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Catalytic Cracking of BioDiesel:

Using the FCC Process to Convert FAME into Oxygen-free Gasoline

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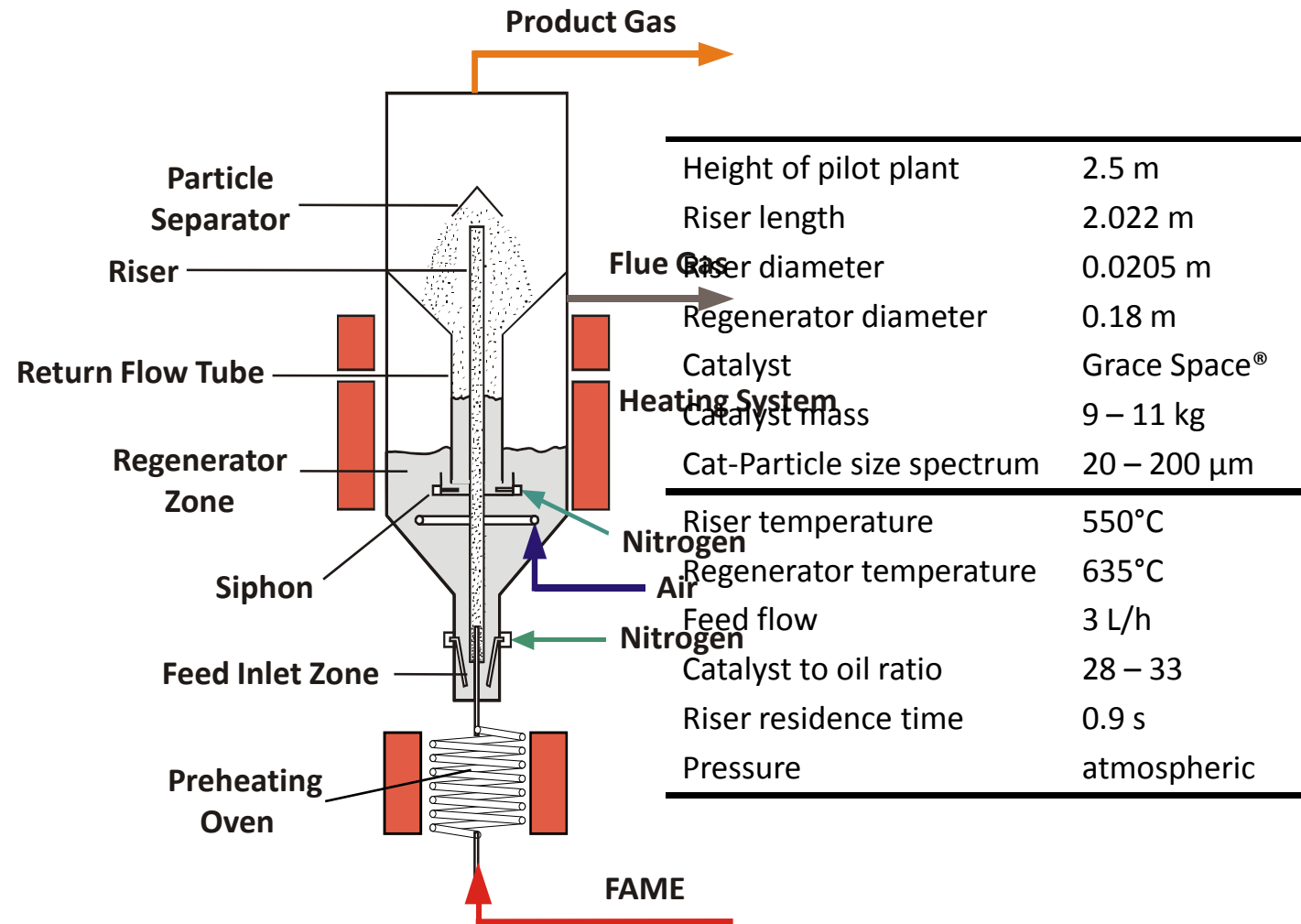
Institute of Chemical Engineering
Working Group Fluidized Bed Systems and Refinery Technology
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- Aims of the work
- The Feedstock: *Fatty Acid Methyl Ester (FAME)*
- The FCC-pilot plant
- Results of the cracking experiments

