

COMBUSTION OF POROUS SAMPLES OF NANOSIZED ALUMINUM IN AIR AT ATMOSPHERIC PRESSURE

E. M. Popenko¹, A. A. Gromov^{2,3}, K. A. Monogarov², N. V. Muravyev², and A. A. Bragin²

¹Biysk Technological Institute, Branch of Polzunov Altai State Technical University, 27 Trofimov Str., Biysk 659305, Russian Federation

²N. N. Semenov Institute of Chemical Physics, Russian Academy of Sciences, 4 Kosygin Str., Moscow 119991, Russian Federation

³Tomsk Polytechnic University, 30 Lenin Av., Tomsk 634050, Russian Federation

Abstract: The influence of porosity of the pressed samples of electroexplosion aluminum nanopowders on the temperature-kinetic characteristics of the process of their combustion in air at atmospheric pressure was studied. The combustion process of the pressed samples occurred in two stages, the same as for nonpressed powder. The duration of the first stage is approximately equal to the second one. The burning wave propagated through the surface of the sample and then inside the sample. It is shown that the temperature boundary between low- and high-temperature stages is the temperature corresponding to the melting point of aluminum. Mainly, nitrogen binding from the air with the predominant formation of AlN in the combustion products occurs by the burning of the pressed samples of electroexplosion aluminum nanopowders.

Keywords: nanopowders; combustion of aluminum; aluminum nitride

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Contributors

Popenko Elena M. (b. 1959) — Candidate of Science in chemistry, professor, Biysk Technological Institute, Branch of Polzunov Altai State Technical University, 27 Trofimov

Str., Biysk 659305, Russian Federation; emp@bti.secna.ru

Gromov Alexander A. (b. 1975) — Doctor of Science in technology, research scientist, N. N. Semenov Institute of Chemical Physics, Russian Academy of Sciences, 4 Kosygin Str., Moscow 119991, Russian Federation; Tomsk Polytechnic University, 30 Lenin Av., Tomsk 634050, Russian Federation; alexandergromov1@gmail.com

Monogarov Konstantin A. (b. 1982) — senior research scientist, N. N. Semenov Institute of Chemical Physics, Russian Academy of Sciences, 4 Kosygin Str., Moscow 119991, Russian Federation; kostyk3d@mail.ru

Muravyev Nikita V. (b. 1985) — Candidate of Science in technology, senior research scientist, N. N. Semenov Institute of Chemical Physics, Russian Academy of Sciences, 4 Kosygin Str., Moscow 119991, Russian Federation; muravyev-nikita@ya.ru

Bragin Anatoliy A. (b. 1988) — junior research scientist, N. N. Semenov Institute of Chemical Physics, Russian Academy of Sciences, 4 Kosygin Str., Moscow 119991, Russian Federation; anatoliybragin@gmail.com