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TOWARDS NEW HYPERGOLIC HYDROGEN PEROXIDE-BASED BIPROPELLANTS

Abstract

Hydrogen peroxide in combination with hydrocarbons, alcohols, or amines can be considered an attractive solution for the development of storable bipropellant candidates replacing hydrazine. The non-hypergolic nature of these couples imposes the use of a mechanism of ignition, though. This raises concerns of reliability when multiple firings are planned.

A modified fuel composition, demonstrating hypergolic ignition capability with hydrogen peroxide, has been recently tested at the SPLab. The fuel is based on ethanolamine, ethanol and a copper-based additive. The experimental test campaign has demonstrated the efficacy of the ignition process, granting an ignition delay time down to 34 ms, even with a hydrogen peroxide concentration around 87%. A long-term stability of the fuel-additive combination has been also proved. A parametric analysis on additive concentration and fuel combination will be presented.