**SPECIFIC HEAT OF FLAME-PROOF VERMICULITE PLATES IN THE TEMPERATURE RANGE FROM 300 TO 900 K**

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Vermiculite is one of the most safety, environmentally appropriate, biostable and unique minerals all over the world. Accelerated kilning creates the swelling of natural material with the increase of its volume in ten times. Zonolite is used as raw material for the universal purpose, specifically for creation of fireproof and heat-shielding materials. Vermiculite is used at temperature ranging from 15 to 1500 K. Nevertheless thermophysical properties of vermiculite are studied not enough, and their research would be able to use this material more effectively. In this work we describe the method of thermal capacity measurement between 300 and 900 K and our results, that we obtained using this method on the vermiculite plates as industrial sample.

The samples were produced at the Industrial-technological company “A+B”. The plate was prepared by pressing the mix, that components were a swelling Mg-vermiculite from Condor and the binding Al-B-P-agent in ratio 67/33. After 24-hours drying (*T* = 363 K) the plate density was 940 kg/m3. The decrease of plate weight was ~0.5 %. However the dried up plate may adsorb moisture from air during storage. The thermal capacity measurements of composite were performed on samples in air at a heating rate of 3 K/s in two passes, using a NETZSCH DSC 204 F1 instrument. Foremost the thermal capacity of unprocessed sample (after drying) was measured, and then the same sample was measured repeatedly. The loss of sample weight (water) at the first pass was ~10 %, at the second – ~0.2 %. Two peaks were observed at the temperature dependences of thermal capacities. The peaks are fixed at *T* ≈ 380 K (*cp* ≈ 6.5 J/(g K)) and *T* ≈ 480 K (*cp* ≈ 3.0 J/(g K)) in the first pass, and at *T* ≈ 370 K (*cp* ≈ 4.6 J/(g K)) and *T* ≈ 470 K (*cp* ≈ 2.7 J/(g K)) in the second pass. The deviations of thermal capacities curve indicative of water in samples. The peak temperatures of thermal capacities coordinate with temperatures of parameter changes of vermiculite structure. The values of capacities measured during the first and the second passes at room temperature are rather small and equal 1.2 – 1.3 J/(g K). The thermal capacity is almost constant (1.3 – 1.4 J/(g K)) during the first pass and monotonously changes from 1.4 up to 1.7 J/(g K) at temperature range 520 – 900 K.

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