Pure gases analysis

Chromatotec®

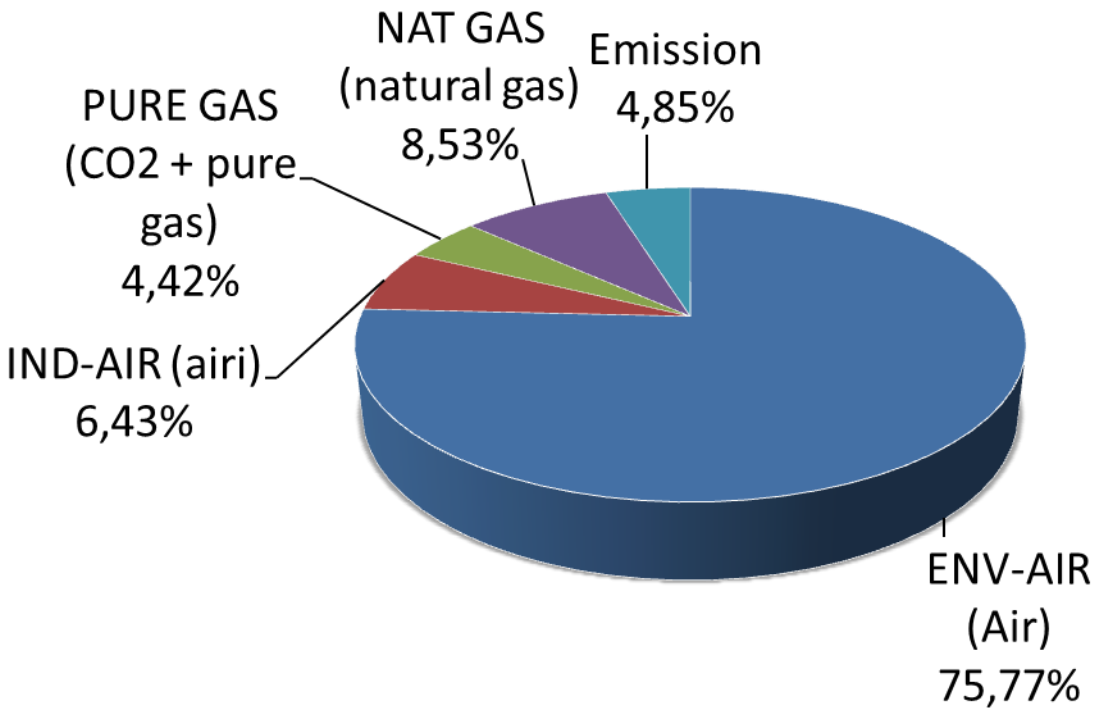
Outline

- Pure gases market
- Chromatotec® sales
- Products – Pure gases
- Price list
- Conclusion

Pure gases market

- Different kind of applications:
  - Food industry (CO2 quality control)
  - Medical (e.g. oxygen)
  - Clean room (electronic devices production)
  - Nuclear power plant (different applications)
  - Pure gases manufacturers (Air Liquide, Messer,…)

Chromatotec® sales

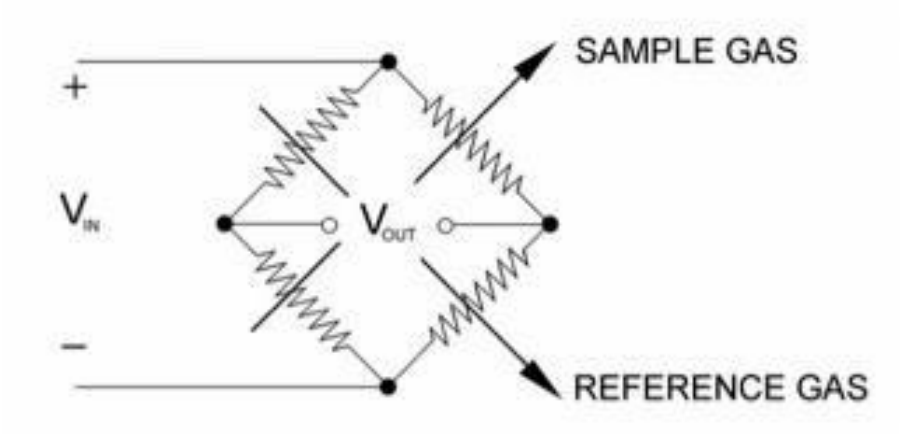


Products – Pure gases

- Impurities in Pure gases
  - chromArgon
    - Detector: Thermal Conductivity Detector (TCD)
    - Carrier gas: Argon
    - Sampling loop
    - Sensibility: low ppm
    - Possible gases to be analysed:
      - Ne / H2 / He / N2 / O2 / CO2 / CO / CH4

