METHOD FOR INVESTIGATION OF THERMAL CONDUCTIVITY OF METAL MATERIALS AT ACTION OF ULTRASONIC OSCILLATIONS

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The investigation of the thermal conductivity in the field of action of ultrasonic oscillations is a new and complex problem and the solution of this problem is of current importance for ultrasonic equipment operating at elevated temperatures in various technological processes used in power engineering and industry. The technological processes intensified by ultrasonic oscillations in the gaseous medium are included combustion processes, gasification of solid fuels, processes of mass exchange and coagulation of aerosols, cleaning of flue gases and others. In this paper we propose the method for nonstationary investigation of the thermal conductivity in the field of ultrasonic waves at a frequency 20 kHz. A device for determining these characteristics has been developed, which is a design with an ultrasonic transducer and a rod-shaped waveguide. A thermograph was used for investigation of the nonstationary thermal state of a conical rod and contactless measurements of its surface temperatures. The investigations of the heating curves of the tip of the conical rod and the time of heat transfer from the electric heater to the tip of the rod in experiments with an ultrasonic transducer turned on and without it were carried out. According to the results of the research it was obtained that the thermal conductivity of a metal rod made of carbon steel is increased by 1.5 times.