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Ballistic test investigation of hybrid rocket motor utilizing stearic acid biofuel with energetic additives for regression rate enhancement

(Conference Paper) [\(Open Access\)](#)

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Abstract

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This research evaluates a novel composition based on Stearic Acid (SA) wax fuel, enriched with aluminium and carbon nanotubes (CNT) for hybrid propulsion system by carrying out a ballistic test. Benchmarking the aluminium doped hybrid fuel with the SA wax fuel, the former reveal lesser viscosity which leads to relatively improved entrainment-aided combustion. In contrast to the pure SA fuel, fine aluminium powder doped hybrid fuels show solid-like behavior, and hence greater stability in the solid phase. The loading of ultrafine aluminium powder substantially improves the efficacy of fuel regression during ballistic firing. © 2021 American Institute of Physics Inc.. All rights reserved.

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