



Physicochemical particular qualities of the crystallization process of inorganic heat-storage materials' melts

Shamshiya Amerkhanova¹, Valery Aleksandrov², Rustam Shlyapov¹, Aitolkyn Uali¹

¹ *L.N.Gumilyov Eurasian National University, K. Munaitpassov St., 13, Astana, Republic of Kazakhstan, 010008*

² *Donbas National Academy of Civil Engineering and Architecture, Derzhavin st., 2, Makeyevka, Ukraine, 86123*

E-mail: rustamshlyapow@gmail.com

The literature analysis devoted to the crystallization problems has shown that nowadays the clear understanding of mechanisms of mass crystallization and growth of single crystals has been formulated. The scientific methods to control the structure and properties of the solid phase have been developed. However, literature data shows numerous contradictions in the results obtained for the same substances using various methods and techniques. Some papers show the lack of systematic approach to the study of different substances by considering the periodicity of the molecular and crystalline structure. Therefore, studies of cluster-coagulation model for some inorganic substances and mixtures of sodium thiosulfate with salts of elements (VI) of A, B groups were carried out. Based on the obtained results, the analysis of Gibbs energy for real structures was carried out. The applicability of the possibilities of thermal analysis for decoding thermograms characterizing different types of crystallization was justified. An analysis of the thermal effects characterizing the crystallization of supercooled melts on the base of the cluster-coagulation model was carried out [1]. For melts of sodium thiosulfate pentahydrate mixtures with selenate, tellurate, molybdate and sodium tungstate, the thermodynamic and electrochemical confirmation of heat accumulation has been found. The stabilizing effect of rare elements ions in anionic form on the associates of sodium thiosulfate with water molecules has been found. Both of them allow accumulating the energy coming to the system, followed by its release during cooling [2].

[1] Alexandrov VD, Postnikov VA. Letters in ZhTF, 2003, - Vol. 29, no. 7. - P. 48-54

[2] Amerkhanova Sh.K., Aleksandrov VD, Belgibaeva DS, Shlyapov RM, Uali A.S. Bulletin of ENU named after. L.N. Gumilev. Ser. ETC.-2015, -№6.-P. 288 - 295