- Testing an alternative feedstock for FCC-process
- Analyzing the gaseous phase of the product (olefins)
- Comparison of the product with conventional FCC-feedstock (vacuum gas oil, VGO)

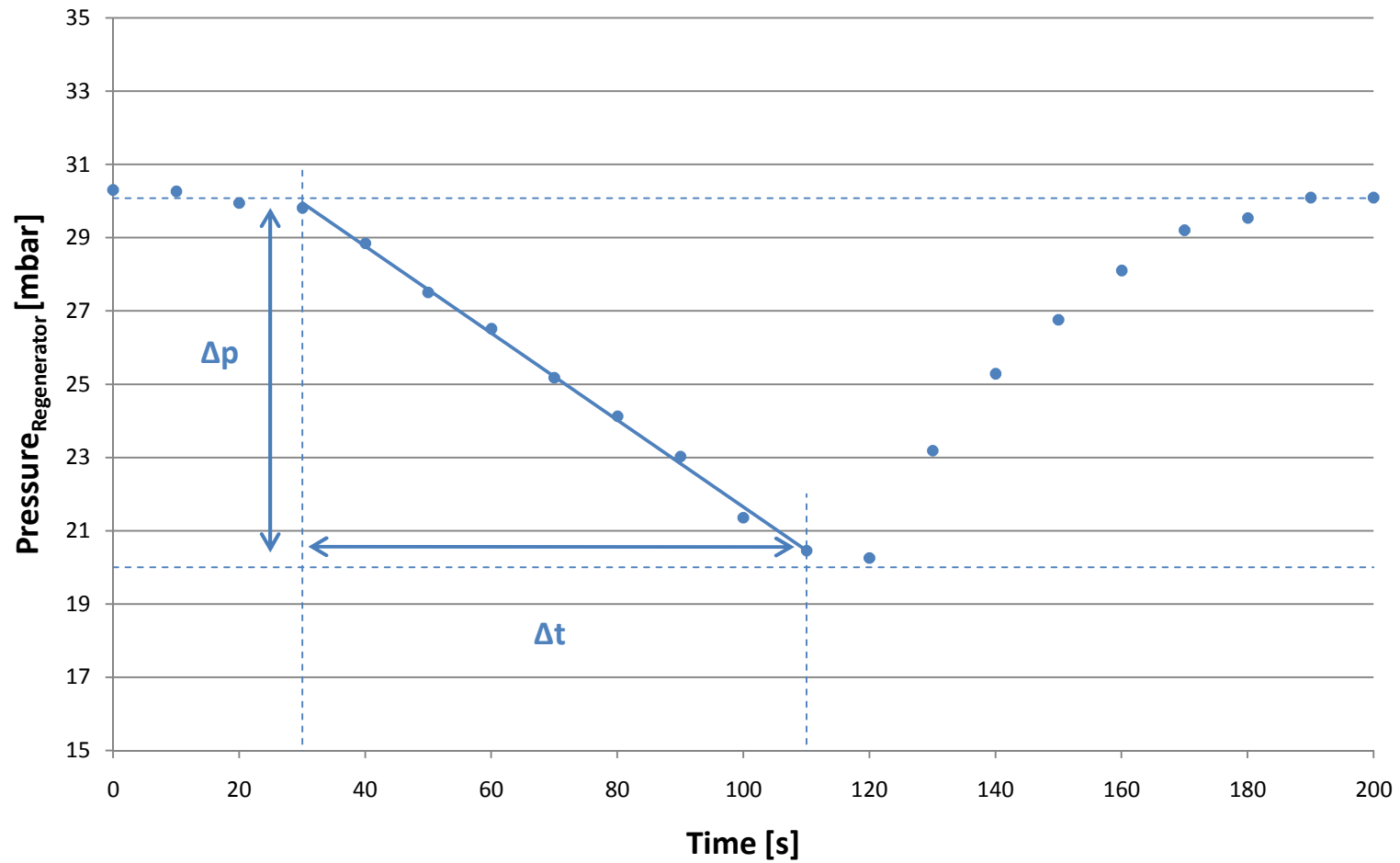
- Commonly used as BioDiesel
- Made from renewable resources, non-fossil
- Carboxylic group causes hygroscopicity

