

66th International Astronautical Congress 2015

SPACE PROPULSION SYMPOSIUM (C4)  
Propulsion System (1) (1)

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A NOVEL GREEN GEL PROPELLANT BASED PROPULSION SYSTEM

**Abstract**

Gel-propellant rocket engines are combining the best of both solid and liquid rockets; they are safe and simple to use while featuring high performance and controllability. In addition, the colloid character of gels allows suspension of various particles that can increase the energetic performance.

In the frame of the present study, a novel propulsion system for space applications has been developed. The engine is based on non-toxic, hypergolic gel propellant. The various engine types are capable to operate in pulses and can produce different thrust levels starting from 1 N going up to kNs. The ignition delay is similar to hydrazine-based hypergolic propellants. The nature of the gel allows the addition of metal particles, which can achieve high levels of specific impulse.

The propulsion system can be used as an upper-stage motor and also for satellite trajectory modifications.

A demonstrator has been designed and built. Several successful static firings have been conducted. The results will be presented in the final paper.