

## Supporting information

# The Merit of Pressure Dependent Kinetic Modelling in Steam Cracking

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# 1. Experimental bench scale steam cracker setup

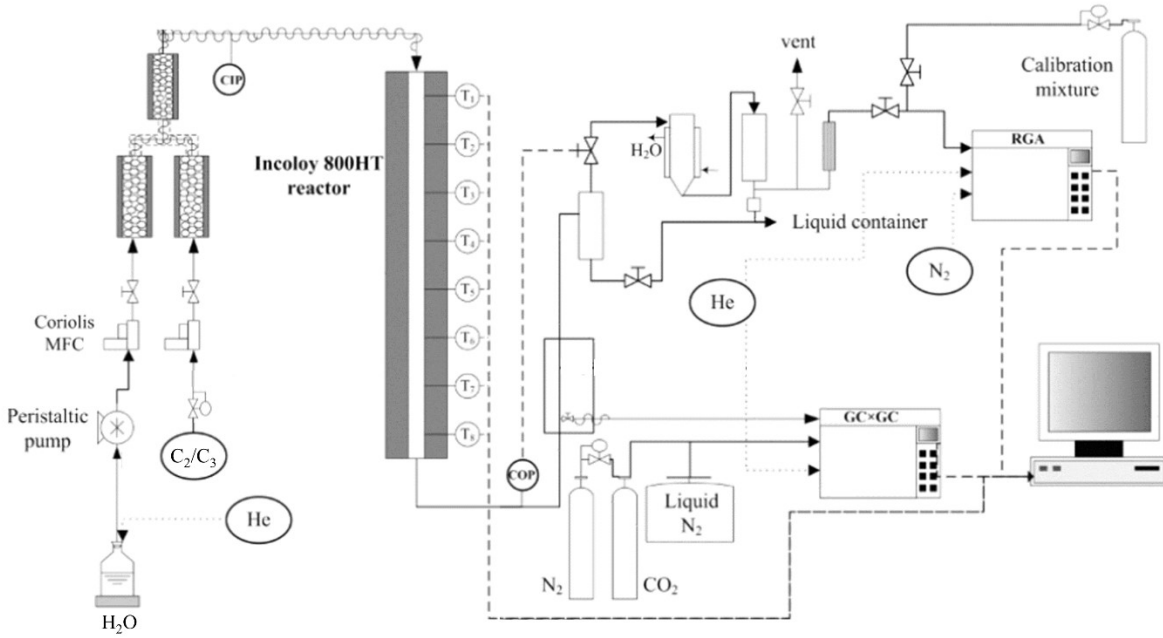


Figure 1: Schematic overview of the bench scale steam cracker.

## 2. Experimental results

The experimental data acquired for the steam cracking of ethane and propane on a bench scale steam cracker (tubular reactor) is provided as a separate Excel spreadsheet. Detailed temperature profiles are also available in this spreadsheet.

### 3. PCA using Quantis

Below one can find the data quality assessment that was performed in Quantis. Run reference numbers are referenced in the experimental data.

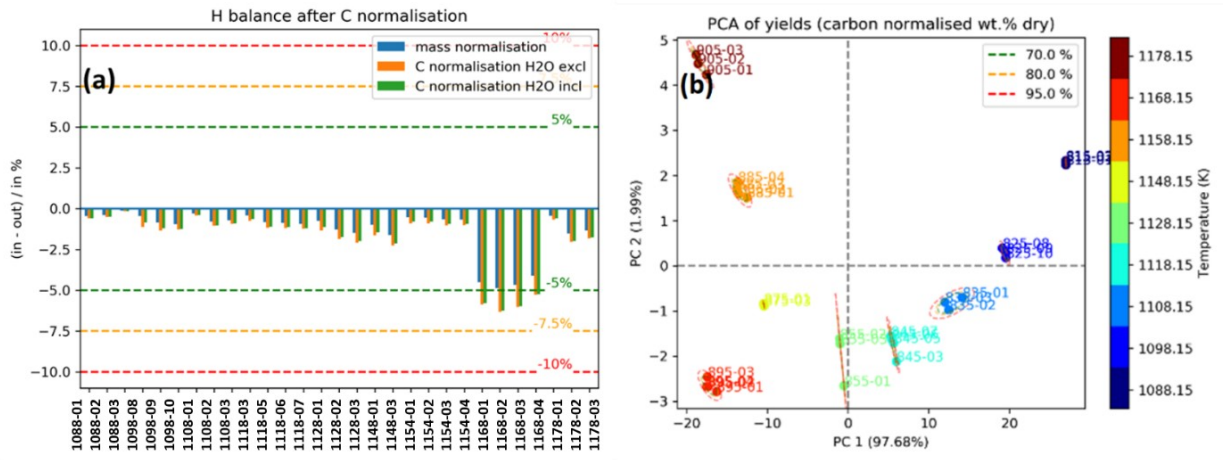


Figure 2: Data quality assessment of ethane steam cracking results: a) H balance of the experiments after carbon normalization b) PCA of carbon normalized yields of all GC injections.

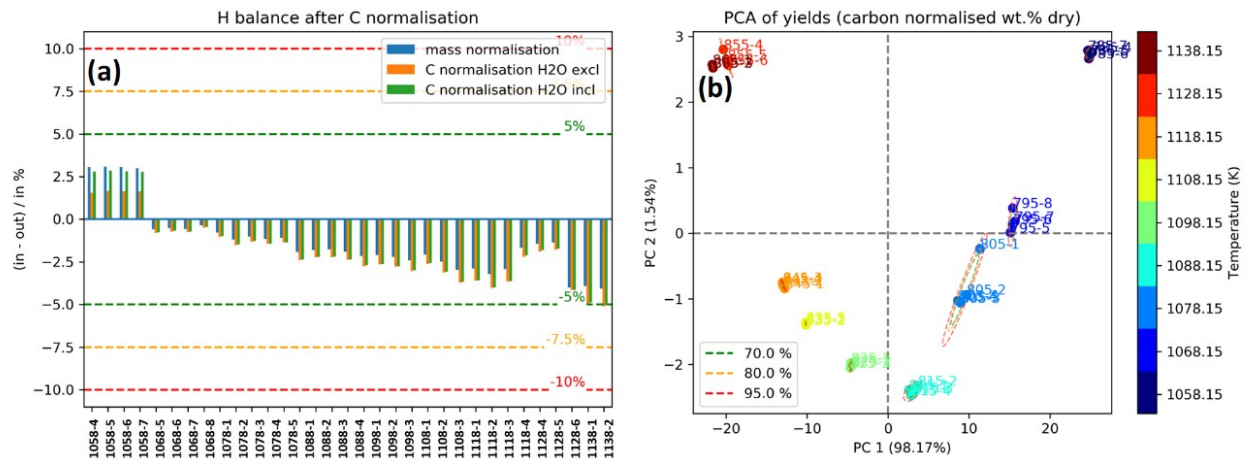


Figure 3: Data quality assessment of propane steam cracking results: a) H balance of the experiments after carbon normalization balance b) PCA of carbon normalized yields of all GC injections.

## 4. Kinetic model

The kinetic model in CHEMKIN format developed for the pyrolysis of ethane and propane is provided as a separate text file. This model corresponds to the P dep. case. Other cases can be reconstructed by disabling the P dependent parameters (TROE or PLOG format, at the end of this file) and enabling the high pressure limit that is provided.