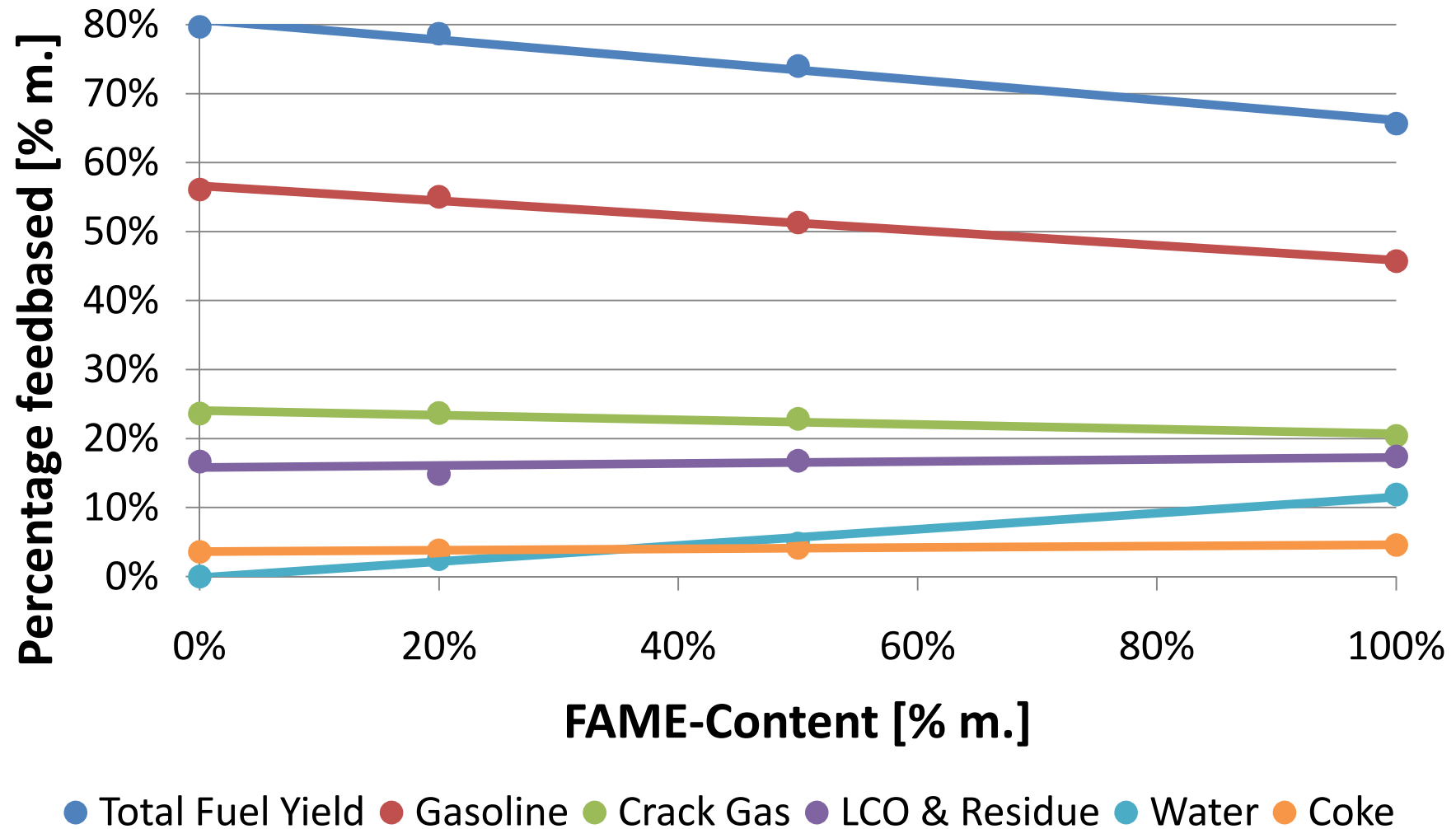
- Objective:
produce gasoline & olefins from renewable resources
- Refining of vegetable oils
 - Degumming (remove lecithins and phospholipids)
 - Neutralization (remove free fatty acids)
- Transesterification of vegetable oils
 - Glycerin accrues (valuable, produce H₂)
 - Excess FAME can be sold as BioDiesel

