Modeling of the combustion process of non-charring polymers under oxygen reduced atmospheres

Groupement de Recherche Feux 2021

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Context and Objectives

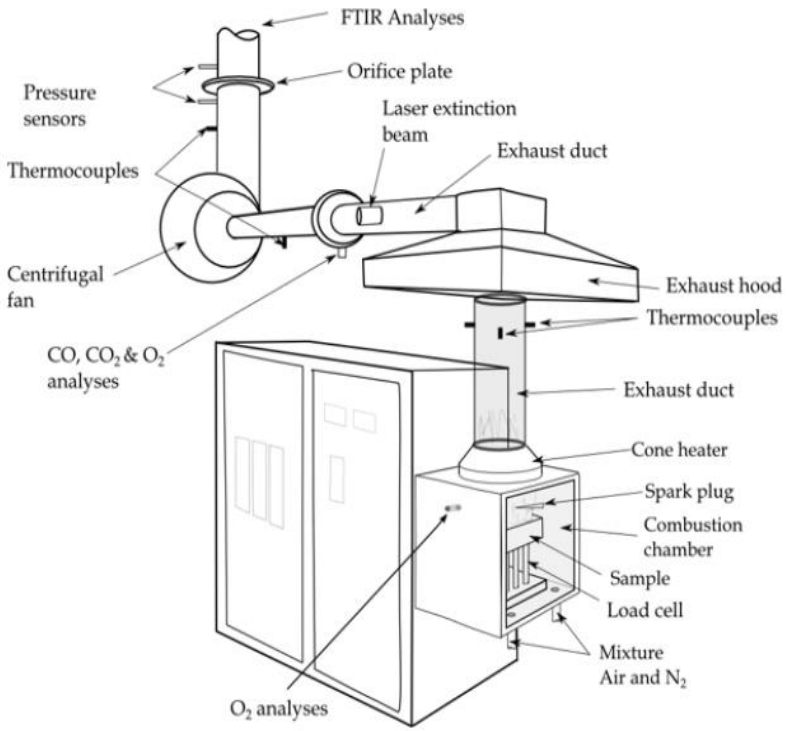
- ✓ Limited knowledge on the behavior of fire in under ventilated or confined atmospheres
- ✓ Few data available
- ✓ Unsuitable models: The models available use a rapid chemistry and therefore are not adapted for under-ventilated or confined atmospheres !

→ Inaccurate results and prediction of risks !

Objectives

- ✓ Study the problematic of fire in under-ventilated and confined spaces.
- ✓ Develop adequate numerical models to better assess the behavior of fire in those spaces.

Research Work



Controlled atmosphere cone calorimeter

Material:

- ✓ Clear PMMA, Casting

Experimentally:

- ✓ Study the Effects of irradiance level, oxygen availability and airflow
- ✓ Improve knowledge
- ✓ Have data to validate numerical model

Numerically:

- ✓ Modelling:
  - -Tests (turbulence heat exchange…)
  - -Pyrolisis
  - -Combustion regime (extinction)
- ✓ Sensibilty analysis
- ✓ Compare predictions with experimental results

Thank you!