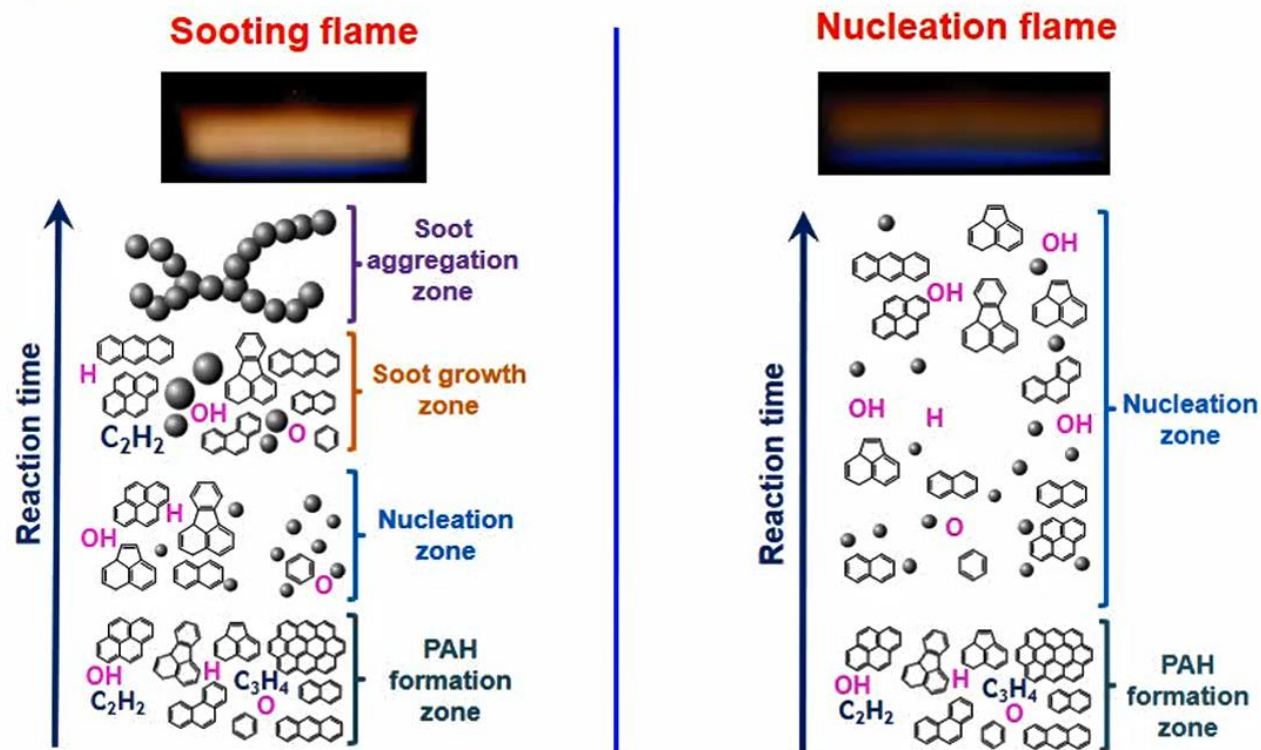


Experimental study of the influence of hydrogen as a fuel additive on the formation of soot precursors and particles in atmospheric laminar premixed flames of methane

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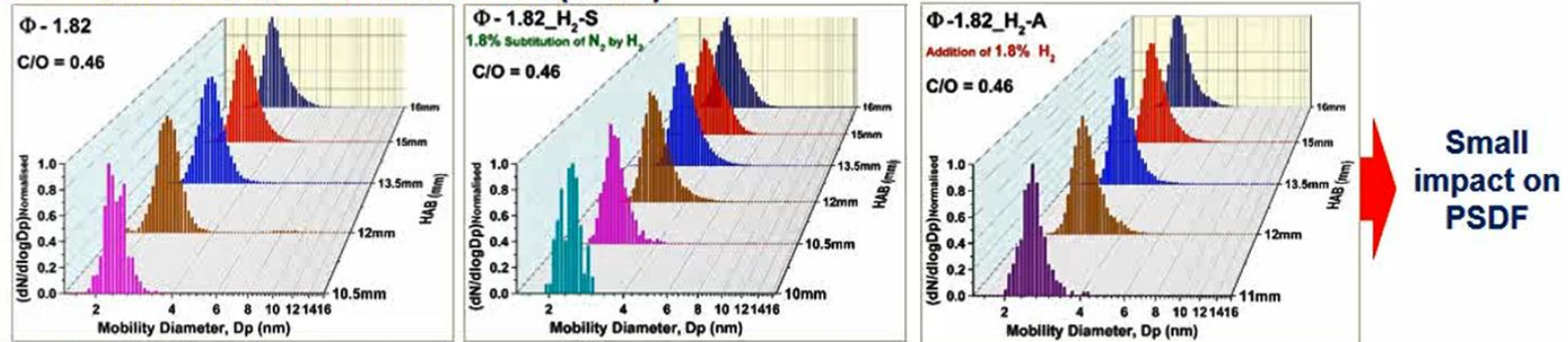
Physicochimie des Processus de Combustion et de l'Atmosphère (PC2A), CNRS UMR 8522, Université de Lille, F-59000 Lille, France

