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The research of piezoelectric transducers for ultrasonic medical systems

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Piezoelectric transducers are widely used in the medical systems, special permanently in ultrasonic inhalation devices for spraying of drugs for the treatment of upper respiratory tract and lungs. The devices are simple enough, convenient and reliable in operation.

It was developed a research installation for the research and parameters optimization of piezoelectric transducers that can be used as nebulizers, and aerosol cloud formation from an aqueous solution of drugs. Research installation is shown in Figure 1, where *G* is a generator, *PHz* is a frequency meter, *V* is a voltmeter, *1* and *2* are top electrodes, *1'* is a bottom (ground) electrode.

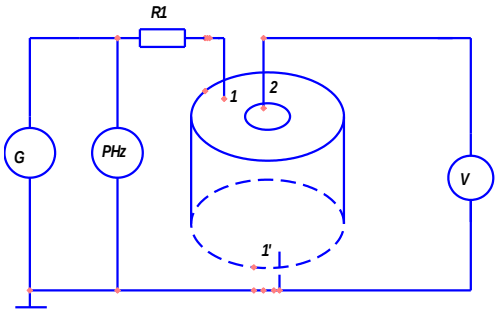

Figure 1 – Research installation for investigation of piezoelectric transducers for ultrasonic medical devices

For the research were used piezoelectric transducers made from the following materials: TSTS-19 (sample 1: ∅66 mm and a thickness of 3 mm; sample 2: ∅25 mm and a thickness of 1 mm), TSTBS-3 (∅50 mm and a thickness of 1.2 mm) and electroacoustic transducer ZP-19.

The amplitude-frequency characteristics for four types of transducers were measured in a transformer mode.

It was defined that sample 2 is the most suitable for use in ultrasonic inhalation devices for spraying, and its operating frequency was measured as 1.66MHz.