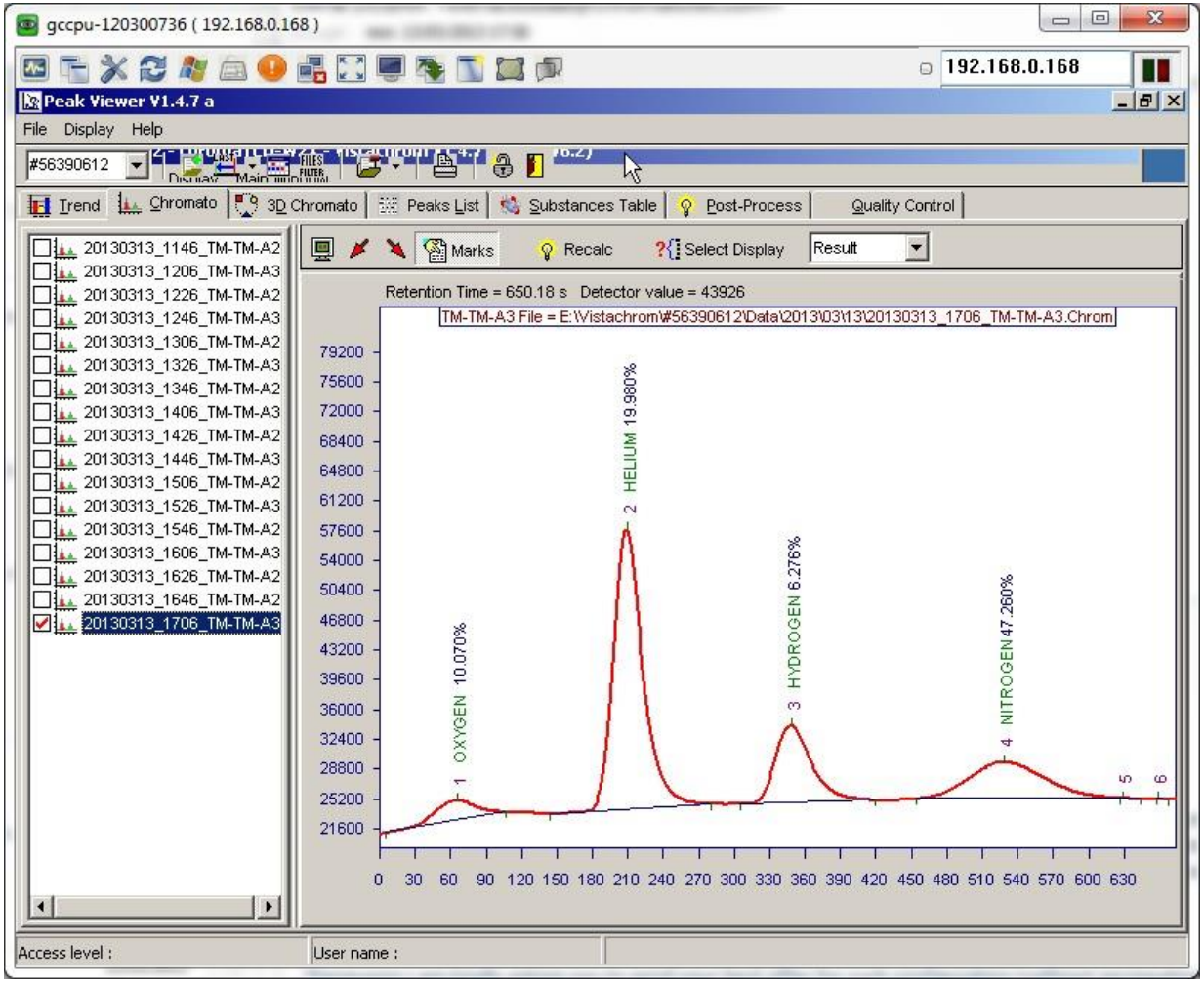
chromArgon
Ref: C41022

Thermal Conductivity Detector



- The Thermal Conductivity Detector (TCD) can detect all kind of compounds.
- The Wheatstone bridge is made of 4 Tungsten-Rhenium wires. It works with **constant current** or **constant voltage**. With the detector, a thermal conductivity difference between the reference cell (carrier gas) and the measure cell (outlet of the column) is measured.
- This value is transferred to an electrometer and the generated signal is proportional to the compounds concentration in the sample.

