Innovative Anwendungen mit der Agilent 1290 Infinity LC

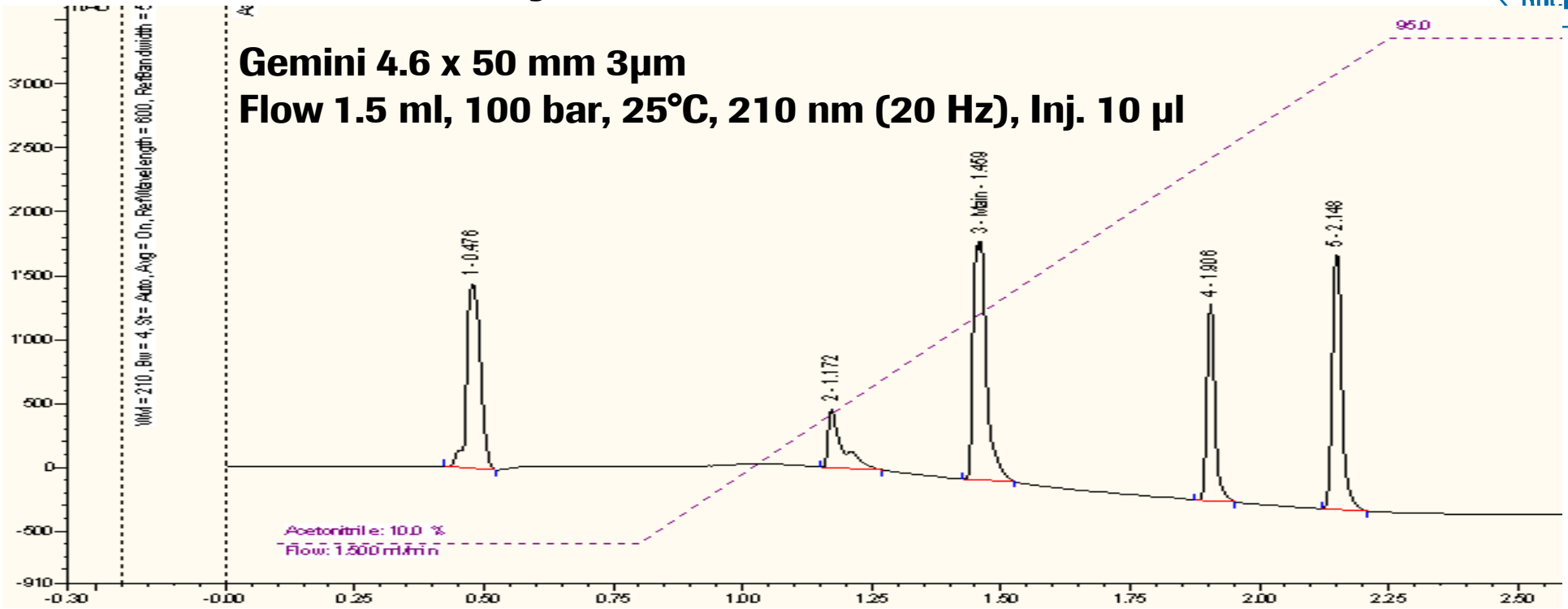
Chemistry Technologies and Innovation
Separation Science Point
Daniel Zimmerli

