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**Combustion of Gasless Systems with a Variable
Porosity and an External Gas Exchange**

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ABSTRACT

The investigation of stationary and self-oscillatory combustion regimes in gasless systems with an external gas exchange is based on a two-temperature and two-velocity model of gasless combustion accounting for structural transformations caused by an in-pore forced gas infiltration, liquid-phase sintering, and bulk alteration of the condensed phase during chemical conversions. It has been shown that structural transformations exert a strong effect on the character and regularities of the combustion front propagation. The main structural parameters affecting the synthesis wave structure, velocity, and stability are the initial sample porosity, diameter, and the particle size. The results of numerical calculations are compared to the available experimental data.

Keywords: mathematical simulation, gasless combustion, structural transformation, stationary and self-oscillatory combustion.