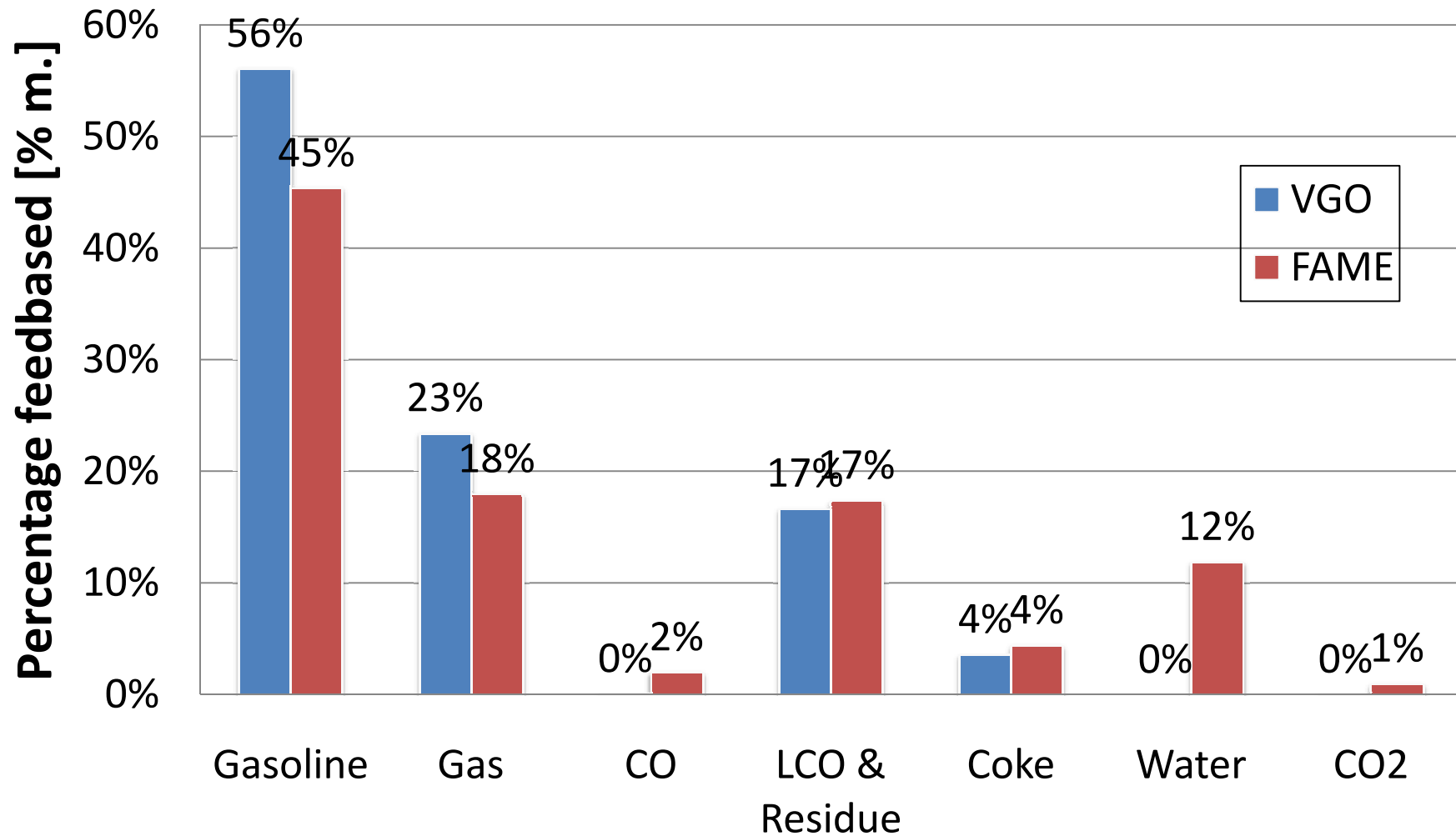


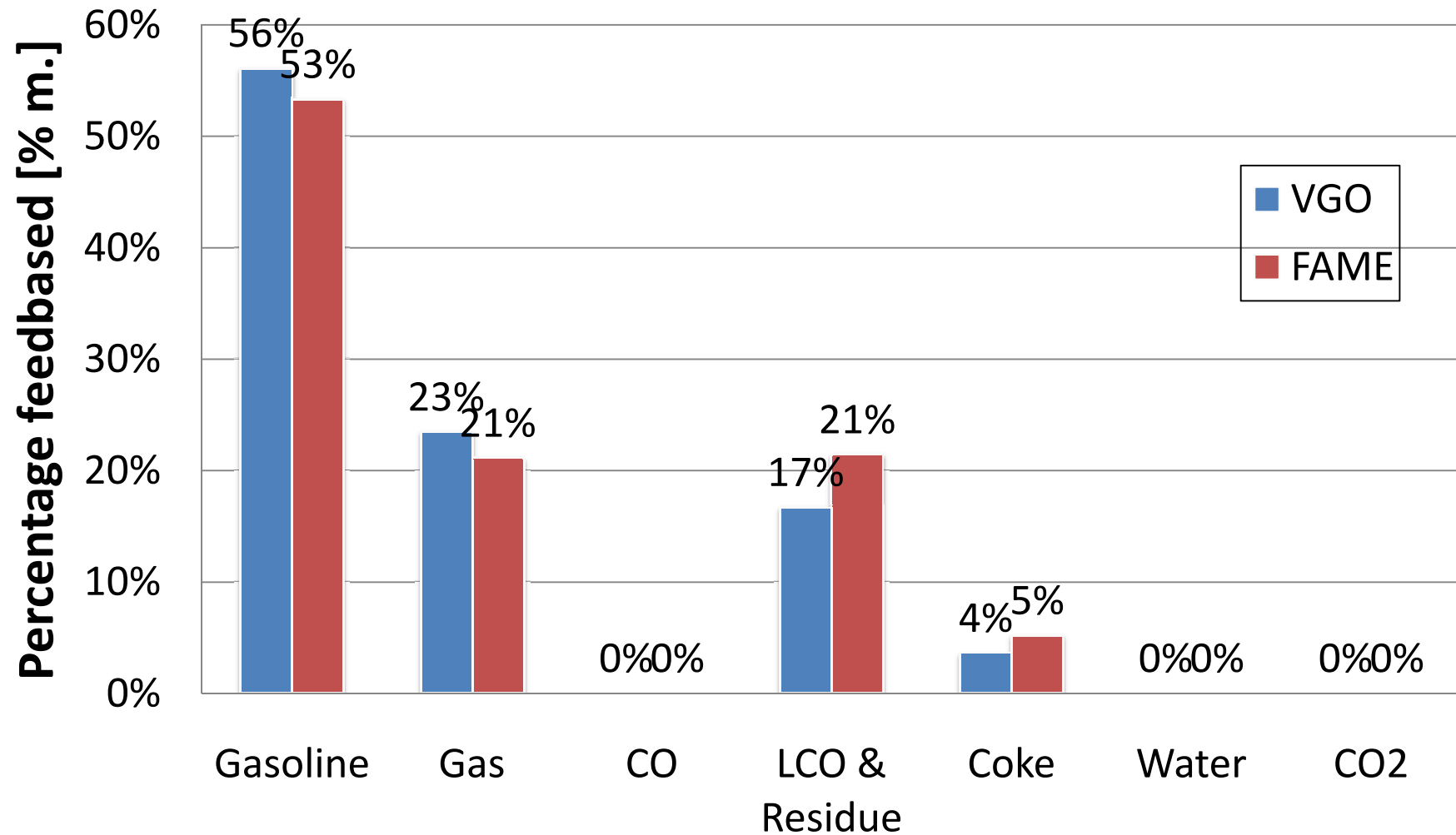