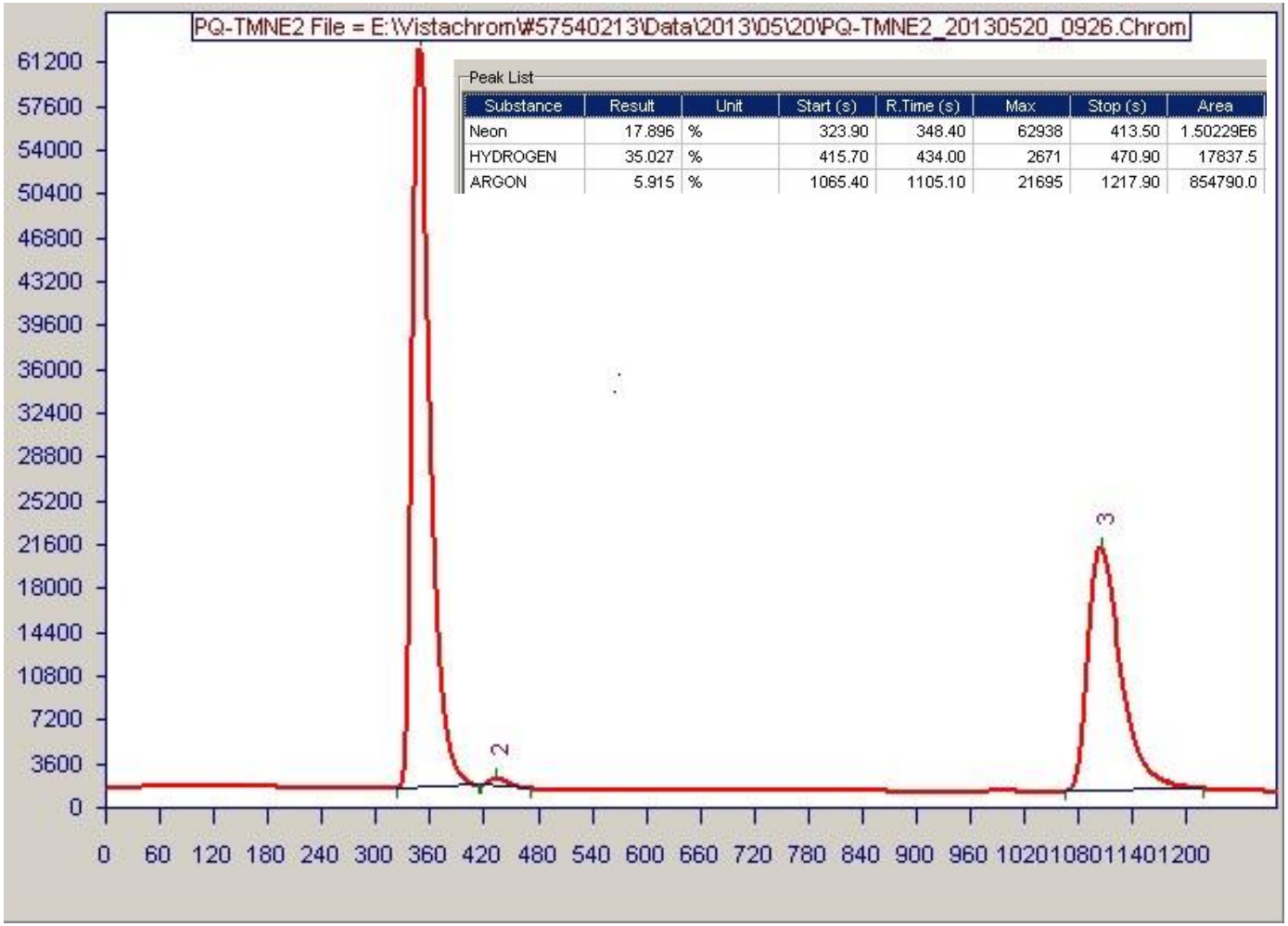
chromArgon application



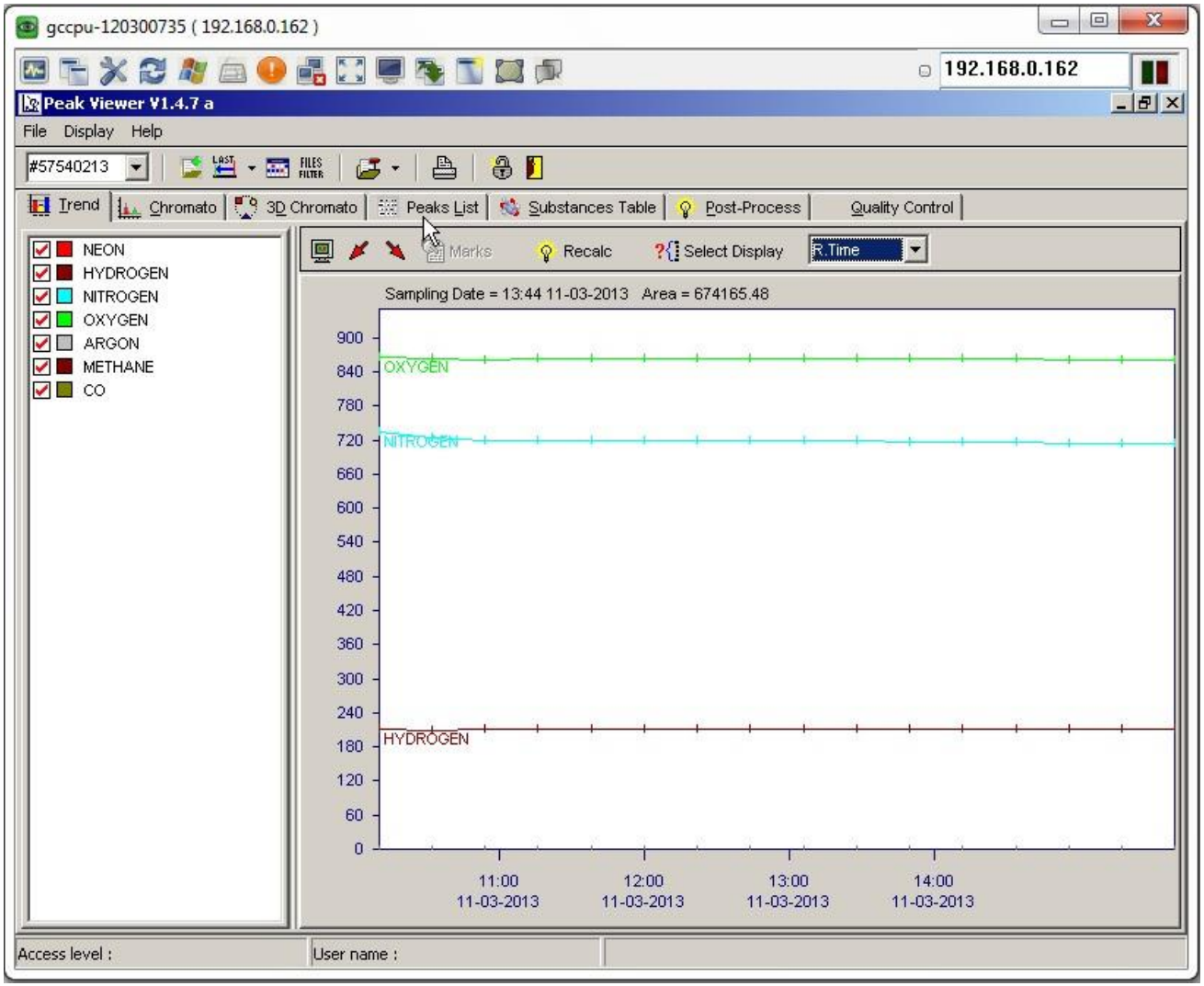
Products – Pure gases

- Impurities in Pure gases
  - chromaTCD
    - Detector: Thermal Conductivity Detector (TCD)
    - Carrier gas: Helium
    - Sampling loop
    - Sensibility: low ppm
    - Possible gases to be analysed:
      - Ne / H2 / N2 / Ar + O2 / CO2 / CO / CH4