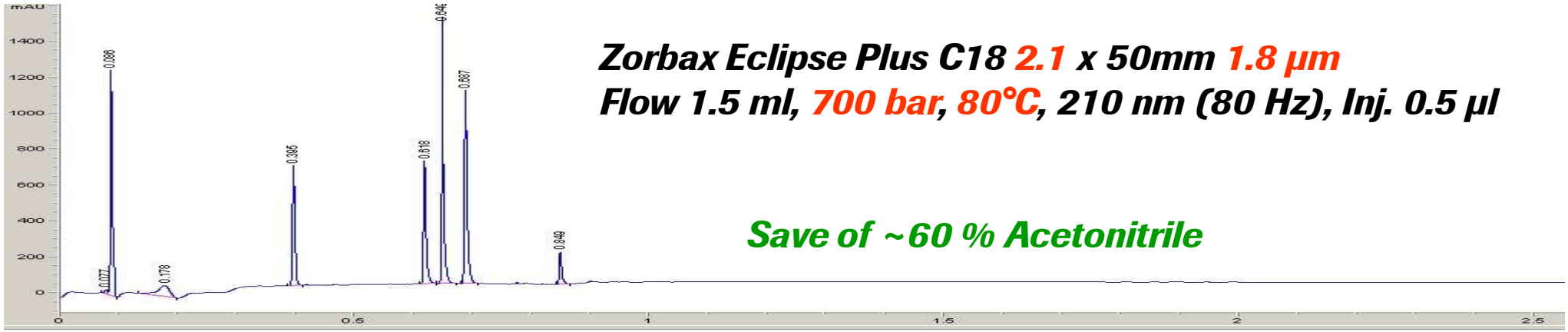
Agilent 1290 Infinity LC Beta Test

Column test

Summary

PRCB standard analytical HPLC Conditions



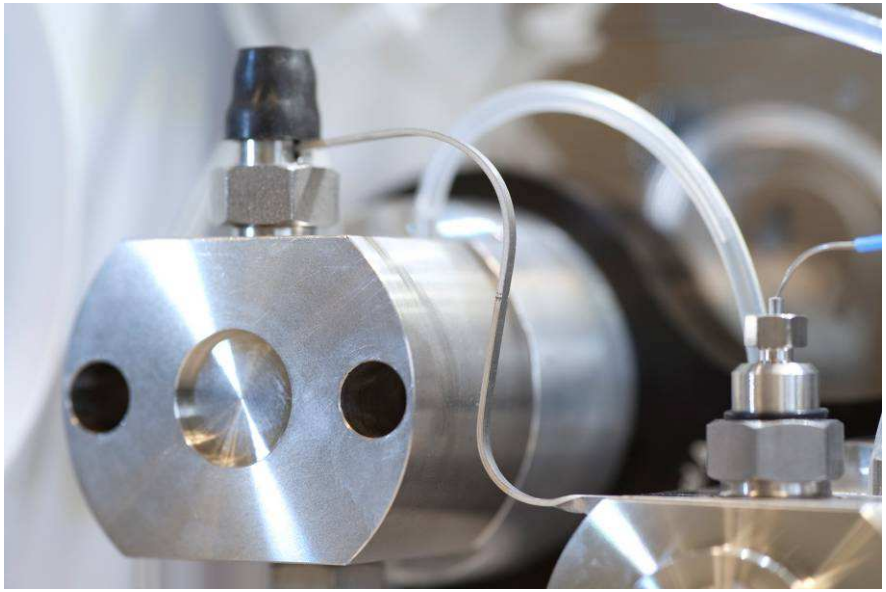


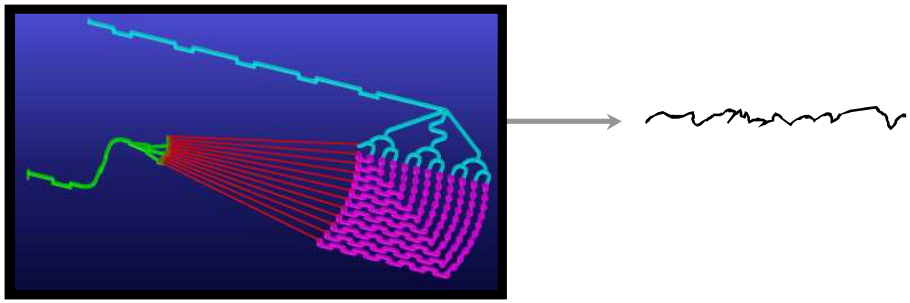
Zorbax Eclipse Plus C18 2.1 x 50mm 1.8 µm
Flow 1.5 ml, 700 bar, 80°C, 210 nm (80 Hz), Inj. 0.5 µl

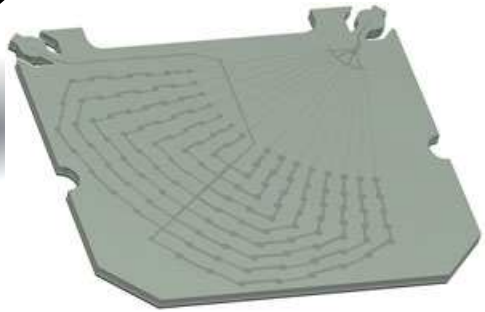
Save of ~60 % Acetonitrile

Agilent 1290 Infinity LC Beta Test

Binary Pump







Microfluidic Mixing

Jet Weaver Mixer (35ul)