Schematic of the FCC-pilot plant

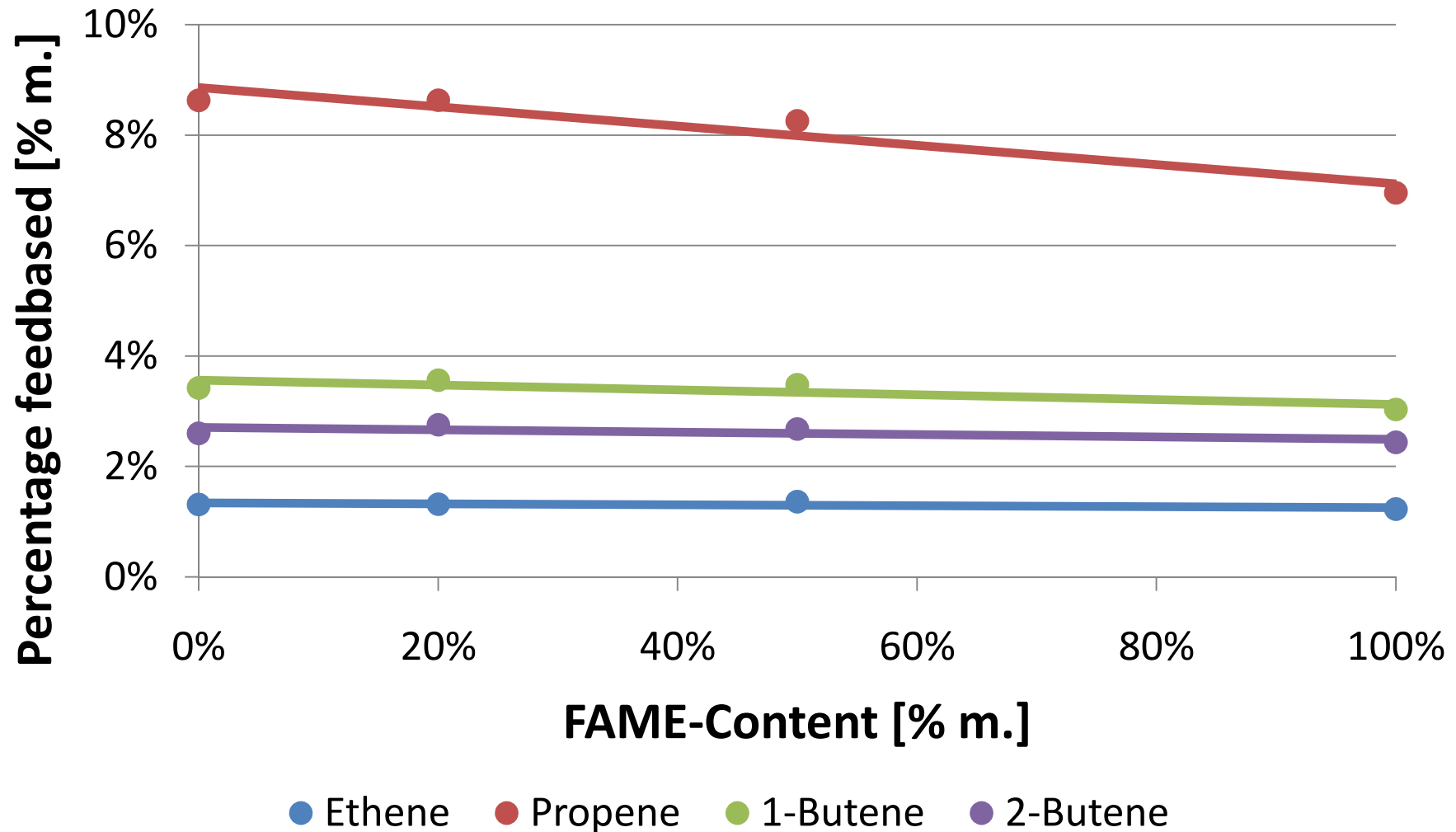
- Compact design
- Simplified architecture
- Heat coupling regenerator – riser
- Possible to measure catalyst circulation rate directly

