STANDARD PARAMETERS CALCULATION IN EXPERIMENTAL INVESTIGATIONS OF CHARACTERISTIC FEATURES OF IGNITION AND COMBUSTION OF BORON-CONTAINING COMBUSTIBLE PARTICLES CONGLEMERATES

R.S. Ryazanov yanemal@rambler.ru
N.V. Sumnitel'nyy nik4ok@gmail.com

Bauman Moscow State Technical University, Moscow, Russian Federation

Abstract

A methodology has been developed for calculating the basic standard parameters of a hot gas generator for studying the processes of ignition and combustion of boron-containing combustible particles conglomerates in combustion products of methane-air flames. We obtained the calculated conditions of the parameters providing the tuning of the laboratory facility for carrying out experimental studies of the characteristics of ignition and combustion of aluminum polyboride particles conglomerates depending on the temperature and velocity of the flowing gas

Keywords

Conglomerate, Bunsen burner, mass flow, oxidizer excess ratio, check valve, flame flow rate

References

[1] Yagodnikov D.A., Burkal'tsev V.A., Novikov A.V. Mathematical model and calculation of the characteristics of the working process in the combustion chamber LRE of small thrust on the components of the fuel methane-oxygen. *Vestnik MGTU im. N.E.Baumana. Ser. Mashinostroenie* [Herald of the Bauman Moscow State Technical University. Ser. Mechanical Engineering], 2004, spec. iss. Teoriya i praktika sovremennogo raketnogo dvigatelestroeniya, pp. 8–17 (in Russ.).

[2] Trusov B.G. Simulation of Kinetics of Chemical Conversions: Thermodynamic Approach. *Vestnik MGTU im. N.E. Baumana. Ser. Estestvennye nauki* [Herald of the Bauman Moscow State Technical University. Ser. Natural Sciences], 2005, no. 3, pp. 26–38 (in Russ.).

[3] Isaev S.I. Kurs khimicheskoy termodinamiki [The rate of chemical thermodynamics]. Moscow, Mashinostroenie Publ., 1975. 256 p. (in Russ.).

[4] Bashta T.M. Mashinostroitel'naya gidravlika [Engineering hydraulics]. Moscow, Mashinostroenie Publ., 1971. 672 p. (in Russ.).

[5] Yagodnikov D.A. Zhidkostnye raketnye dvigateli [Liquid-propellant rocket engines]. Moscow, Bauman MSTU Publ., 2016. 461 p. (in Russ.).

[6] Grigor'ev I.S., Meylikhov E.S. Fizicheskie velichiny: spravochnik [Physical quantities: reference book]. Moscow, Energoatomizdat Publ., 1991. 1232 p. (in Russ.).

Ryazanov R.S. — student of Rocket Engines Department, Bauman Moscow State Technical University, Moscow, Russian Federation.

Sumnitel'nyy N.V. — student of Rocket Engines Department, Bauman Moscow State Technical University, Moscow, Russian Federation.

Scientific advisor — D.A. Yagodnikov, Dr. Sc. (Eng.), Professor, Head of Rocket Engines Department, Bauman Moscow State Technical University, Moscow, Russian Federation.