

# COMBUSTION AND EXPLOSION [GORENIE I VZRYV (MOSKVA)]

Vol. 10 No. 3 Year 2017

Editor-in-Chief S. M. Frolov

## In this issue:

Investigation of flame front shape in a swirling turbulent flow by planar laser-induced fluorescence of formaldehyde L. M. Chikishev, V. M. Dulin, A. S. Lobasov, and D. M. Markovich . . . . .	4
Effect of steam on the dynamics of NO formation during CH <sub>4</sub> combustion in the perfectly stirred and plug flow reactors G. A. Poskrebyshev, A. N. Ermakov, I. A. Korobeinikova, and V. N. Popov . . . . .	10
Numerical simulation of soot emission reduction at a DI Diesel engine G. L. Agafonov, P. A. Vlasov, and O. B. Ryabikov . . . . .	15
An effective burning device V. M. Nikolaev and V. M. Shmelev . . . . .	22
Firing tests of the ramjet model with the detonative combustion of hydrogen in a wind tunnel at approach air stream Mach number from 5 to 8 S. M. Frolov, V. I. Zvegintsev, V. S. Ivanov, V. S. Aksenov, I. O. Shamshin, D. A. Vnuchkov, D. G. Nalivaichenko, A. A. Berlin, and V. M. Fomin . . . . .	26
Flameless burning of large <i>n</i> -dodecane drops in microgravity conditions S. M. Frolov, V. Ya. Basevich, S. N. Medvedev, and F. S. Frolov . . . . .	36
Tests of the pulsed-detonation ramjet model in a free air jet with Mach number up to 0.85 S. M. Frolov, V. S. Ivanov, I. O. Shamshin, and V. S. Aksenov . . . . .	43
Some numerical aspects of the modeling of the shock wave – particles cloud interaction using two-fluid model P. S. Utkin . . . . .	53
Propagation of a heterogeneous detonation wave in a channel with expansion A. V. Fedorov, T. A. Khmel, and S. A. Lavruk . . . . .	58
Two-dimensional model of fingering instability in smolder combustion of thin solid fuel in air flow S. A. Rashkovskiy . . . . .	64
Combustion mechanism of potassium dinitramide and its binary mixtures with nitroester binder V. P. Sinditskii, A. N. Chernyi, D. S. Shmelev, V. Yu. Egorshev, S. A. Filatov, A. A. Matveev, and Yu. M. Milekhin . . . . .	70
Heating and ignition of HNIW by continuous near-infrared lasers L. V. Bachurin, V. I. Kolesov, A. N. Kononov, V. A. Ul'yanov, and N. V. Yudin . . . . .	76
On low-velocity detonation of porous energetic materials B. S. Ermolaev and A. A. Sulimov . . . . .	82
Cerium fluorides: Influence on boron oxidation and new method of synthesis A. A. Rogozina, G. P. Kuznetsov, D. S. Shmelev, I. A. Zhidkova, I. V. Kushnarenko, I. G. Assovskiy, L. Y. Kashporov, and M. N. Brekhovskikh . . . . .	97
Electrostatic model of crystal structure of tetrazinotetrazintetroxide benzene solvate A. V. Dzyabchenko, D. V. Khakimov, and T. S. Pivina . . . . .	104
Molecular dynamics simulation of shock compression of RDX single crystal using a modified reactive force field ReaxFF-1g S. A. Kozlova, S. A. Gubin, Yu. A. Bogdanova, I. V. Maklashova, and A. A. Selezenev . . . . .	109
Method of direct measurements of obstacle impact parameters at underwater explosion of nonideal aluminized explosives P. V. Komissarov, G. N. Sokolov, V. V. Lavrov, and A. V. Savchenko . . . . .	114