



SINTEF is non-profit contract R & D organization based in Norway.

The organization has around 2000 employees.

SINTEF has strong R & D expertise across the CCS value chain.

SINTEFs Tiller CO2 capture pilot plant has been in operation for 12 years.

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Workshop on Measurement, Monitoring and Controlling Potential Environmental Impacts from the Installation of Point Source Capture

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# SINTEFs expertise relating to emissions from solvent-based CO<sub>2</sub> capture

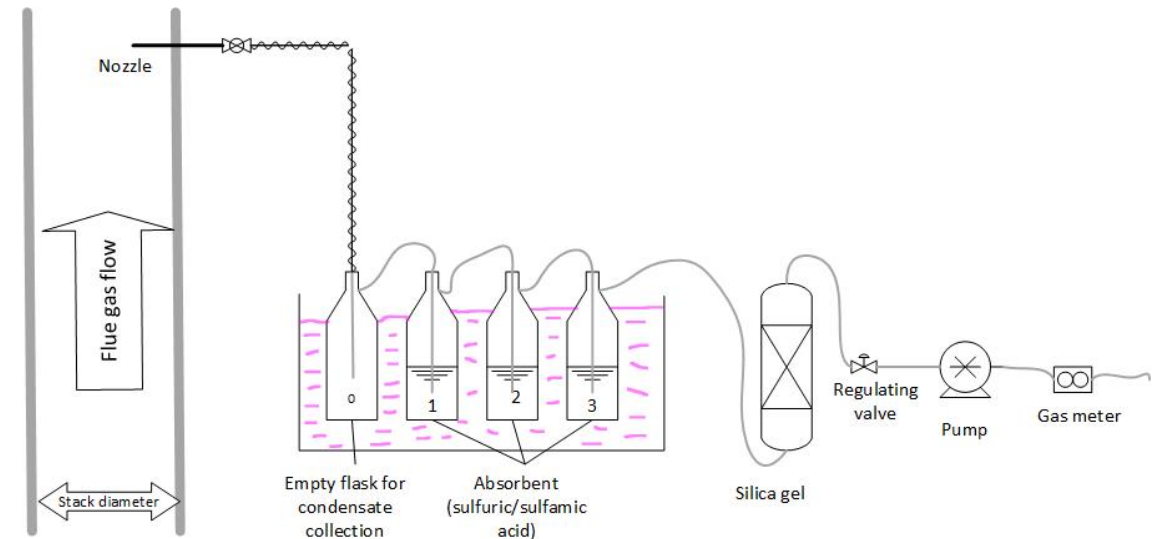
- Extensive experience on capture plant emission monitoring
  - Including Tiller pilot, support to ACC, TCM and other sites
- Advanced capabilities in analysis of amine degradation
- Studies on emission control and aerosol related emissions
- Played an important role in the Norwegian Government's Technology Qualification Program for the Full-Scale Mongstad Project (later cancelled)
  - This included studies on emissions, solvent degradation and atmospheric chemistry. This work was done in collaboration with other partners.

A large number of studies from Norwegian funded projects on emissions are available online:

<https://gassnova.no/en/uncategorized-en/studies-focusing-on-amine-components>

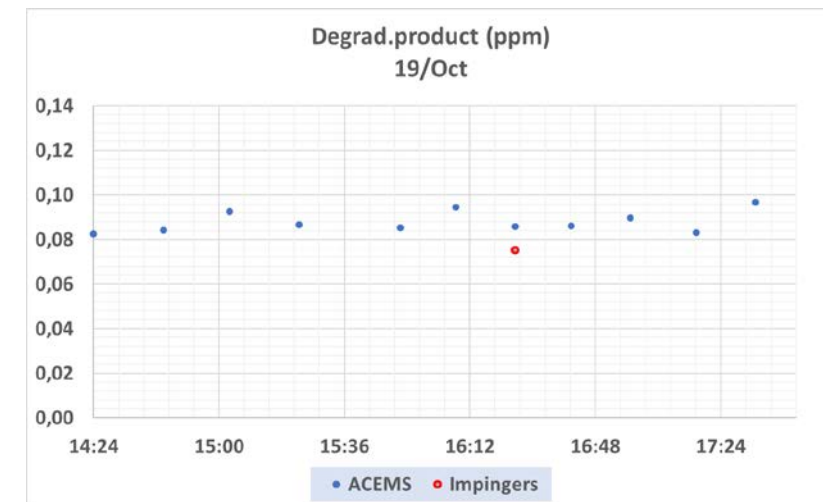
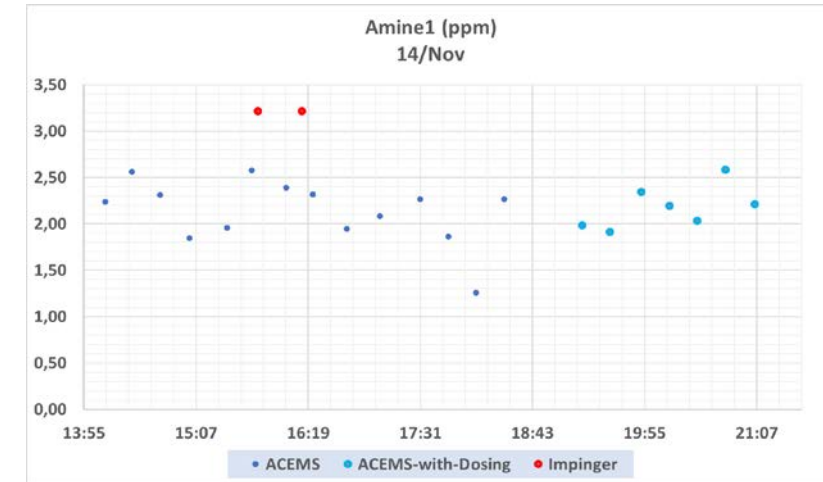
# How to measure emissions?

- FTIR is standard instrument, but quantification limits are not that low
  - Cannot be used for trace components and not clear if it will be sufficient for solvent components
- Impinger trains offer very accurate measurements for all emission components
  - This is however an offline approach and is labor-intensive
- SINTEF relies on LC-MS for most analysis
  - This includes aldehydes and nitrosamines. Our total nitrosamine method is GC-NCD.
  - For MEA SINTEF has essentially closed the nitrogen mass balance.
  - Working to do the same for other solvents
- Absorber Continuous Emission Monitoring System (ACEMS) is a instrument being developed by SINTEF (next slide)
- PTR-MS-TOF is an advanced online option. Not used by SINTEF.
  - Probably not suited for industrial application and we focus on ACEMS development
- How best to monitor emissions in an industrial setting is still not obvious



# ACEMS

- Absorber Continuous Emission Monitoring System (ACEMS) is an instrument being developed by SINTEF. Represents an automation of an impinger train measurement
  - online measurements of amines, degradation products and nitrosamines.







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## Relevant ongoing projects



SCOPE aims to close critical knowledge gaps along the entire flow path for the exhaust gas that is being purified. This includes studies of emission management and environmental risk assessment.

<https://www.scope-act.org/>

SCOPE is an ACT funded project.



AURORA

The AURORA project seeks to test and qualify a solvent-based carbon capture technology, called [CESAR1](#), for industrial deployment. This will include extensive piloting.

<https://aurora-heu.eu/>

AURORA is an EU funded project.



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*Thank you for your attention!*