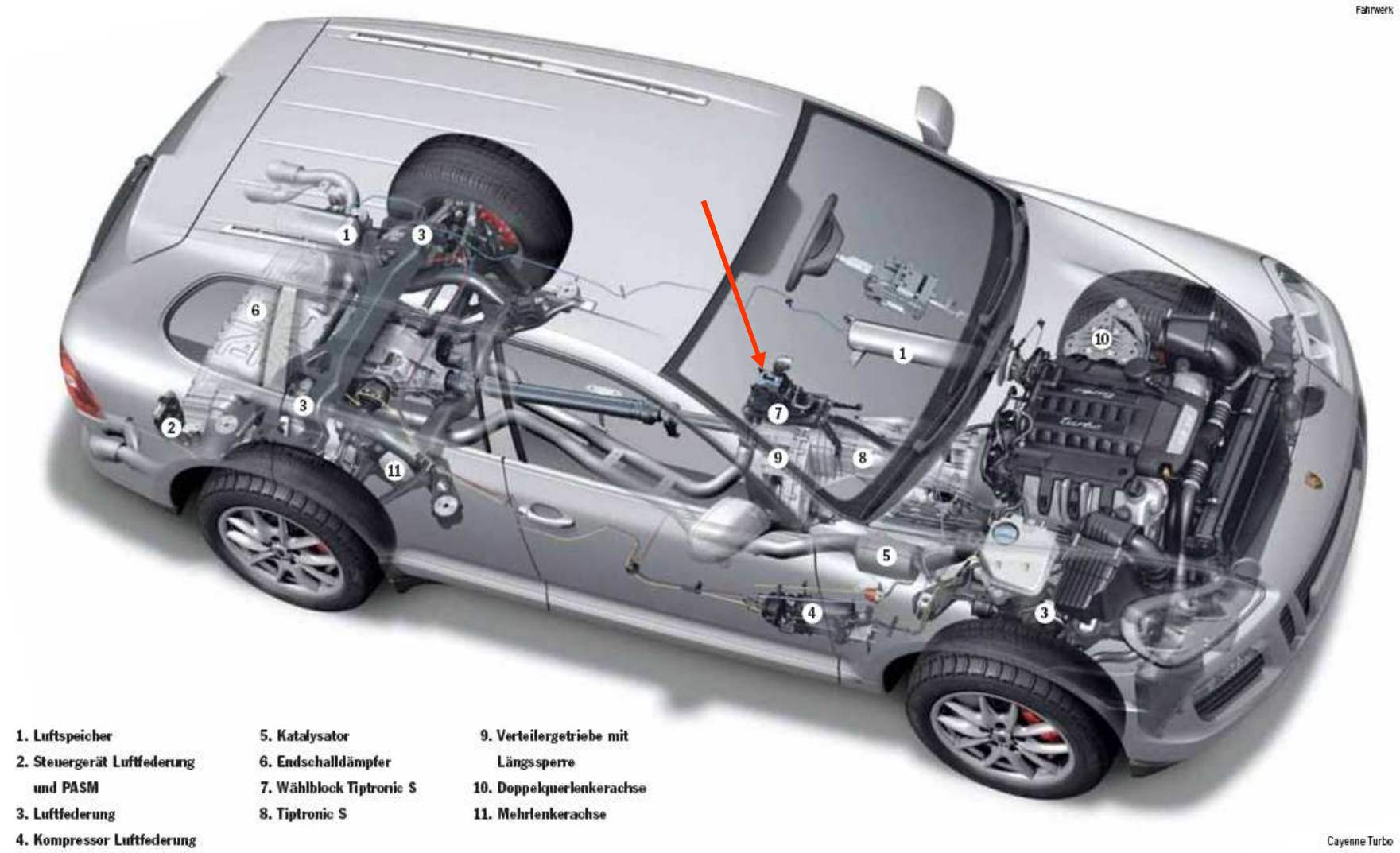
=

10µl / 45µl DV:
- **20 - 80x lower**

Lowest Noise
- **< 50%**

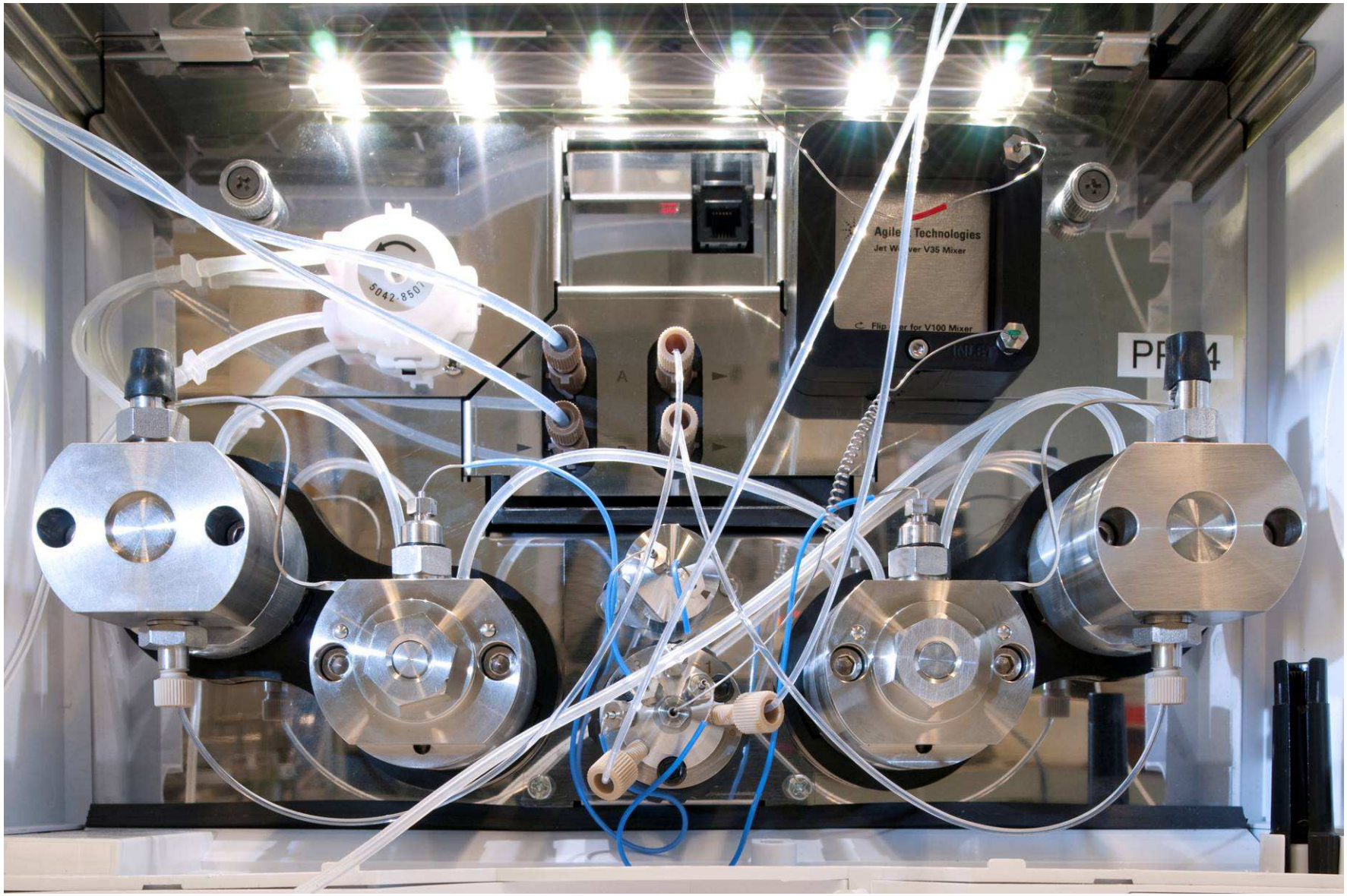
Agilent 1290 Infinity Binary Pump

Maximum Power and Robustness



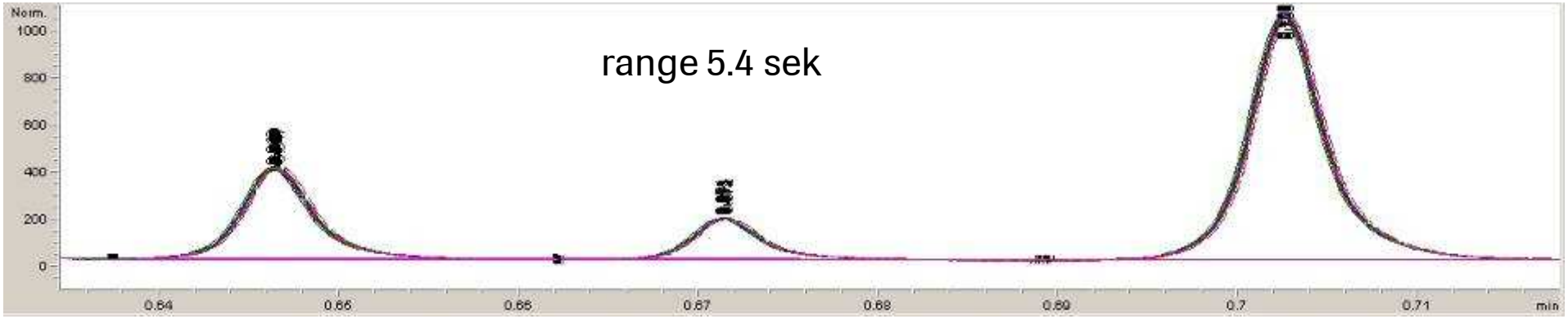
1. Luftspeicher
2. Steuergerät Luftfederung und PASM
3. Luftfederung
4. Kompressor Luftfederung
5. Katalysator
6. Endschalldämpfer
7. Wählblock Tiptronic S
8. Tiptronic S
9. Verteilergetriebe mit Längssperre
10. Doppelquerlenkerachse
11. Mehrlenkerachse

