

RESEARCH OF PROPERTIES OF HEAT-RETAINING SUBSTANCES

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Goal: Experimental research of properties of heat-retaining substances with a phase transition (PCM) is sent to the increase of efficiency of utilization of thermal energy, her accumulation and further use in the systems of heat supply.

Results: In the countries of EU researches come true from utilization of low potential warmth in the range of workers of temperatures $+30\dots+100^{\circ}\text{C}$. On this time there are plenty of constructions of thermal energy saver on the basis of PCM, that for storage of energy use the hidden warmth of phase transition. Unfortunately such systems do not find a wide consumption. Principal reason consists in that the row of properties of PCM does thermal energy saver expensive enough in a production and difficult in exploitation.

We were study properties to the three sodium acetate trihydrate, ozocerite and solution of technical bischofite. These substances have insignificant corrosive activity and subzero prime price. Also they provide the capacity of the system at the temperature of environment to -30°C .

As a result of the conducted work it is set:

1. At the change of temperature from 20 to a 100°C ozocerite finds out the signs of amorphous substance (absent phase transition), here the volume of standard changes on 5.7%. Taking into account, that the heat capacity of ozocerite below than heat capacity of water, his use it is possible to consider inadvisable.

2. The three sodium acetate trihydrate without the presence of centers of crystallization can it is enough long (a few twenty-four hours) to be in the state of the super cooled liquid, in transition from a liquid phase his heat-conducting that considerably complicates the construction of thermal energy saver on his basis goes down in hard. And after 20...30 cycles of heating-cooling a substance gradually loses the properties as a result of change of her chemical composition

3. After 3...4 cycles of heating/of cooling of solution of technical bischofite fall out darkly-yellow insoluble sediment that requires application of additional filters in the system of circulation of coolant-moderator and their permanent service.

Conclusions:

1. Use of the system on basis to the three sodium acetate trihydrate possible after a decision question of stabilizing of him chemical composition during time of exploitation.

2. For industrial application in the systems of heating for today most suitable is a heat-retaining substance on the basis of water with addition of antifreeze.