

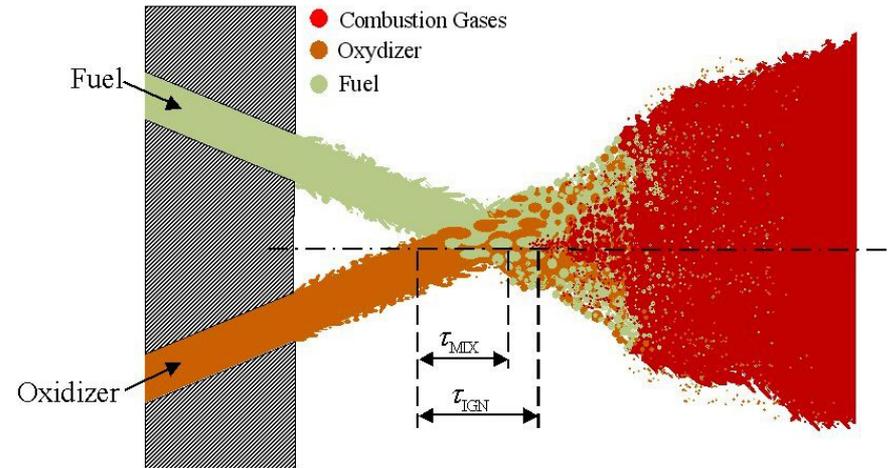
Spray and Combustion of Gelled Hypergolic Propellants for Future Rocket and Missile Engines: PI: V. Yang, Pennsylvania State University

Objective:

An integrated research program comprising material science, chemistry, physics, and engineering to address various fundamental issues critical to the development of gelled hypergolic propellant (GHP) spray and combustion technologies for future rocket and missile propulsion systems.

Scientific Challenges:

Modeling and diagnostics of multi-phase, multi-component reactive systems with a wide range of length and time scales.



Anticipated Accomplishments:

- Characterization of selected GHP properties
- Investigation of GHP jet atomization, spray formation, and droplet dynamics.
- Study of GHP interfacial reactions and transport at atomistic, molecular, micro, and meso scales
- Development of GHP reaction mechanisms
- High-fidelity modeling and simulation of fluid dynamic and combustion processes
- Single-element injector and subscale combustor testing, diagnostics, and evaluation.

Personnel: 10 PI's and 12 tasks

Army Relevance:

Address fundamental issues critical to the development of gelled hypergolic propellant spray and combustion technology.

Funding profile: FY08-FY13 \$6.25M

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