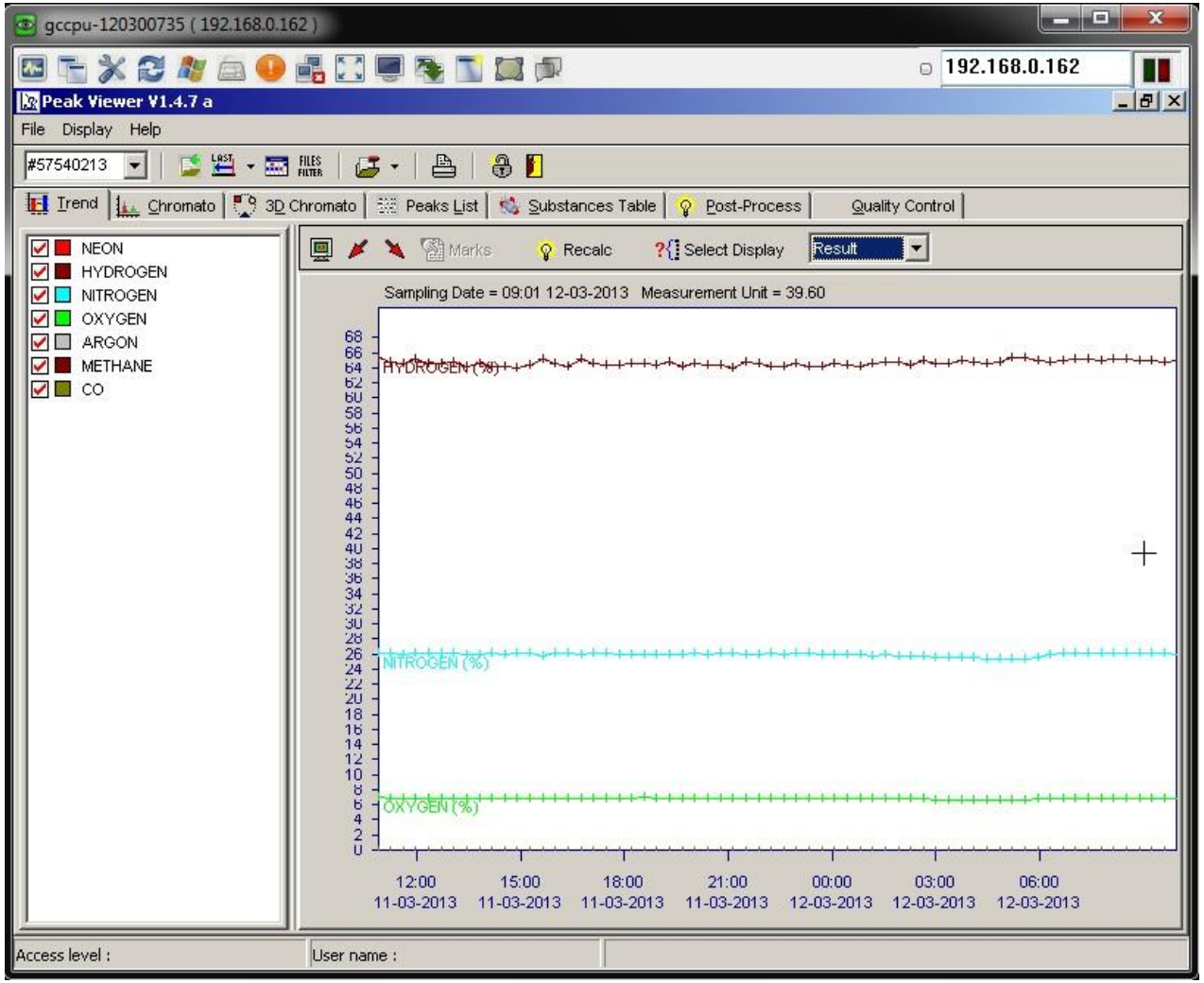
chromaTCD application Ne/H2



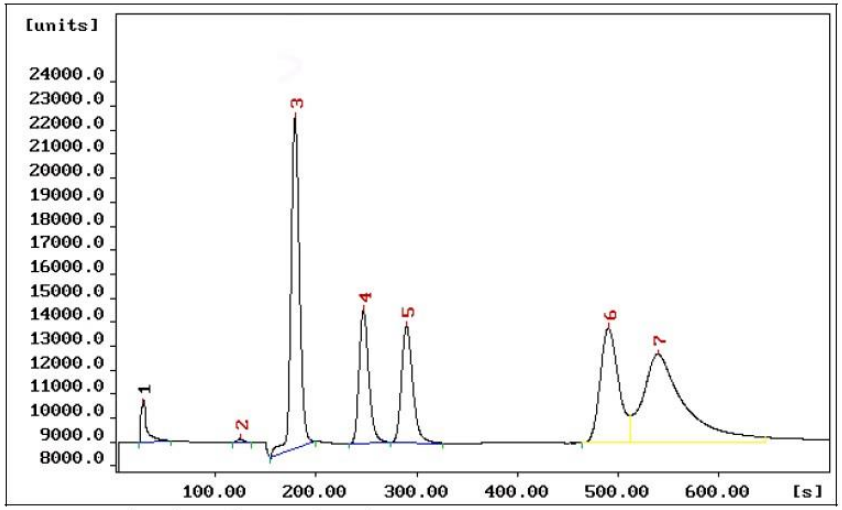
chromaTCD application H2/N2/O2



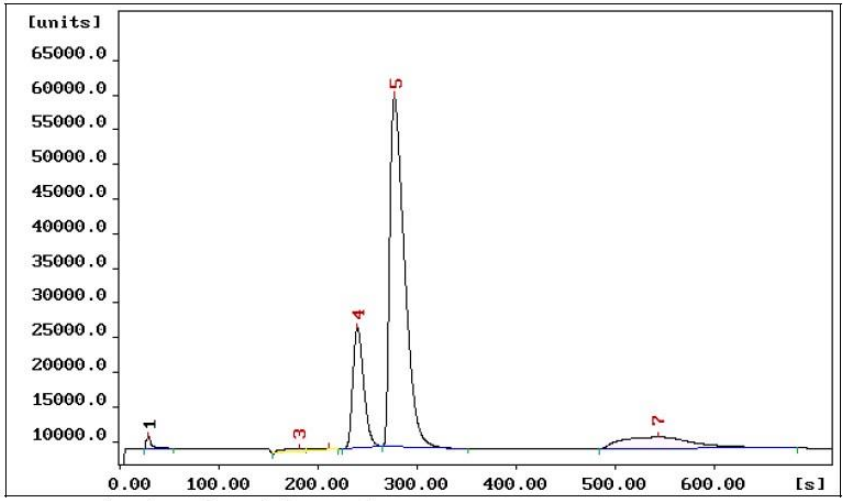
