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(Research Article)
Design and fabrication of an ultrasonic thermoacoustic generator using metal nanocoatings

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Abstract

In this paper, we design, simulate, and build an ultrasonic heat generator. In thermoacoustics, heat generated by the passage of alternating current through a thin conductor produces a sound wave. In this method, unlike other methods of sound production, moving parts are not used to vibrate air molecules, and as a result, the frequency response of these generators is flatter than other sound generators and they are used in a wider range. In this study, samples of sound generators were made using different conductive materials and different structures and measured in the laboratory. The study aimed to construct an ultrasonic generator with a wide and flat frequency response in the frequency range of 50 to 90 kHz. The results obtained from the measurements show the ability to produce sound with a sound pressure level of 90 decibels at frequencies of 40 to 90 kHz and suitable stability for long operation.

Keywords: Acoustics, Thermoacoustics, Heat, Sound generation.

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