

Laminar Burning Velocity NH_3/H_2 +Air Mixtures at Elevated Temperatures and Pressures

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Abstract : Carbon-free combustion has great attention in today's research for its unlimited benefits regarding various factors, and ammonia is considered a potential carbon-free alternative gas despite its flame characteristics. The Shrestha mechanism and Chemkin-Pro software will be used for numerical data. Firstly, experimental and numerical results should show good agreement to move for studying the laminar flame speed of ammonia under various conditions. Ammonia flame speed will be investigated under normal conditions (298 K, 1 atm) as well as under the influence of a range of equivalence ratios (0.6-1.8), elevated temperatures (298,323,373,423, and 473), elevated pressures (1 atm- 70 atm) and finally at varying hydrogen content (0-100%). Therefore, this work will understand the ammonia laminar flame speed characteristics and how and to what extent hydrogen can improve ammonia combustion intensity.

Keywords : laminar burning velocity, ammonia, hydrogen, combustion

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