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IGNITION-DELAY MEASUREMENT FOR DROP TEST WITH GREEN HYPERGOLIC
PROPELLANTS**Abstract**

Since the early 2000s, studies for finding green hypergolic propellants have been extensively performed because of concerns regarding the toxicity of the conventional hypergolic combinations. The hypergolicity of green hypergolic propellants must be evaluated at the early stage of their development. Drop-test experiments have been widely utilized to evaluate the hypergolicity because of their simplicity. Although abundant experimental data on hypergolicity for green hypergolic propellants are available, there is no criterion to evaluate the ignition delay through a drop test. This appears to be an unavoidable situation, because it is difficult to standardize drop-test conditions. For instance, the ignition-delay(ID) of a hypergolic propellant can change depending on the test conditions, such as the droplet size, impact velocity of the droplet, and oxidizer-to-fuel mass (or volume) ratio. However, it is possible to establish an experimental methodology for the measurement of the ignition delay of hypergolic propellants. In the present study, we attempted to establish an experimental methodology for reliably measuring ignition delays with various hypergolic combinations via drop tests. Hydrogen peroxide (90 wt.