

Host site bioliq at Karlsruhe Institute of Technology

N. Dahmen, H. Leibold, M. Willy, M. Eberhard, J. Abeln
- presented by Andreas Niebel -

Institute for Catalysis Research and Technology

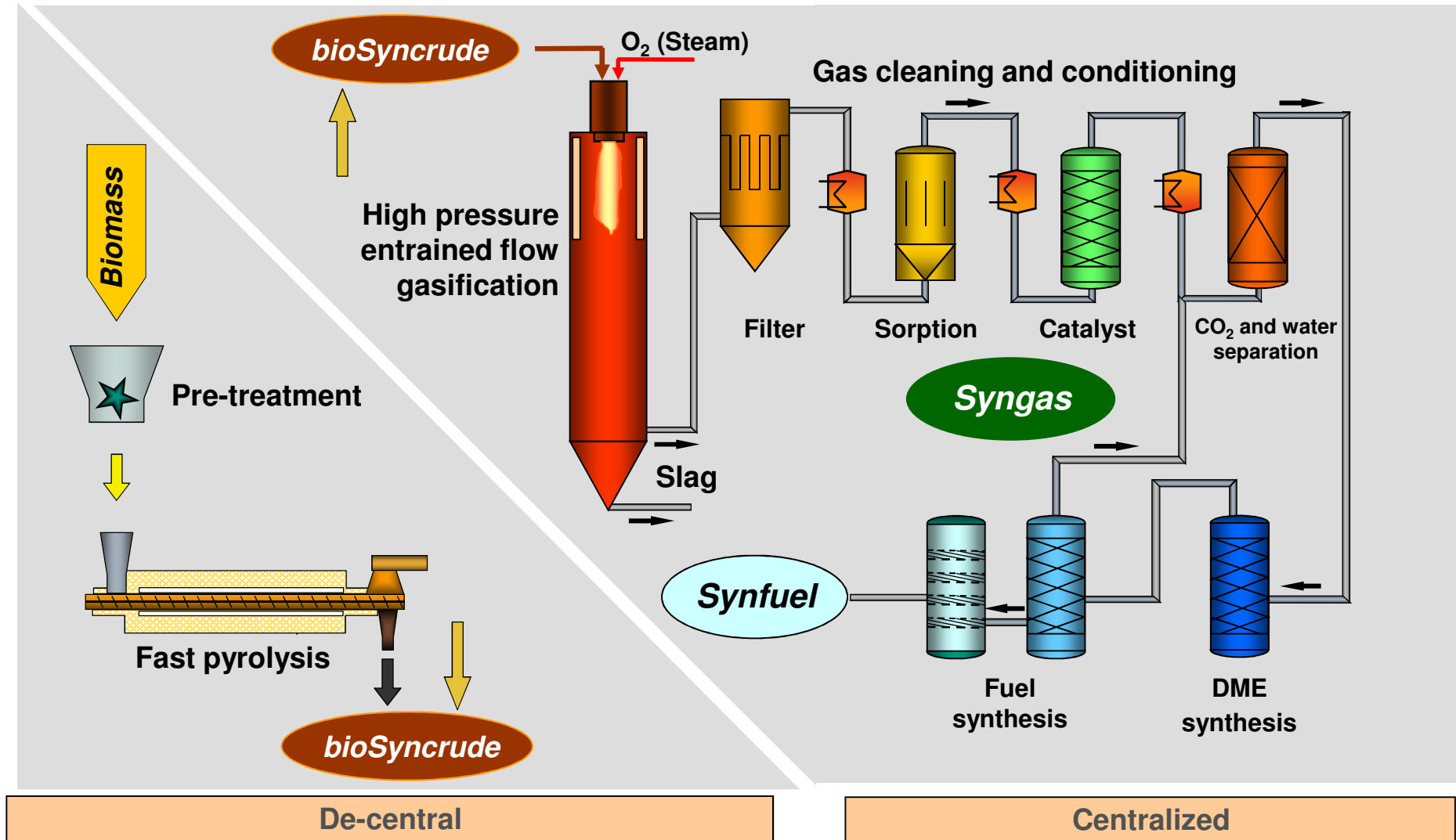


**Person to contact:
Coordinator bioliq at KIT:**

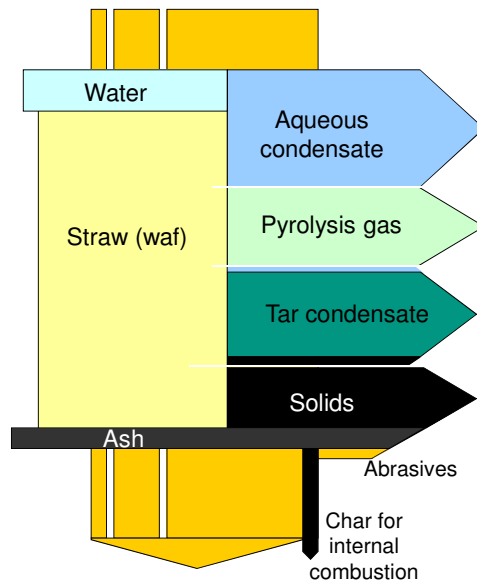
PD Dr. Nicolaus Dahmen

Karlsruhe Institute of Technology (KIT)
Institute of Catalysis Research and Technology (IKFT)
Hermann-von-Helmholtz-Platz 1
D-76344 Eggenstein-Leopoldshafen
Mail: nicolaus.dahmen@kit.edu
Phone: +49 721 608-22596

Concept overview



bioliq I – fast pyrolysis



- Process:
fast pyrolysis of biomass at 500 °C
- Sampling
 - Solid products
 - Liquid products
 - Gaseous products
- Parameters / analytical methods:
 - Particle analysis (heat carrier and solids)
 - Viscosity
 - Water content
 - Heating value
 - Gas chromatography

bioliq II – gasification



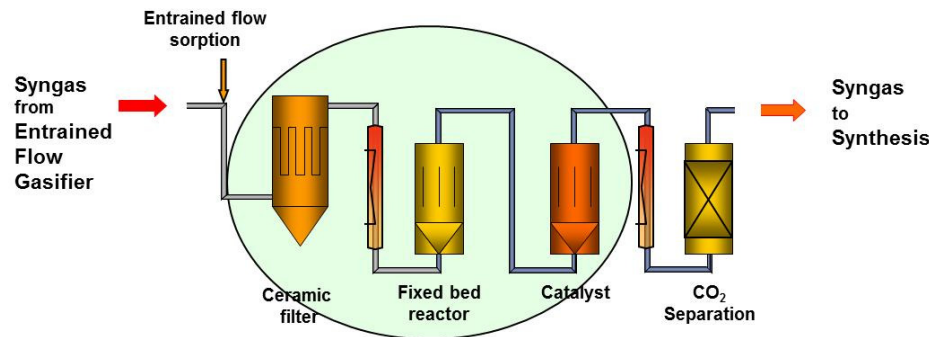
- Process:
high pressure entrained flow
gasification, $> 1200\text{ °C}$, $< 80\text{ bar}$
- Sampling/Analytical methods:
 - Process gas composition:
GC for H_2 , CO , CO_2 , CH_4 , H_2S , N_2
 H_2O via vapour pressure curve at
