COMBUSTION MECHANISM AND THERMAL DECOMPOSITION OF 4,9-BIS(TRINITROMETHYL)-1,2,4-TRIAZOLO[3,4-d]-1,2,4-TRIAZOLO[3,4-f]-FURAZANO[3,4-b]PYRAZINE

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Abstract: Combustion mechanism and thermal decomposition of 4,9-bis(trinitromethyl)-1,2,4-triazolo[3,4-d]-1,2,4-triazolo[3,4-f]-furazano[3,4-b]pyrazine, which may have potential use as explosive and propellant ingredient, have been studied. Analysis of the gaseous and condensed decomposition products of the studied compound showed that the trinitromethyl groups are decomposed at the initial stage. At temperatures of 100–120 °C, the decomposition stops at intermediate formation of anhydride of carboxylic acid. Thermocouple-aided measurements allowed to determine the vapor pressure and the vaporization heat. In spite of the high combustion temperature, combustion of the tested compound has been shown to obey the mechanism with the leading reaction in the condensed phase, which is due to the high rates of heat release in the molten phase.

Keywords: combustion; thermal decomposition; 4,9-bis(trinitromethyl)-1,2,4-triazolo[3,4-d]-1,2,4-triazolo[3,4-f]-furazano[3,4-b]pyrazine

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