

Electronic Supplementary Information

**Laminar burning velocity of methyl decanoate at
atmospheric pressure: Experimental and reaction kinetics
study**

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1. Experimental Platform

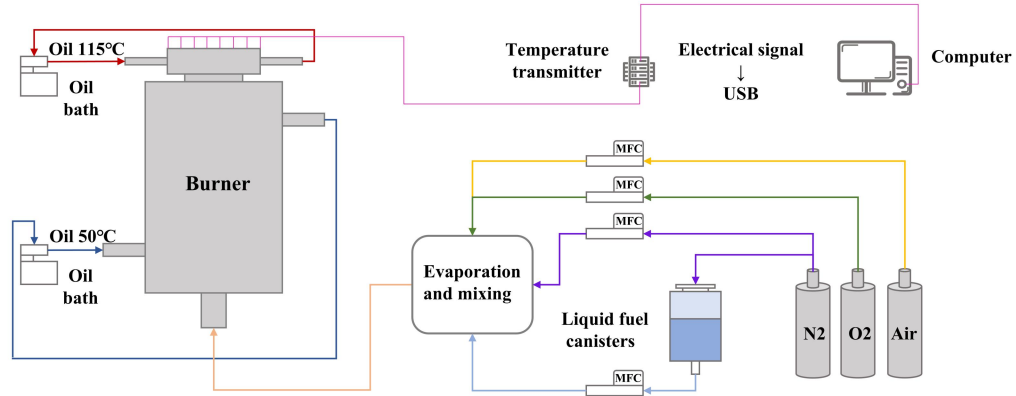


Figure 1 System diagram of the experimental platform

In this research, the laminar burning velocity of the mixed methyl decanoate /air flame under the corresponding working conditions is determined by the heat flux method. The schematic diagram of the overall experimental system is shown in Figure 1. The unburned gas mixture is controlled by a mass flow controller (MFC) of Bronkhorst & Alicat and vaporized by flowing heated nitrogen gas and then supplied to the premixed combustion chamber of the heat flux burner. The MFC is connected to the computer through the dedicated control software developed by Bronkhorst & Alicat.

2. Additional data

Detailed data on the laminar burning velocities of methyl decanoate at experimental setting conditions obtained experimentally are supplemented. Please refer to Table 1 for the data. And the planar flames in the course of the experiment are depicted in Figure 2.

Table 1 The laminar burning velocity (S_L) of methyl decanoate at $p = 1$ atm and $T = 373$ K, with the unit being cm/s.

Φ [-]	S_L [cm/s]
0.7 ± 0.0037	33.46 ± 0.89
0.8 ± 0.0037	42.55 ± 0.90
0.9 ± 0.0038	50.65 ± 1.46
1 ± 0.0040	55.78 ± 1.56
1.1 ± 0.0043	58.12 ± 2.13
1.2 ± 0.0049	53.94 ± 1.15
1.3 ± 0.0057	47.56 ± 1.15
1.4 ± 0.0073	35.29 ± 1.12
1.5 ± 0.0109	21.27 ± 1.11



Figure 2 The planar flame on the burner plate for the methyl decanoate with $\Phi = 1.0$ at 373 K and 1 atm.