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Analytical methods for LT-CFB Gasifiers

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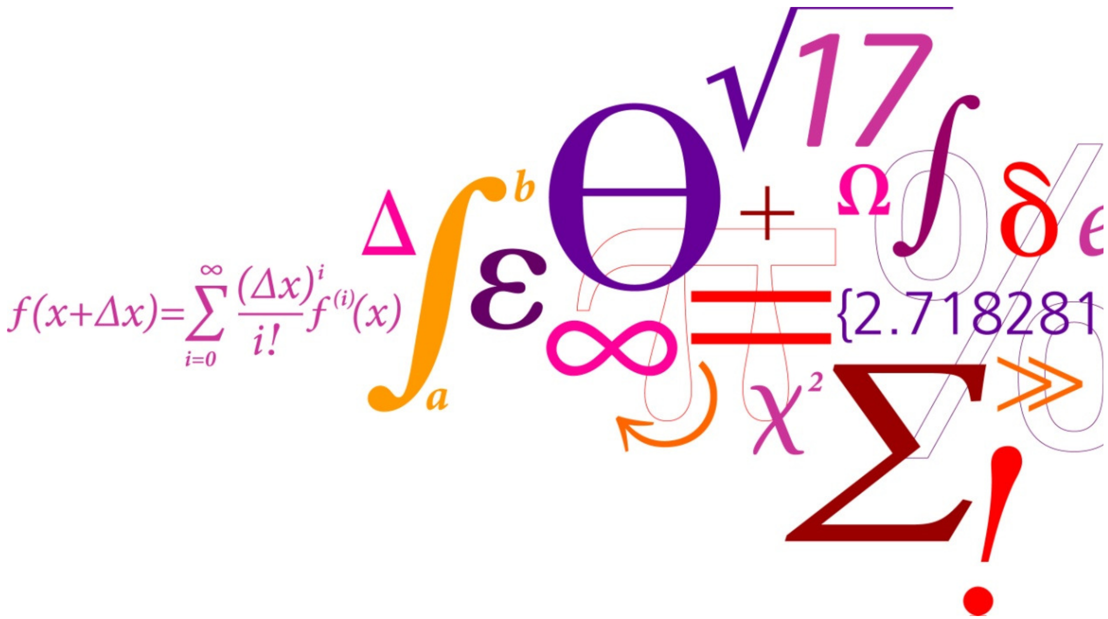


Analytical methods

- On-line process control
- On-line IR and UV spectroscopy
  (cross stack measurements and gas extraction)
- Combined methods, e.g. MS/MS

Offline measurements?

Sampling:

Petersen column, SPA, bags and gas-pipettes

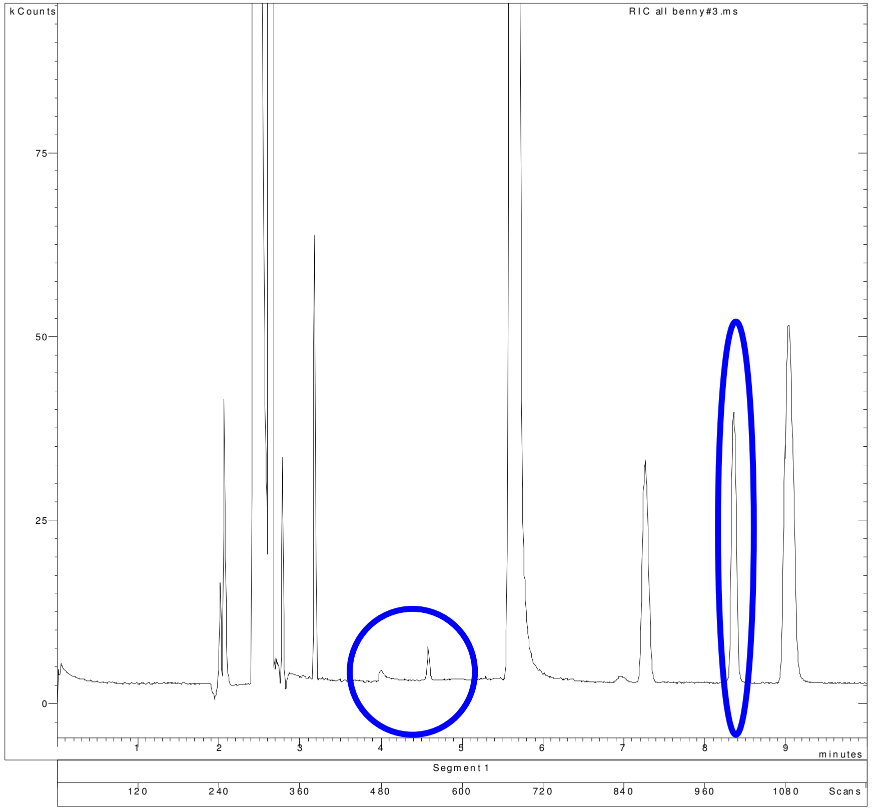
Analysis:

- **GCMS: complex samples/trace analysis**
- **(stable isotope dilution)**

- **LC-MS/UV: high-molecular-weight compounds, e.g. large PAH**

- **GC-FID/HWD: low-molecular-weight compounds**

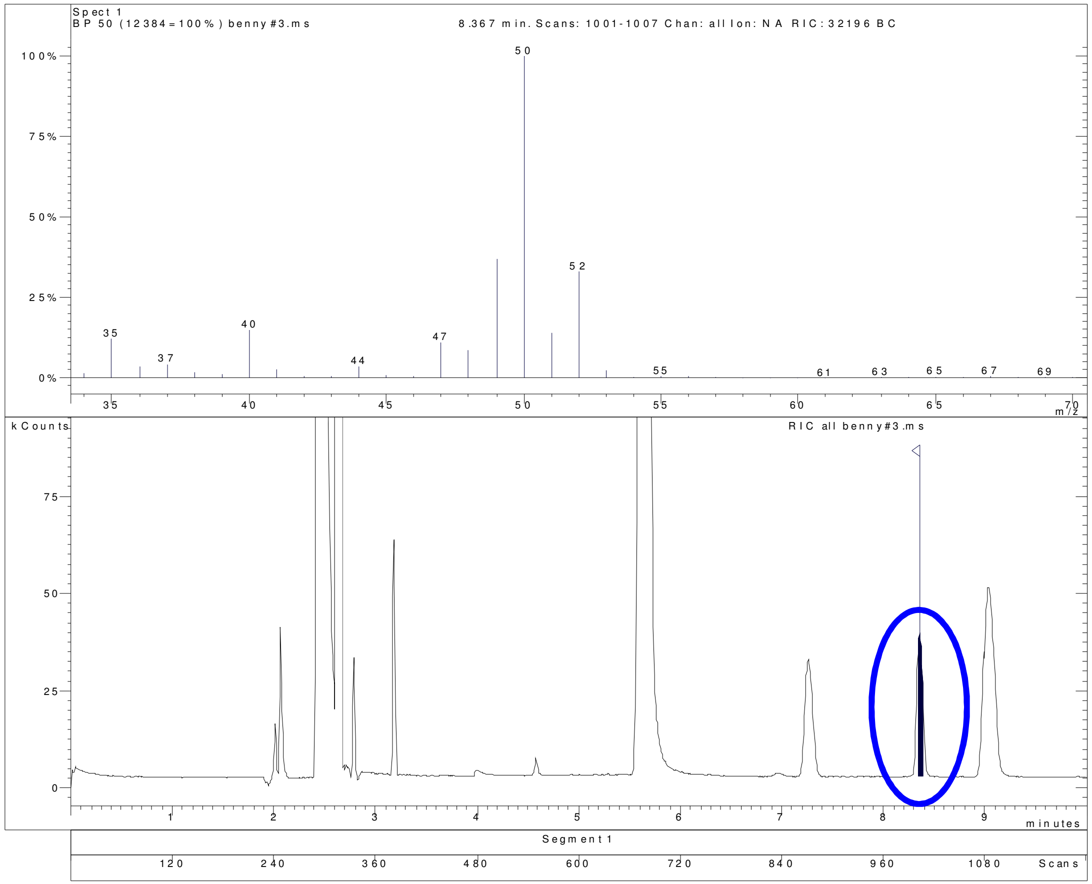
Producer gas from LT-CFB- the C2-C3 window



A valuable separation was obtained using a fused silica column packed with CP-PoraPLOT U either isothermal at 80 ºC or using a temperature program 50-200 ºC.

The chromatogram contains a numberof peaks, apparently not hydrocarbonsor oxo-compounds.