chromaTCD application H2/N2/O2



chromaTCD other application



Analysis of standards



Analysis of ambient air

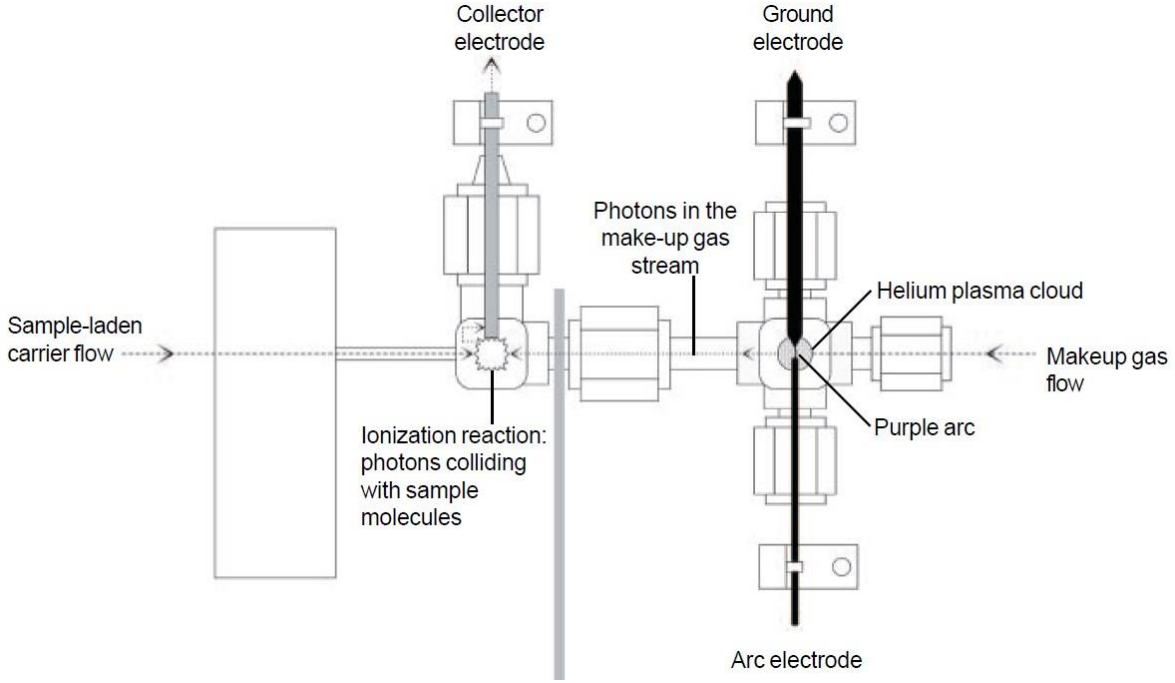
Analysis of standards :

