p. 75 -78
4. Мажидов, Н. Н., Атамов, А. А., Курбанов, К. М., & Юнусхонов, А. А. (2022). Перспективы Использования Солнечной Энергии, Достоинства И Недостатки. *Central Asian Journal of Theoretical and Applied Science*, *3*(11), 49-56.

5. Negmatov, M. K., Atamov, A. A., & Buriev, E. S. (2017). Automation of water supply systems and instrumentation. *Study guide/-Tashkent: ed."Tafakkur Bustoni*.
6. Алиназаров, А., Атамов, А., & Хайдаров, Ш. (2021). Гелиотеплохимическое воздействие с учётом экзотермии в многокомпонентных цементных материалах. *Annali d'Italia*, (17-1), 55-59.
7. Негматов, М. К., Атамов, А. А., & Буриев, Э. С. (2017). Автоматика систем водоснабжения и контрольноизмерительные приборы. *Учебное пособие/-Ташкент: изд."Тафаккур Бустони*.
8. Алиназаров, А. Х., Атамов, А. А., & Хайдаров, Ш. Э. (2021). Методика решения изменения мощности внутреннего источника тепла с учетом солнечной радиации в многокомпонентных цементных материалах. *The scientific heritage*, (62-1), 49-52.
9. Алиназаров, А. Х., Каюмов, Д., & Дадамирзаев, О. (2021). Оптимизации режимов гелиотеплохимической обработки золоцементных композиций. *Central Asian Journal of Theoretical and Applied Science*, *2*(5), 133-138.
10. Алиназаров, А. Х., Ражабова, М. Н., Атамов, А. А., & Мажидов, Н. Н. (2001). Кинетика твердения золоцементных композиций при механохимической активации. *Проблемы механики*, (3-4), 41-43.
11. Alinazarov, A. K., Atamov, A. A., & Mukhiddinov, D. N. (2001). Hydrophysical properties of ash-cement compositions and their effect on solar thermal chemical treatment. *Applied solar energy*, *37*(1), 44-48.
12. Kh, A. A. (2021). Atamov AA Khaidarov Sh. E., Mathematical modeling of heliothermal processes in physico-chemical interaction with liquid media. *EPRA International Journal of Multidisciplinary Research*, (7-5), 200-208.
13. Негматов, М. К., Атамов, А. А., & Жураев, Х. А. Перспективы использования фильтроперлита для очистки производственных сточных вод. *ЖУРНАЛИ*, 142.
14. Алиназаров, А. Х., Атамов, А. А., Салимжонов, Ж. Х., & Хайдаров, Ш. Э. (2022). Методика Решения Изменения Экзотермии С Учетом Солнечной Радиации В Многокомпонентных Цементных Материалах. *Central Asian Journal of Theoretical and Applied Science*, *3*(10), 1-9.
15. Негматов, М. К., Атамов, А. А., Негматов, У. М., Вспомогательными, Г. О. П. С., & Материалами, Ф. (2020, June). ECLSS Online 2020b. In *2nd ECLSS International Online Conference on Economics and Social Sciences. Istanbul/TURKEY.*
16. Atamov, A. A., & Majidov, N. N. (2019). The method of increasing efficiency with changing the cross section of pipes on the installation of a heat exchanger. *Экономика и социум*, (11 (66)), 12-15.
17. Negmatov, M. K., & Atamov, A. A. Suv ta'minoti tizimlari avtomatikasi va nazorat-o'lchov asboblari.". *Tafakkur bustoni" nashriyoti*, *1*, 1-367.
18. Атамов, А. А. (2021). ПОДАЧА ЖИДКОГО ГАЗА И МЕРЫ БЫТОВОЙ БЕЗОПАСНОСТИ. *Экономика и социум*, (2-1 (81)), 499-501.
19. Atamov, A. A., & Majidov, N. N. (2019). Increase of reliability of gas supply. *Экономика и социум*, (5 (60)), 32-34.
20. Алиназаров, А. Х., Атамов, А. А., & Атамова, Д. А. (2022). Особенности Конструкции Котельного Оборудования И Повышения Эффективности Сгорания Топлива. *Central Asian Journal of Theoretical and Applied Science*, *3*(10), 133-142.
21. Erkinovna, C. V. (2023). The Place of Jalaliddin Rumi in the History of Philosophical Thought. BioGecko, 12(4), 616-624.

22. Shoxabbos, S., & Mahramovich, K. S. M. K. S. (2023). CAUSES OF THE ORIGIN OF CARDIOVASCULAR DISEASES AND THEIR PROTECTION. *IQRO JURNALI*, 1-6.
23. Nozimjon og'li, S. S. (2022). INTRAEPITHELIAL IN VARIOUS PARTS OF THE SMALL INTESTINE QUANTITATIVE INDICATORS OF LYMPHOCYTES. *YANGI O'ZBEKISTONDA MILLIY TARAQQIYOT VA INNOVASIYALAR*, 175-178.