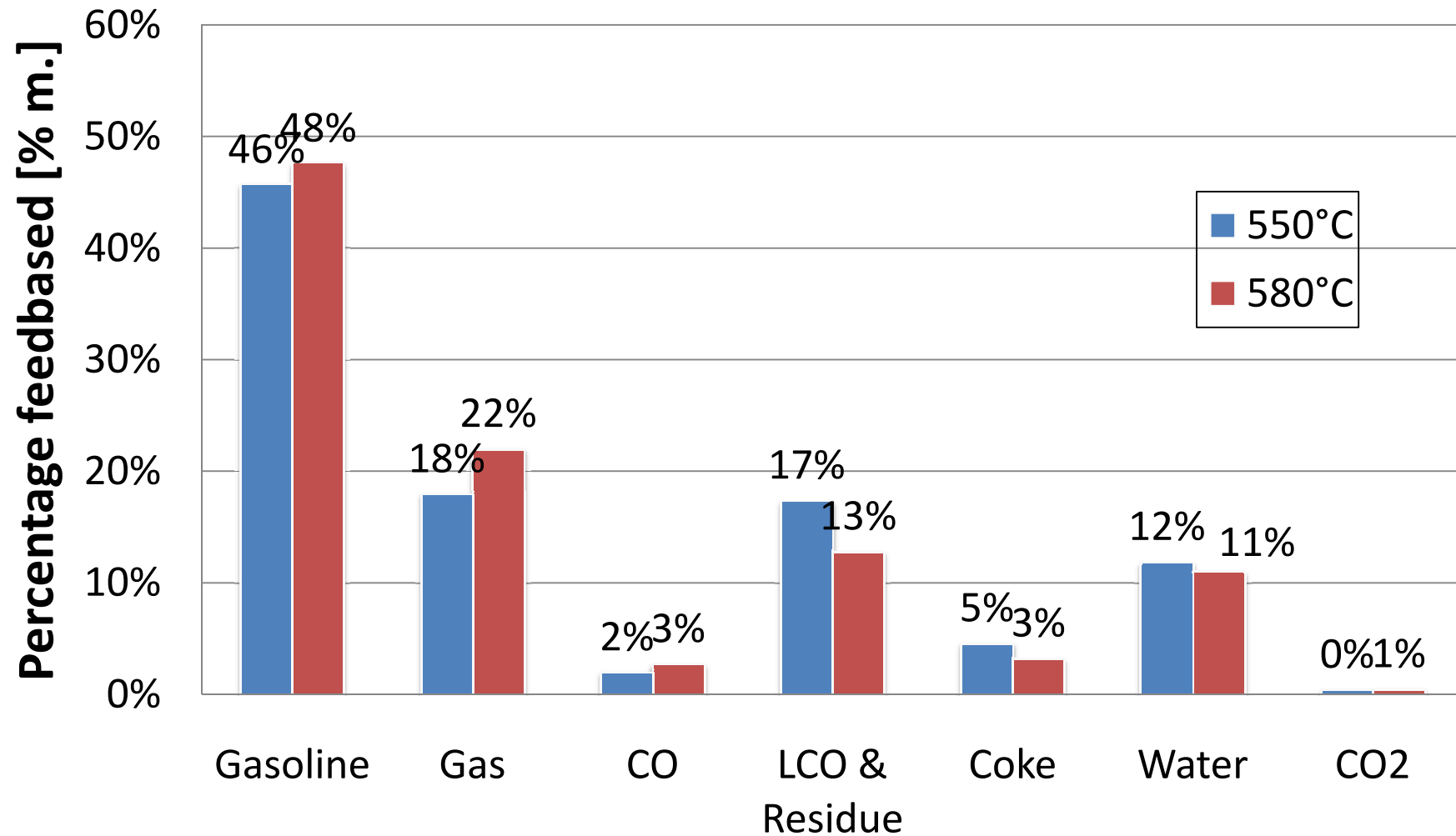












- Pure FAME were processed successfully
- Unlike BioDiesel, the produced gasoline is oxygen-free
- The gasoline & olefins are chemically equivalent to conventionally produced products (from VGO)

This work was supported by OMV Corporation.





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Thank you for your Attention!

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- Gasoline
 - High octane numbers
 - Oxygen-free
 - Contains no lead & almost no sulphur

- Crack-Gas
 - High amounts of propylene (34% wt)
 - Possible source to produce bio-plastics

Property	Jatropha Gasoline	Conventional FCC-Gasoline
RON [-]	95	91 – 96
MON [-]	81	78 – 84
Density [kg/m ³]	801.0	
Pb-Content [mg/L]	< 0.1	
S-Content [mg/kg]	2.0	100 – 2000
O-Content [%m.]	< 0.3	