N° of peak	Compound	Retention time (in s)	Area (in counts)	Concentration % (v/v)	Detection limit (in ppm) **High amplification**
2	H2	124,80	1282	5,04	290
3	CO2	179,20	135387	9,93	6
4	Ar	247,00	61304	5,19	6
5	N2	289,80	62740	5,57	6
6	CH4	490,20	100221	10,20	8
7	H2O	539,40	177272		**Loop 1000 µl**

Products – Pure gases

- Impurities in Pure gases
  - chromaDID-He
    - Pulse Discharge (or Helium) Ionisation Detector (DID, HID or PDD)
    - Carrier gas: Helium
    - Sampling loop
    - Sensibility: low ppb
    - Possible gases to be analysed:
      - Ne / H2 / N2 / Ar + O2 / CO2 / CO / CH4

Helium Ionisation Detector



- The HID detector uses two electrodes which support a low current arc through the helium make-up gas flow.
- The helium molecules between the electrodes are elevated from ground state to form a helium plasma cloud. As the helium molecules collapse back to ground state, they give off a photon.
- The sample molecules are ionized when they collide with these photons. All compounds having an ionization potential lower than 17.7eV are ionized upon contact with photons from the helium cloud.
- The ionized component molecules are then attracted to a collector electrode, amplified, and output to the PeakSimple data system.

