



Wir schaffen Wissen – heute für morgen

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Once-through alcohol quench system for on-line and off-line tar analysis

Sampling system applied for the characterization of gas streams from biomass gasification plants containing non condensable and condensable compounds in the presence of particles.

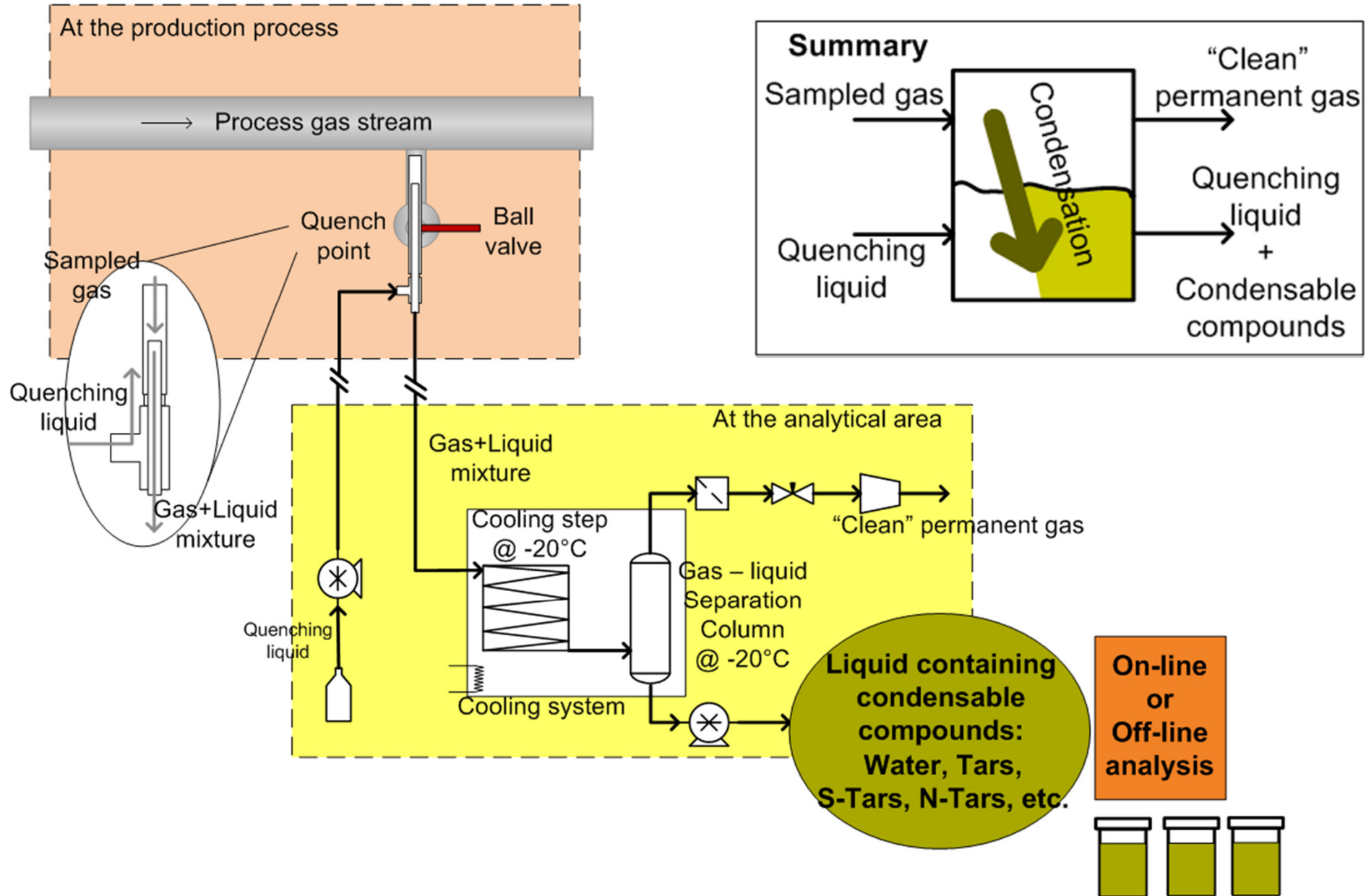
Sampling of:

- Permanent gas (H_2 , CO, CH_4 , etc.)
- Water
- Tars
- S-tars, N-tars, O-tars, etc.
- Scales: bench, pilot and industrial
- Research and industrial application (e.g. material screening, plant operation control)

Why another method?

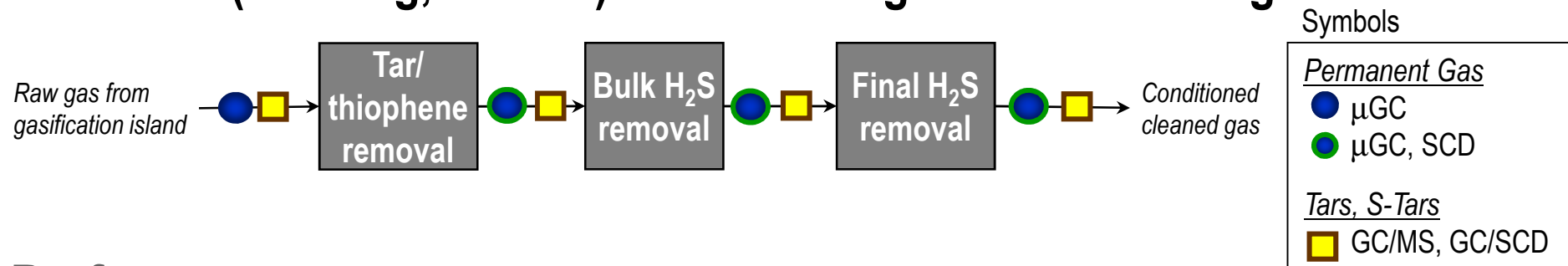
- Simultaneous sampling of permanent gas and condensable compounds
 - Time resolved measurements of condensable compounds
 - Long duration sampling with less man-hours required
 - Wide concentrations range: important when measuring contaminants in low concentrations (e.g. mg/m^3_N)
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Principle of operation: Liquid quench sampling system



- Operational Experience: more than 10'000 h of sampling on different gasifiers, gas cleaning systems. Most prominent application: SNG PDU

SNG PDU (Güssing, Austria): Gas cleaning and conditioning



Performance

- Robust & simple:** Training period of one week for usual application
- High sensitivity:** liquid samples generated can be more concentrated than gas originally sampled, which is desired for trace analysis
- High selectivity:** compounds with boiling point higher than + 50°C
- High time resolution:** determined by on-line analytics or frequency of liquid sampling (e.g. every 5 or 10 min.)

Important goals have been reached:

- Robust and flexible concept to measure non condensable and condensable compounds from gas streams of gasification plants and research units
- High time resolution and high sensitivity

Current improvements and future work

- System automation:
 - Measurement and control of flows, pressure and temperature
 - Automatic liquid sampling
 - Online liquid analysis (e.g. UV-Vis, density = H₂O concentration in solvent)
 - Compounds with boiling point from -50°C to +50°C: stripping of liquid stream
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Thank you for your attention !

Questions ?

For more information visit the Visual Presentation section :

VP2.4.11

Characterizing Gas Streams in Biomass Gasification Plants Using a Liquid-Quench Based Diagnostic Tool: Influence of the Sampling System

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