INVESTIGATION OF HYDRAZINIUM DINITRAMIDE COMBUSTION

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Abstract: Combustion properties of hydrazinium dinitramide (HDN) were experimentally evaluated. This innovative energetic ingredient of composite solid propellants demonstrates extremely high level of burning rate up to 160 mm/s at 100 atm with the pressure index of 0.77. In typical solid propellant compositions, HDN particles decompose in temperature range 150–200°C and burn out mostly independently without essential chemical interaction with "passive" binders and other components. Hydrazinium dinitramide can be used for increasing the composite propellants burning rate. For instance, in experiment, partial change of ammonium dinitramide on HDN has allowed the velocities of the propellant combustion at 100 atm to reach 100 mm/s with the pressure index equal to 0.4. Unfortunately, HDN has an unacceptable level of shock and friction sensitivity 2–3 times higher than that of HMX.

Keywords: combustion; hydrazinium dinitramide

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