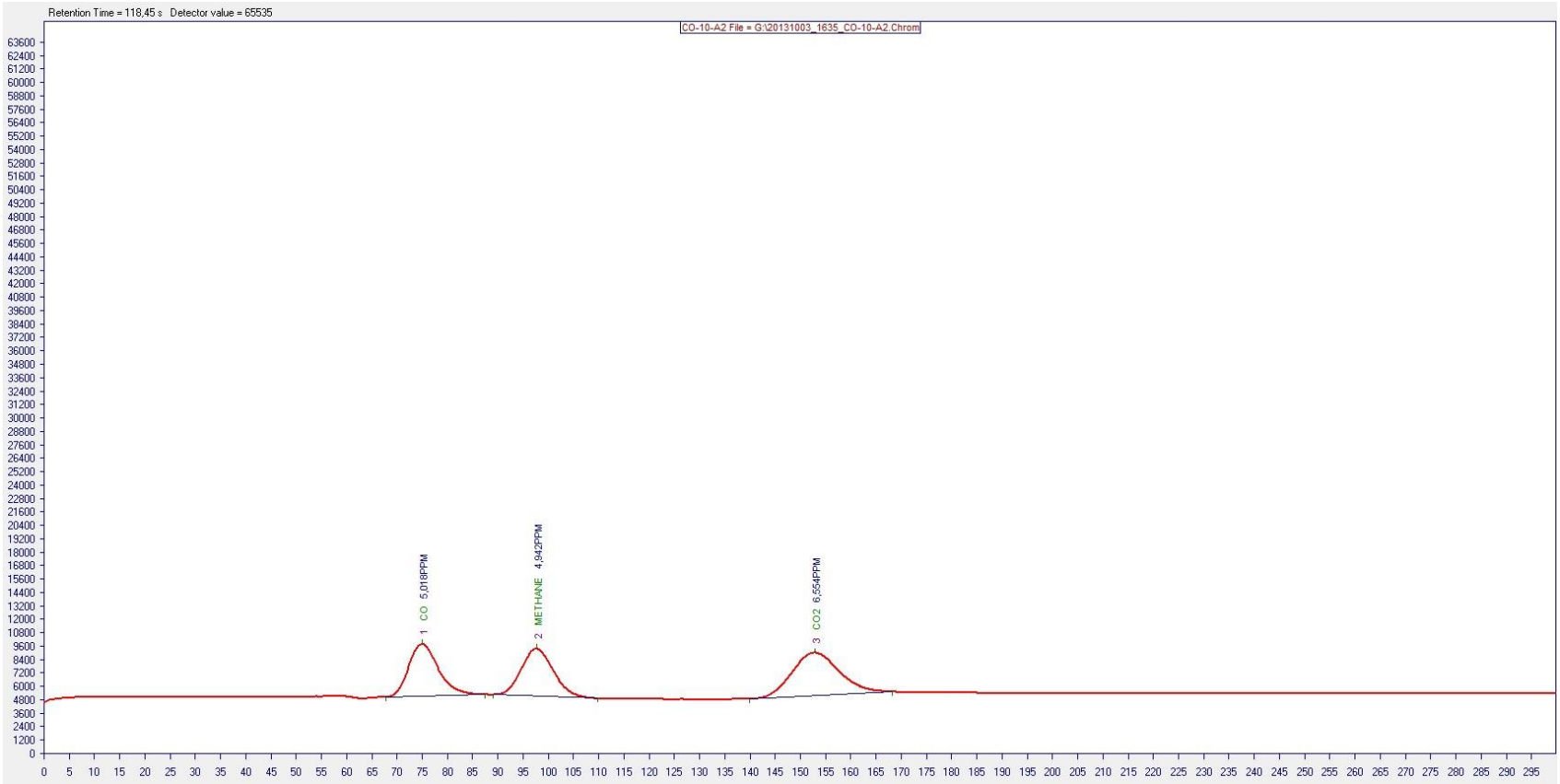
Products – Pure gases

- Impurities in Pure gases
  - chromaDID-Ar
    - Discharge (or Argon) Ionisation Detector (DID-Ar or HID)
    - Carrier gas: Argon
    - Sampling loop
    - Sensibility: low ppb
    - Possible gases to be analysed:
      - BTEX / VOC / NH3 / COS

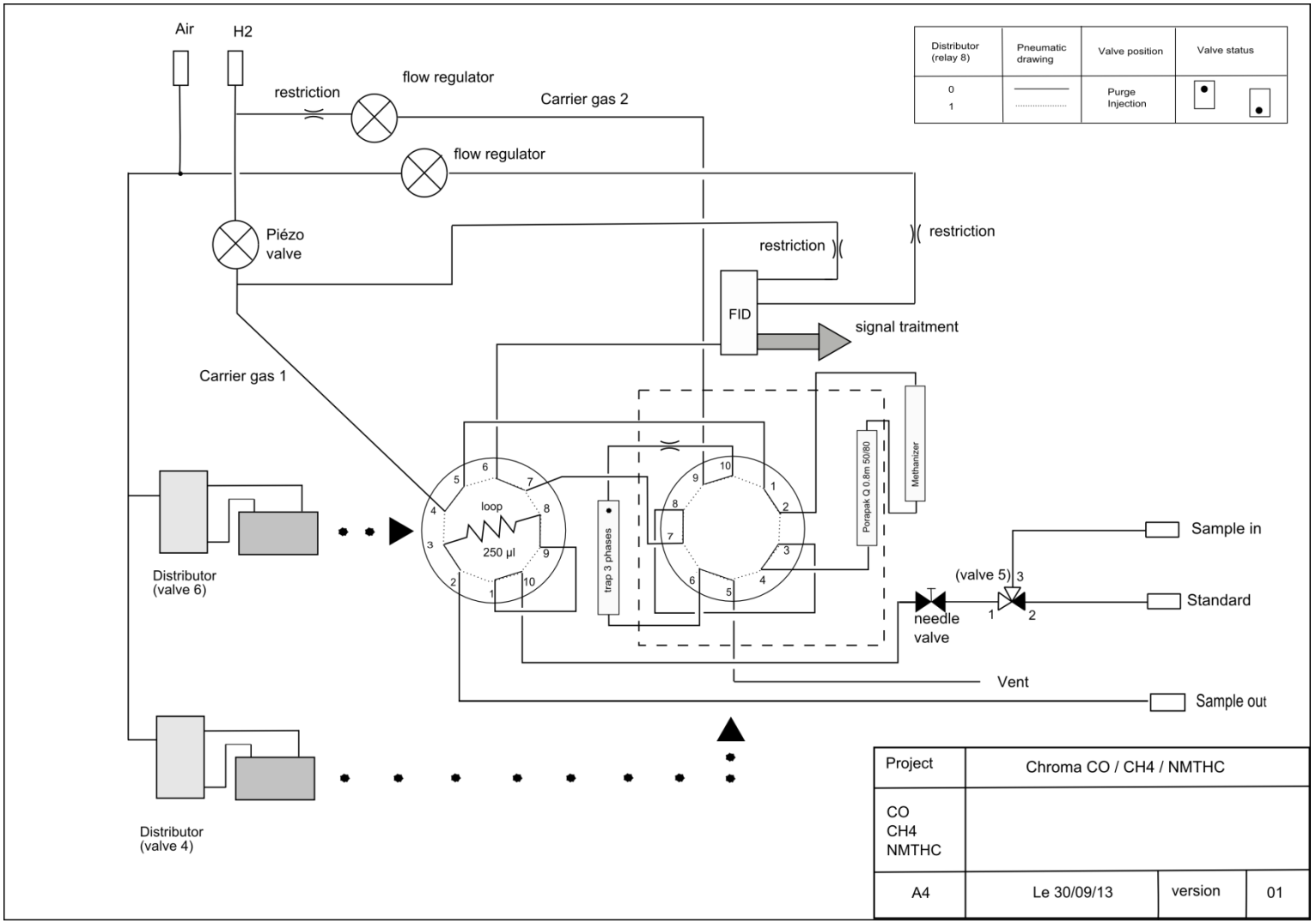
Products – Pure gases

- chromaCO option NMTHC:
  - CO / CH4 / CO2 / NMTHC
  - Methanizer
  - FID detector

