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Interaction of electric and acoustic vibrations in combustion

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Abstract

The results of experimental studies of the interaction of electrical discharges in the acoustic oscillations in the combustion of isobutane are presented in the article. Electric discharges were created using a pulsed high voltage source at specified intervals. The purpose of the study was to determine the feasibility of using electrical pulse action to control combustion. The study was conducted on the specifically designed pattern of the combustion chamber with a swirl burner in the frequency range from 100 Hz to 1400 Hz. The study found that the method of periodic pulsed electrical influences can be used to control the combustion in the combustion chamber model. There is a steady increase in the amplitude of the oscillations in the combustion chamber model. Effects due to the mechanism of interaction of acoustic waves and oscillations heat release from the combustion zone. Estimated physical mechanism is a periodic change in the concentration of ions in the interaction of the combustion zone with the electric field of high potential. The proposed control method is advantageous in terms of energy costs.

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