saturation point
- 8 sampling points for water analyses
- 3 sampling points for slurry
- 2 sampling points for syngas

bioliq IIIa – syngas cleaning



- Process:
HTHP (800 °C, 80 bar) combined filtration / sorption / catalysis
- Sampling
 - Extraction/decompression/cooling
 - Intermittent sampling (particulates)
 - periodic / continuous (gas)
- Parameters / analytical methods
 - Particulates (mass, size distrib.)
Extractive, light scattering
 - Trace contaminants

HCl, NH ₃ ,	Laserspectroscopy
HCN, H ₂ O	
H ₂ S	GC-FPD, IMS, UV-VIS
HCs	GC, FTIR



bioliq IIIb/IV – DME and gasoline synthesis



■ Sampling

- Gas & liquids: GC
- Gas phase should be in-line (high P & T), e.g. FTIR
- Catalyst characterization
- Fuel analysis (special methods)

- Process:
 - Two step synthesis using clean syngas at pressures up to 50 bar

- 1st step: direct DME synthesis:
 - Catalyst mixture (commercial)
 - $T \leq 270 \text{ }^\circ\text{C}$, $\tau \leq 20 \text{ s}$
 - Highly selective to DME

- 2nd step: fuel synthesis:
 - ZSM-5 type catalyst
 - $T \leq 400 \text{ }^\circ\text{C}$, $\tau \leq 30 \text{ s}$
 - Complex product spectrum (rectification)