Binary Pump

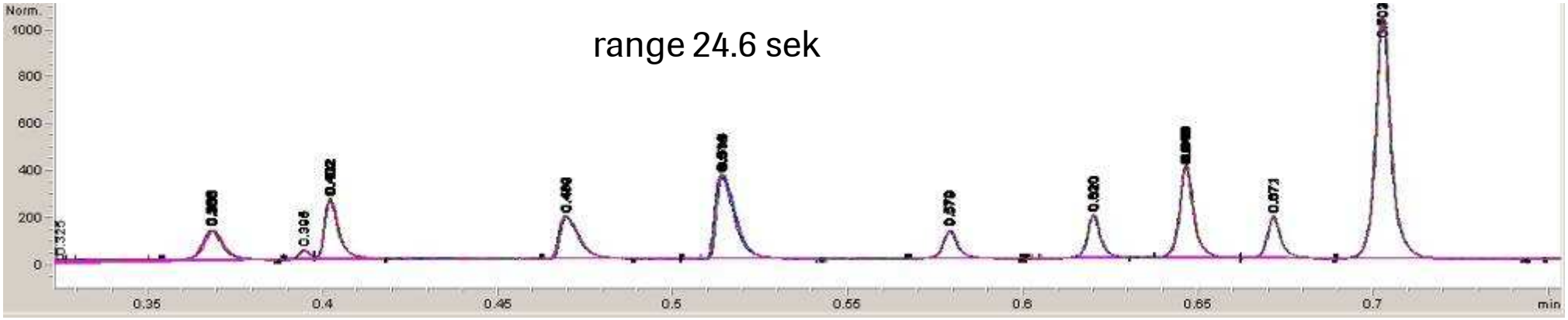


Binary Pump
Reproducibility

Overlay 20x



Overlay 30x

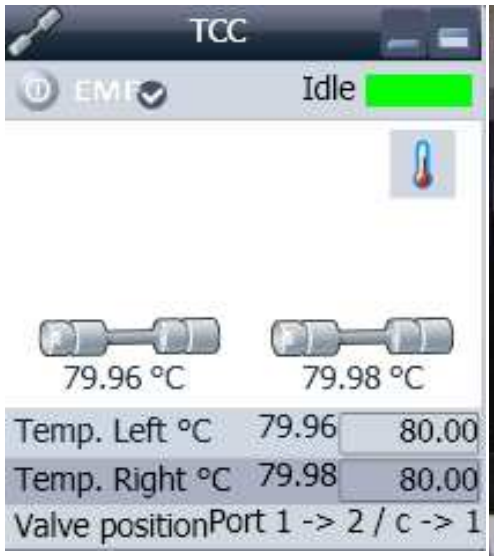


Agilent 1290 Infinity LC Beta Test

Autosampler

Agilent 1290 Infinity LC Beta Test

Thermostatted Column Compartment



Test conditions

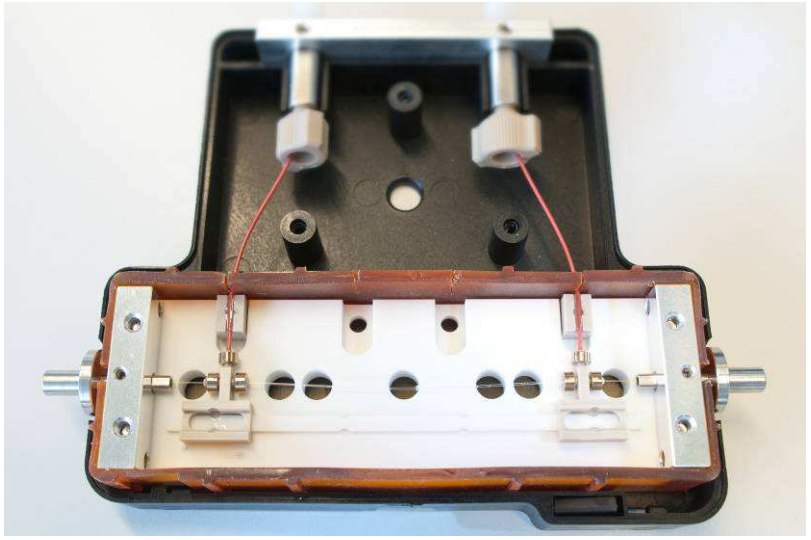
- ➢80 °C
- ➢1.6 µl Pre-Heater
- ➢no cooling necessary

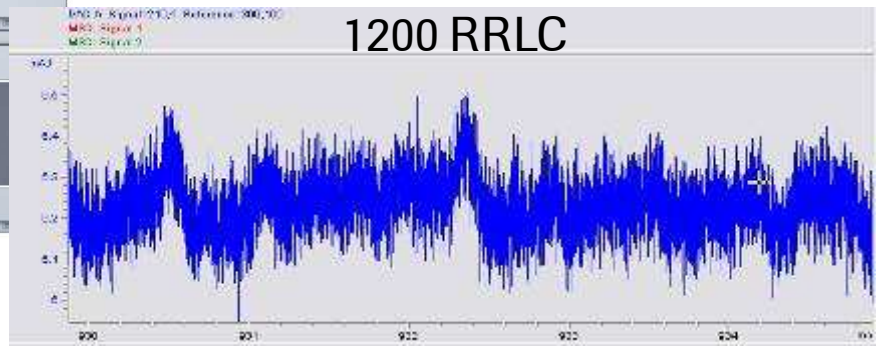
Agilent 1290 Infinity LC Beta Test

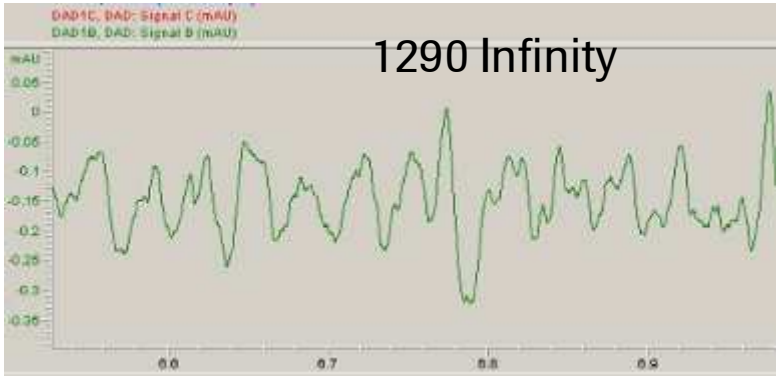
Diode-Array Detector

	WL	BW	RefWL	RefBW	[mAU]
A	210.0	8	off	off	0.0
B	254.0	8	off	off	0.0
C	265.0	8	off	off	0.0
D	220.0	8	off	off	0.0

High Sensitivity flow cell (60 mm)