Critical components – methyl chloride

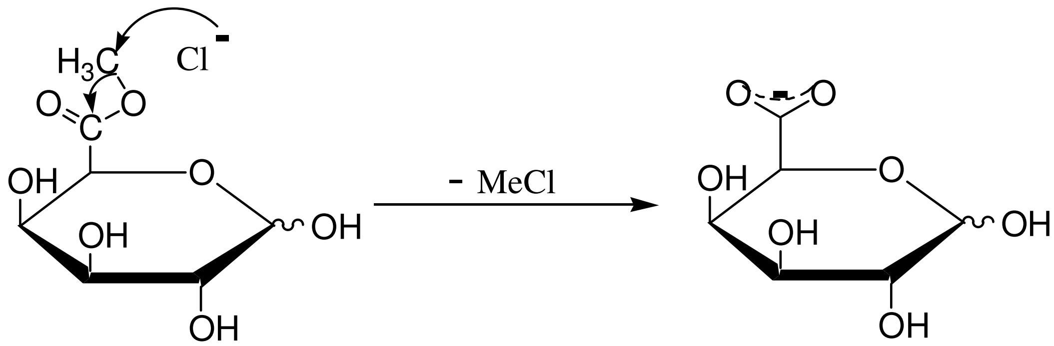


Methyl chloride is a common constitutent in producer gas from updraft and LT-CFB gasifiers (level 10-200 ppm).

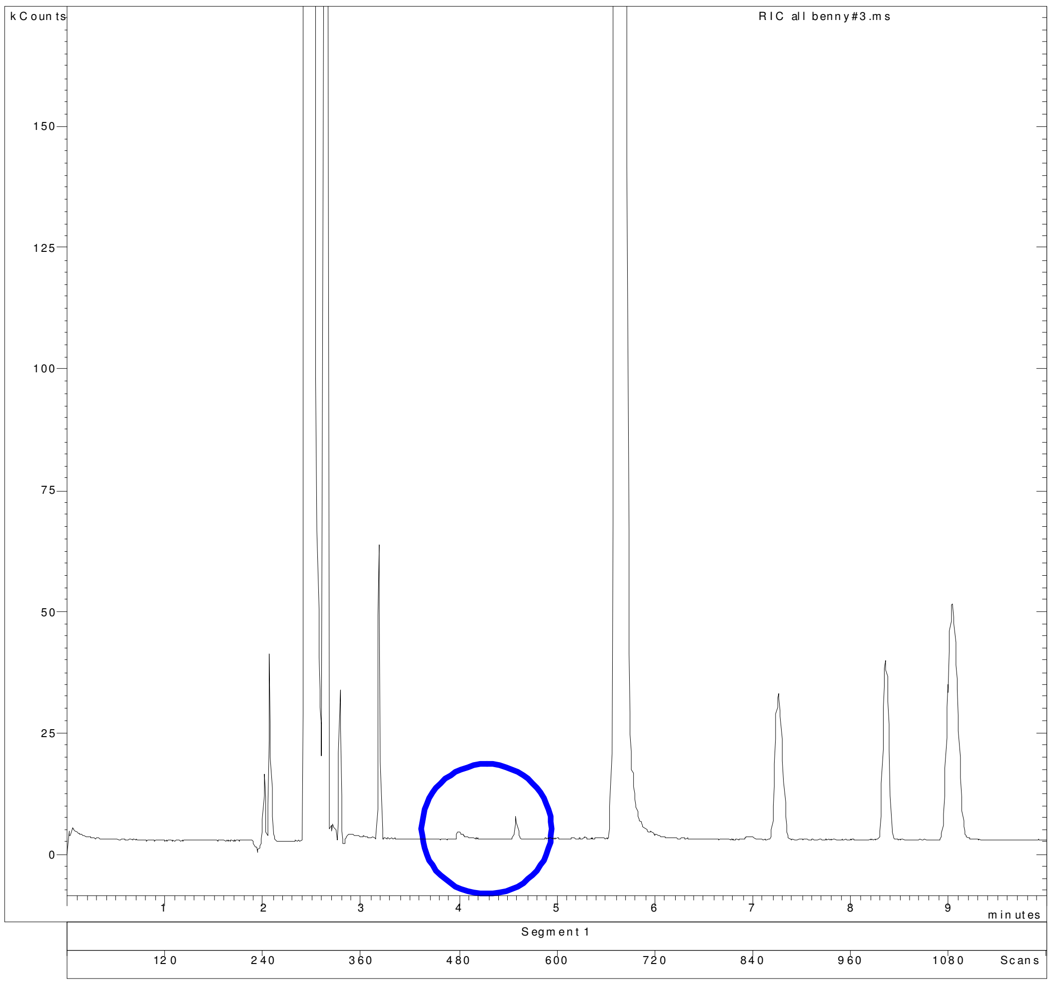
The origin of methyl chloride

Abiotic conversion of chloride to methyl chloride occurs readily in plant material with the ubiquitous plant component pectin acting as a methyl donor.

