COLD STORAGE MATERIALS ON THE BASIS OF $Na_2S_2O_3 \cdot 5H_2O$ – $Na_2SO_4 \cdot 10H_2O$, $Na_2S_2O_3 \cdot 5H_2O$ – $Na_2SO_3 \cdot 7H_2O$ AND $Na_2SO_4 \cdot 10H_2O$ – $Na_2SO_3 \cdot 7H_2O$ CRYSTALLINE HYDRATES MIXES

Aleksandrov V.D., Sobol O.V., Sobolev A.Yu., Syrovatsky V.A.

Donbas National Academy of Civil Engineering and Architecture, Donetsk
cluck@mail.ru

Recently much attention is paid to cold accumulation. It is due to the fact that it was widely used for temperature stabilization of some radio elements and the optoelectronic package, in the refrigerating equipment for storage and transportation of medical supplies, foodstuff, etc. Cold accumulation is carried out, as a rule, by means of individual substances or their mixes, which absorb or emit energy due to the latent heat of phase change "liquid-solid" without mass transfer at temperatures below 0°C. However in the absence of important physical and chemical characteristics (character of melting and crystallization, reversibility and stability of melting and crystallization temperatures at repeated phase changes, etc.) for many water-salt systems excludes a possibility of use them as cold accumulators without carrying out special researches. Practical use of cold storage materials demands development of the reliable constructive decisions directed to the maximum use of merits of the specified materials.

In this work we offered selection methodology of crystalline hydrates mixes compositions on the basis of creation and the analysis of equilibrium and nonequilibrium phase diagrams for ensuring crystallization with small supercoolings depending on concentration of components and the thermal history of a fluid phase.

By the methods of thermal analysis there were studied supercoolings in mixes of sodium thiosulphate pentahydrate ($Na_2S_2O_3\ 5H_2O$), decahydrate of sodium sulfate ($Na_2SO_4\ 10H_2O$) and sodium sulfite heptahydrate ($Na_2SO_3\ 7H_2O$) crystalline hydrates to ascertain best compositions fulfil requirements imposed to cold storage materials.