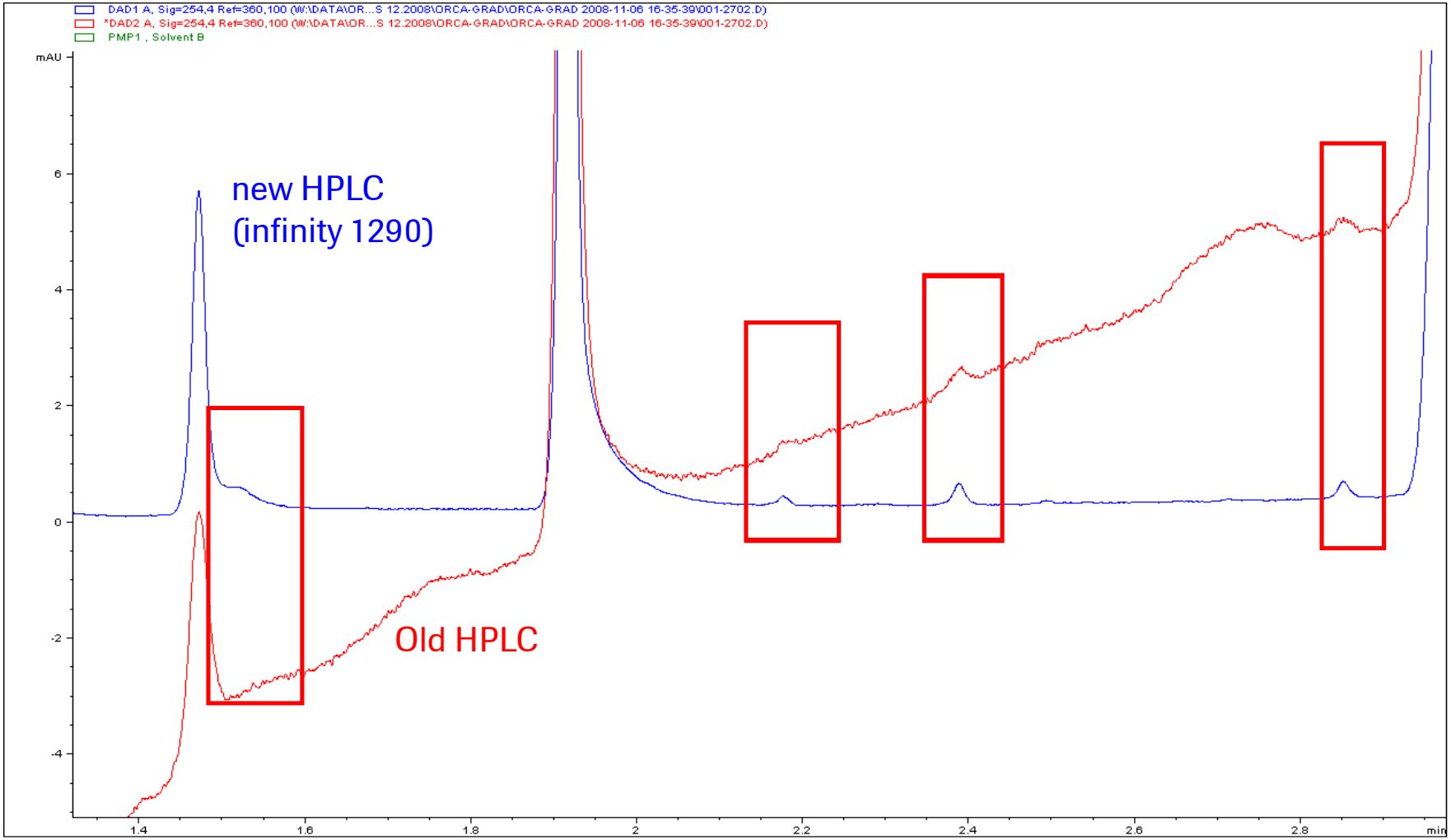






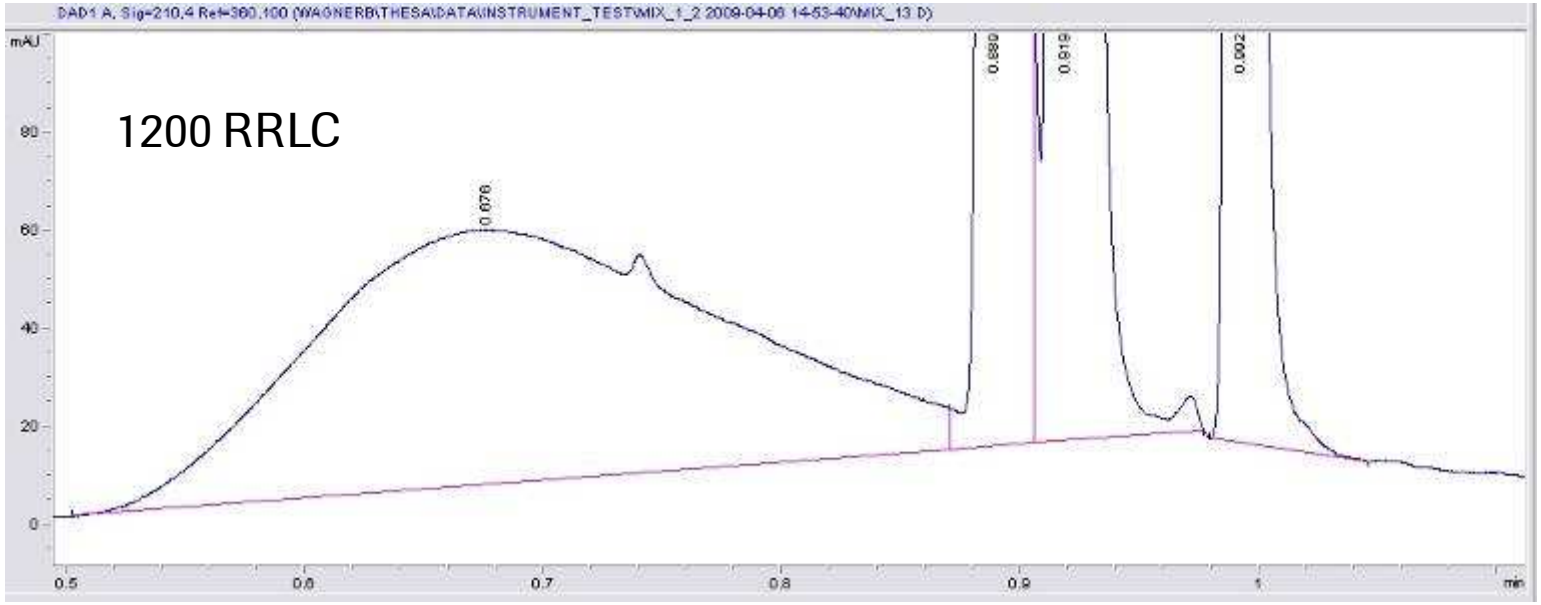
Diode-Array Detector

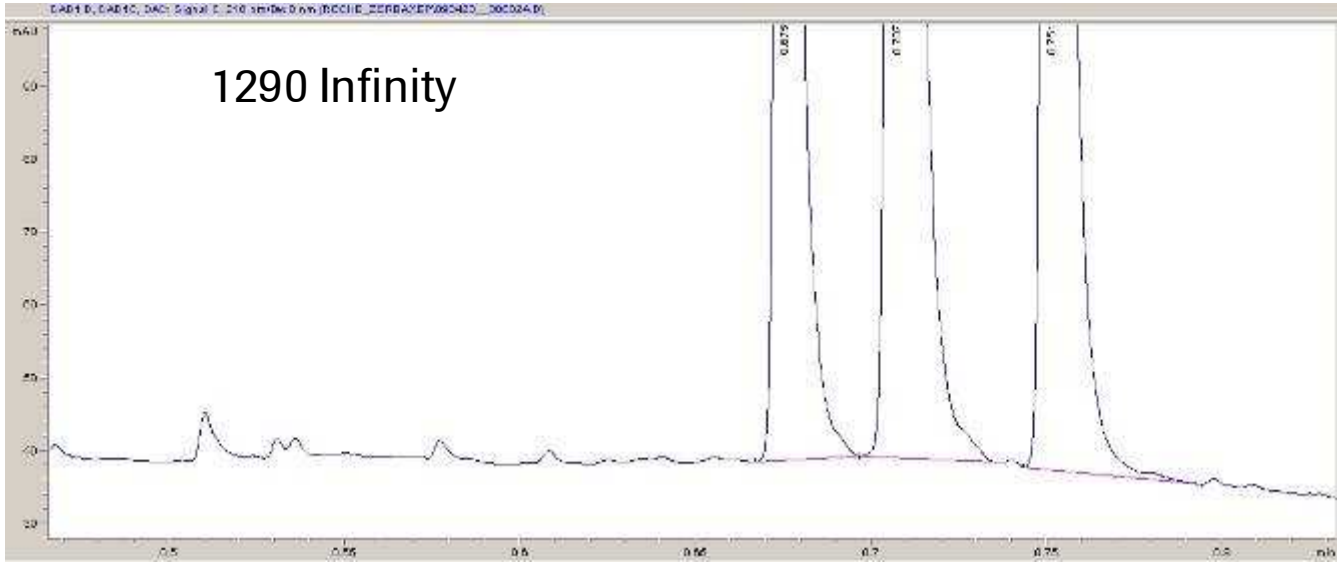
