

INITIATION OF DETONATION IN HETEROGENEOUS MIXTURES IN A SMALL-SIZE TUBE AT RISING TEMPERATURES

M. S. Assad, O. G. Penyazkov, and K. L. Sevruck

A. V. Luikov Heat and Mass Transfer Institute, National Academy of Sciences of Republic of Belarus, 15 P. Brovki Str., Minsk 220072, Republic of Belarus

Abstract: In the present work, the influence of heating of a pulsed detonation combustor on the detonation initiation in heterogeneous liquid fuel/gaseous oxidizer mixtures is studied experimentally. It is shown that with the increase in tube temperature, the place of deflagration-to-detonation transition moves closer to the ignition source (to tube heading). Thus, in oxygen-diluted heptane/air mixtures, the predetonation distance is reduced by a factor of 2–3 whereas the maximum of the wave velocity increases by about 20%.

Keywords: detonation; heterogeneous system; wave velocity; initial temperature; pulsed detonation combustor

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Contributors

Assad Mohamad S. (b. 1962) — Doctor of Science in technology, leading research scientist, A. V. Luikov Heat and Mass Transfer Institute, National Academy of Sciences of Republic of Belarus, 15 P. Brovki Str., Minsk 220072, Republic of Belarus; assad@hmti.ac.by

Penyazkov Oleg G. (b. 1961) — Academician of National Academy of Sciences of Republic of Belarus, Doctor of Science in physics and mathematics, director, A. V. Luikov Heat and Mass Transfer Institute, National Academy of Sciences of Republic of Belarus, 15 P. Brovki Str., Minsk 220072, Republic of Belarus; Penyaz@dnp.itmo.by

Sevrouk Kirill L. (b. 1976) — research scientist, laboratory of physical-chemical hydrodynamics, A. V. Luikov Heat and Mass Transfer Institute, National Academy of Sciences of Republic of Belarus, 15 P. Brovki Str., Minsk 220072, Republic of Belarus; sevrouk@hmti.ac.by