FEATURES OF SPIN COMBUSTION OF GASLESS SYSTEMS

K. L. Klimenok[1] and S. A. Rashkovkiy[2,3]

[1] Moscow Institute of Physics and Technology, Dolgoprudny, Moscow Region, Russian Federation
[2] Institute for Problems in Mechanics, Russian Academy of Sciences, Moscow, Russian Federation
[3] N. N. Semenov Institute of Chemical Physics, Russian Academy of Sciences, 4 Kosygin Str., Moscow 119991, Russian Federation

Abstract: A discrete model of gasless combustion of a cylindrical sample which reproduces in details a spin combustion mode has been proposed. It is shown that a spin combustion in its classical sense as a continuous spiral motion of heat release zones on the surface of the sample does not exist. This study shows that in fact a spin-like combustion is realized, at which two energy release zones are appeared on the lateral surface of the sample and propagated circumferentially in the opposite directions. After some time, two new heat-release zones are formed on the next layer of cylinder surface and commit the same countercircular motion. The model shows that approaching the combustion limit, the process becomes more complicated and spin-like combustion mode shifts to a more complex mode with multiple zones of heat-release moving in different directions along the lateral surface.

Keywords: spin combustion; gasless combustion; bifurcations; numerical simulation

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Contributors

Klimenok Kirill L. (b. 1991) — Ph.D. student, Moscow Institute of Physics and Technology, Dolgoprudny, Moscow Region, Russian Federation; lordsam@yandex.ru

Rashkovskiy Sergey A. (b. 1957) — Doctor of Science in physics and mathematics, leading research scientist, Institute for Problems in Mechanics, Russian Academy of Sciences, 101-1 Vernadskogo Prosp., Moscow 119526, Russian Federation; leading research scientist, N. N. Semenov Institute of Chemical Physics, Russian Academy of Sciences, 4 Kosygin Str., Moscow 119991, Russian Federation; rash@hotbox.ru