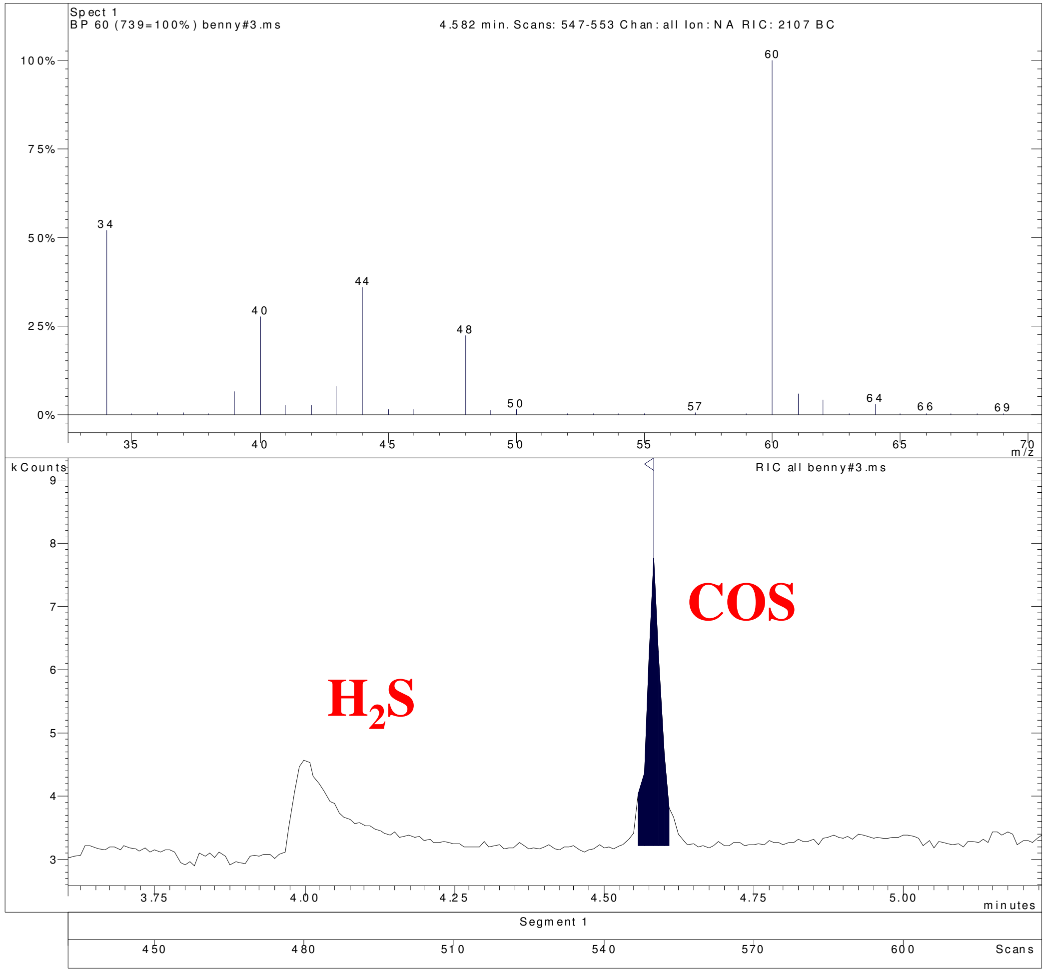
Apparently, the reaction is nucleophilic in nature as the release of MeX compounds are observed by heating pectin with other halide and pseudohalide ions.



Critical components



Critical components -COS



Concluding remarks

In this brief acount it has been demonstrated that critical components may reveal very different chemical structures.

Apparently standard analytical methods enable the identification and quantitation of a number of these species.

Element- specific detection is needed