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DESIGN AND PERFORMANCE EVALUATION OF LAB-SCALE HYBRID THRUSTER USING
CATALYTICALLY DECOMPOSED HYDROGEN PEROXIDE OXIDIZER**Abstract**

Hydrogen peroxide has long been used as the rocket propellant and oxidizer. It is safe, easy to obtain, and environment friendly. Hydrogen peroxide is catalytically decomposed into water vapor and oxygen, releasing massive amount of heat. This heat can be used to ignite the solid grain in hybrid rocket. Hybrid rocket has better performance than solid motor, and restartable. Compared to liquid bipropellant rocket, hybrid rocket is easy to construct and cost effective. In this research, design of 80 N scale and 250 N scale up hybrid thruster was conducted and ground experiments were done. 90250 N hybrid engine was designed based on the result of previous experiments. Thruster using polyethylene fuel grain is designed. Water flow test and hybrid combustion test followed. Carbon phenolic ablative nozzle was adapted to reduce the thermal stress on the thruster. Ablative nozzle was damaged during combustion experiments. Thrust and pressure dropped abruptly after nozzle damage. In two times experiments, 201.5 N and 224.7 N thrust was observed before nozzle damage. This research showed the possibility of development of tropospheric hybrid sounding rocket. Further research can be continued on design and construction of sounding rocket flight model.