1. Soot formation in premixed flame

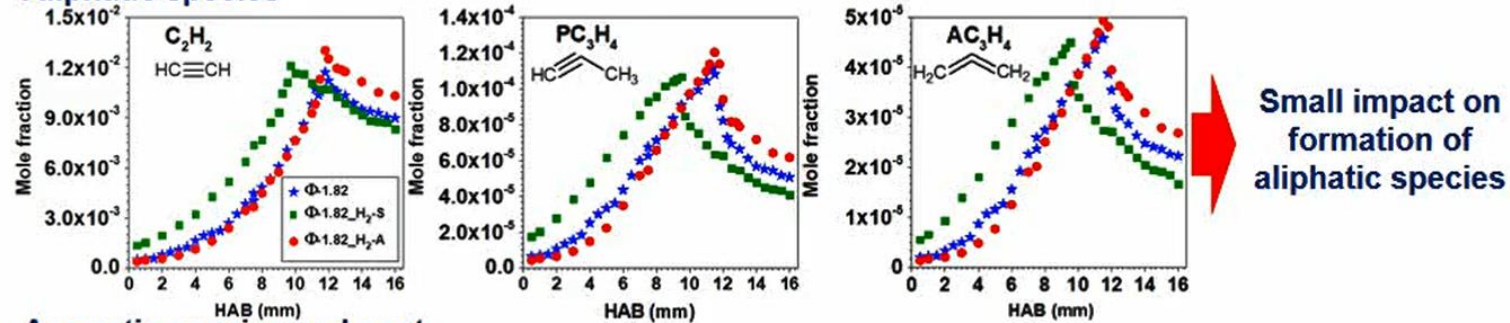


2. Results - Impact of H₂ on soot formation

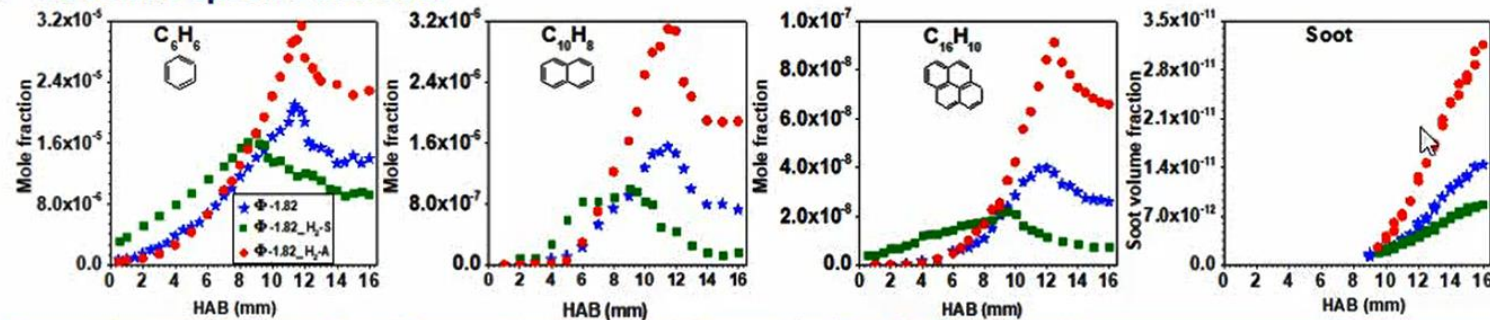
➤ Particle size distribution function (PSDF)



➤ Aliphatic species



➤ Aromatic species and soot



Aromatic species and soot formation strongly impacted by H₂ introduction
 Change of soot volume fractions profiles essentially depending on aromatic species concentrations

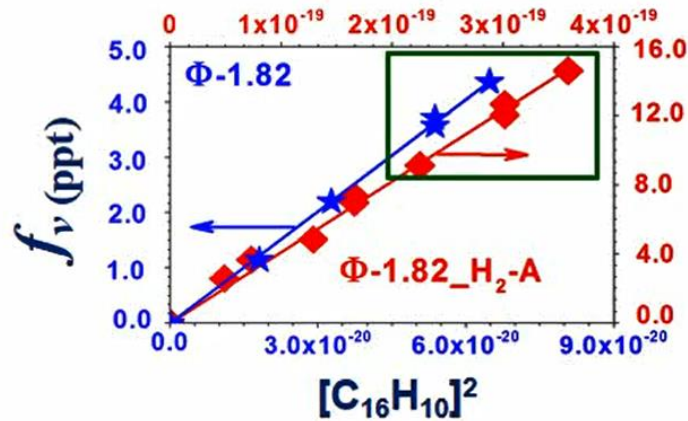
2. Results – Soot nucleation process

➤ Soot nucleation

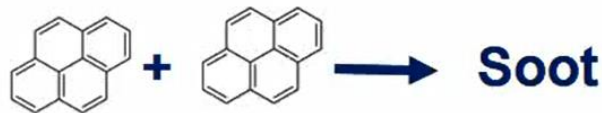
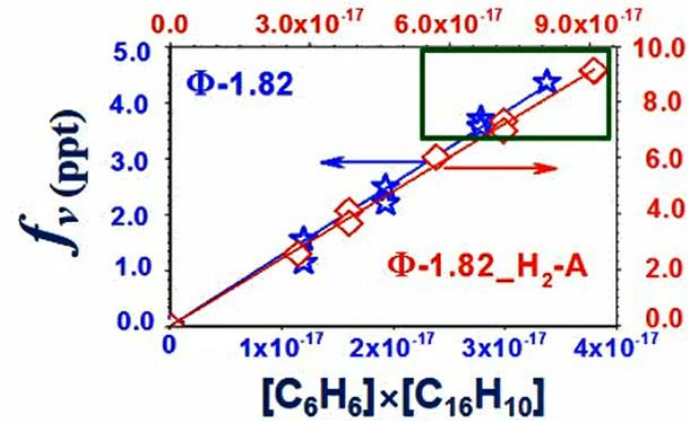


$$f_v \sim [\text{PAH}] \times [\text{PAH}]$$

Homogenous dimerization



Heterogeneous dimerization



Pyrene is a good candidate for the soot nucleation process

