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Green Chemical Space Propulsion

By Markus Schiebl

AV Akademikerverlag Feb 2015, 2015. Taschenbuch. Book Condition: Neu. 221x149x20 mm. This item is printed on demand - Print on Demand Neuware - Currently used propellants for mono- and bipropellant systems such as hydrazine, NTO, and MMH are highly toxic and therefore expensive to be implemented. So-called green propellants have drawn increasing interest in times with decreasing budgets for space missions and development tasks. They are promising a significant reduction of the overall development and operational costs at similar or better performance. FOTEC GmbH has developed a one Newton bipropellant thruster system operating exclusively with green propellants under contract of the European Space Agency. One of the main properties to be investigated was the ignition capability and ignition conditions of such new propellants. For the investigated system hydrogen peroxide (87 wt%) was used as oxidizer. Kerosene was selected as fuel and their suitability was investigated for such a propulsion system. Their auto ignition capability (quasi-hypergolicity) in the presence of decomposed hydrogen peroxide (i.e. steam and oxygen) has been investigated experimentally. An analytical non adiabatic auto ignition model of the ignition conditions for a choked and non-choked flow in a micro rocket combustion chamber has been developed assuming a one-step single...



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