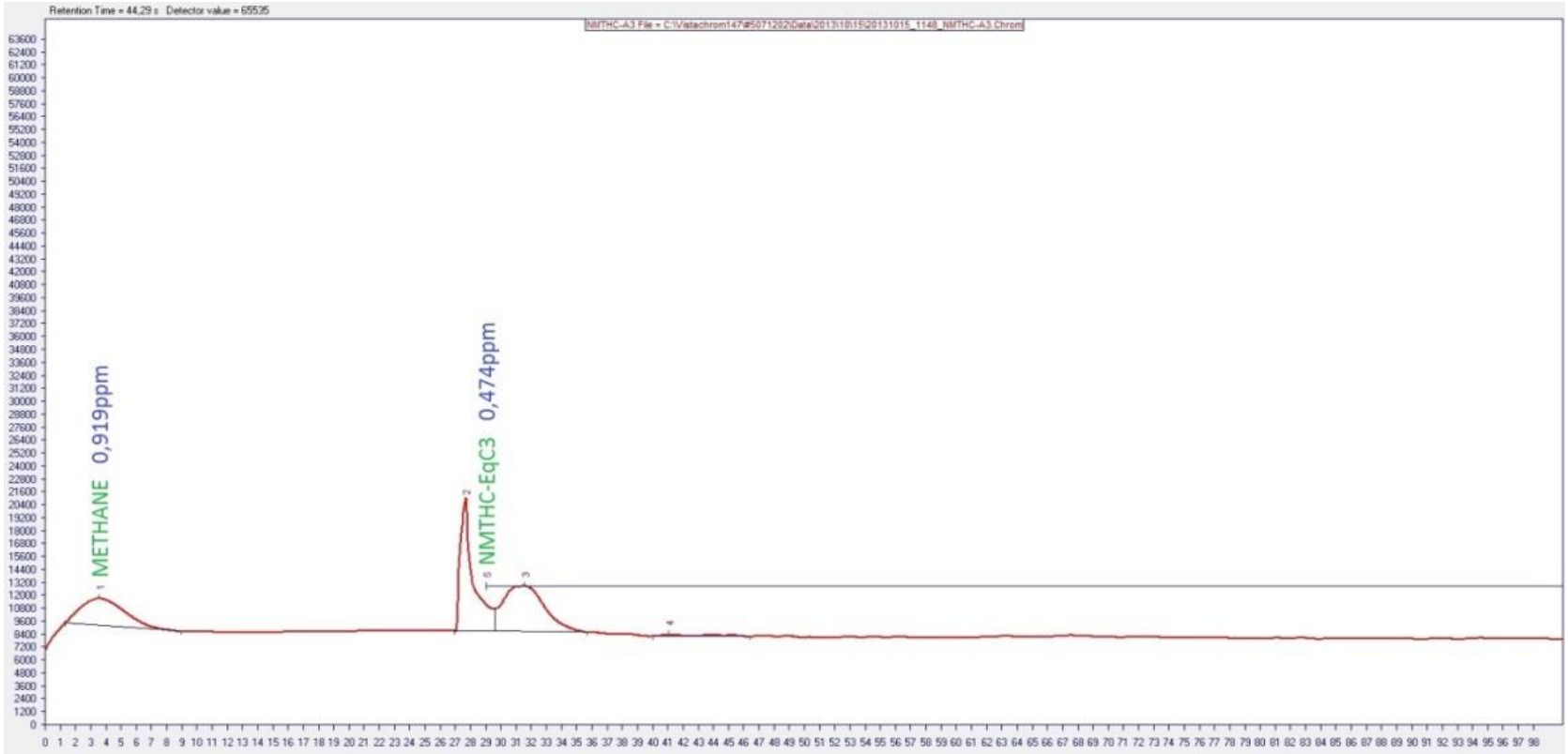
Products – Pure gases



Products – Pure gases



Products – Pure gases



Price list

Analysers

Reference	Rack	Description	Price EUR
C41022	5U	chromArgon or chromaTCD – inbuilt computer	19 900
C81022	5U	chromaDID – inbuilt computer	30 500
C11000	4U	chromaCO option NMTHC (CO / CO2 / CH4 / NMTHC) no sampling pump included	23 460

Options

Reference	Description	Price EUR
XXX914	Carrier gas purifier with cylinder pressure regulator and fittings (He or Ar cylinders at 200 bar)	990
XXX901	airmoPUMP – analyser sampling pump	460
XXX916	Hydroxychrom USB (hydrogen generator)	6 200
XXX031-D	airmoPURE, ppt VOC air generator	4 800

Conclusion

- Possibility to analyse a wide range of pure gases
- Concentration range from low ppb to %
- No interference between Ne/H2 and O2/Ar
- Different carrier gas depending on application

Thank you for your attention !