INVESTIGATION OF THERMAL PROPERTIES OF THE PLEXIGLASS ON THE APPARATUS TAU-5

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Apparatus TAU-5 is designed to measure the thermal conductivity and temperature conductivity of solid samples (with an error of 2 % and 5-8 %, respectively) in the temperature range from 80 to 360 K by absolute non-stationary method of a heated circle [1-4]. The method is based on heating by a known heat flux from a thin circular sensor placed between two samples from the test material or between a sample from the test material and a sample from a material with known properties. By recording the dependence of the sensor temperature versus time when it is heated by direct current, information about the thermal properties of the material is obtained. Automatic mode of measurement and subsequent calculation of the recorded results are provided by computer-measuring system "AKSAMIT-6.13" and software. Apparatus TAU-5 was certified as the State working standard of the unit of thermal conductivity of the 2-nd category in the range of 0.02-15 W/m/K. Plexiglass in a symmetrical version was studied at TAU-5, as the most common and reliable material for the standard samples of 3-rd category. The investigation showed hysteresis in the measurement results of the thermal conductivity of the plexiglass. Above 200 K the plexiglass exhibit higher thermal conductivity when the sample is heated than when it is cooled. The discrepancy comes up to 2 %, which is comparable with the error of the standard samples of the 3-rd category 3 %.

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