



WORKSHOP

Ammonia for Fueling Future Energy

Lisboa, April 13-14, 2019

PROGRAMME and ABSTRACTS

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Laminar burning velocities of premixed methane/ammonia/air flames at standard conditions

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Possible means of employing ammonia as a fuel in practical applications include the use of mixtures of ammonia and other fuels such as methane. In order to develop combustors for ammonia and its blends with other fuels, the availability of chemical kinetic mechanisms that accurately model the burning velocity of these mixtures are very relevant. In the present work, laminar burning velocities of premixed methane/ammonia/air mixtures were experimentally measured in a heat flux burner at a mixture temperature of 298 K and atmospheric pressure. Ammonia molar fraction in the fuel was varied from 0 to 0.6 while the equivalence ratio was varied from 0.7 to 1.4. The laminar burning velocity significantly decreases with increasing the percentage of ammonia in the fuel mixture with a non-linear trend that strongly depends on the equivalence ratio. A comparison of experimental and computational data using existing comprehensive detailed chemical kinetic mechanisms was also conducted and discussed. The numerical analysis showed that the recently updated kinetic mechanisms “Glarborg-2018”, “Okafor-2018” and “POLIMI-2019” satisfactorily predict the laminar burning velocity.