Baseline rubustness



Diode-Array Detector

Baseline rubustness

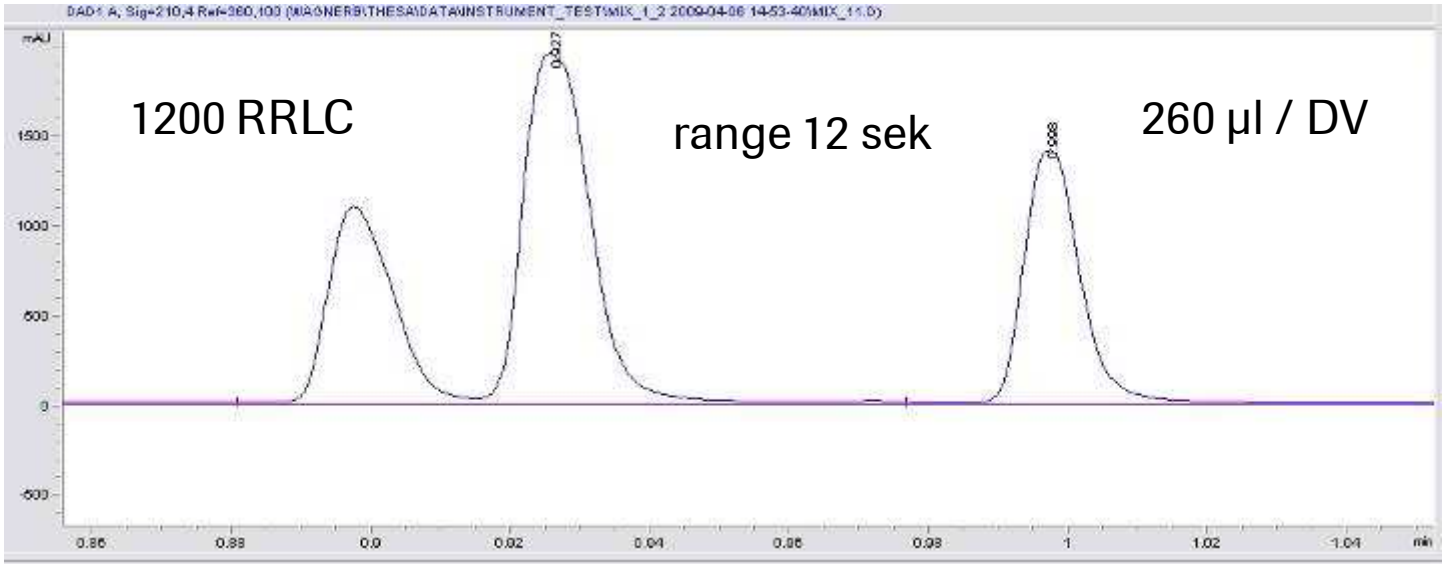


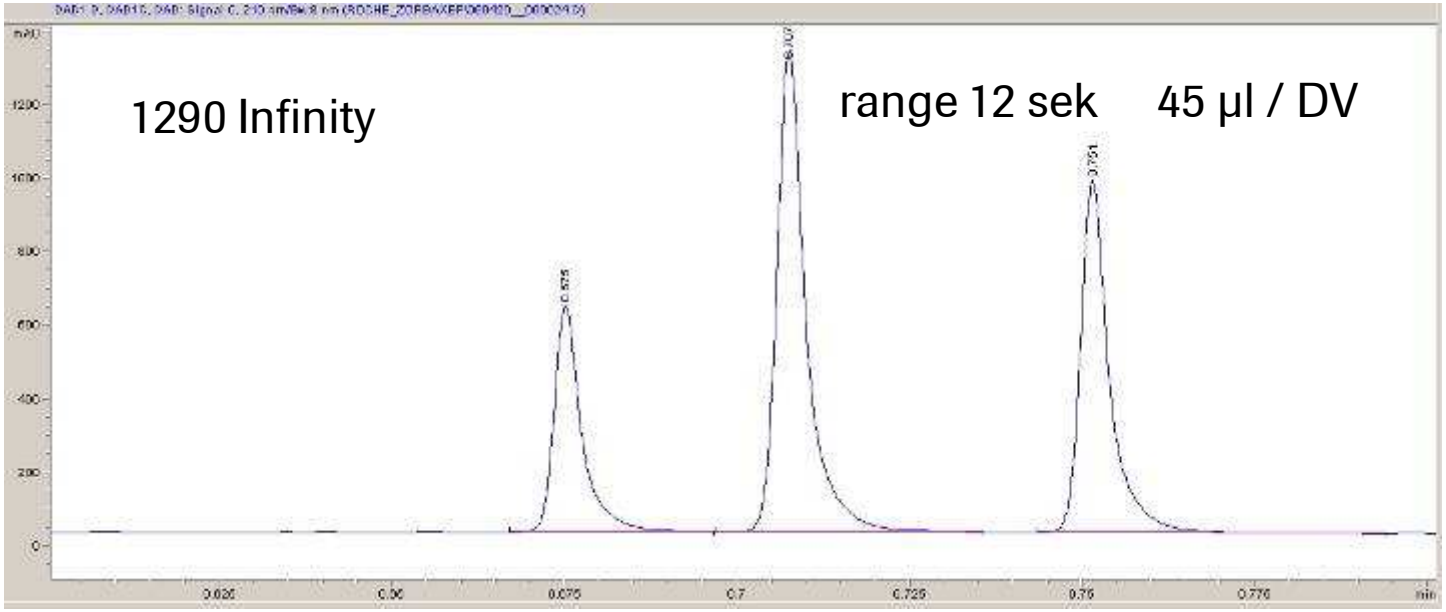


Zorbax Eclipse Plus C18
2.1x50mm 1.8 um
Flow rate: 1.5 ml/min (5-95 % ACN)
Temp: 80 °C
Data rate: 80Hz, 210 nm

Diode-Array Detector

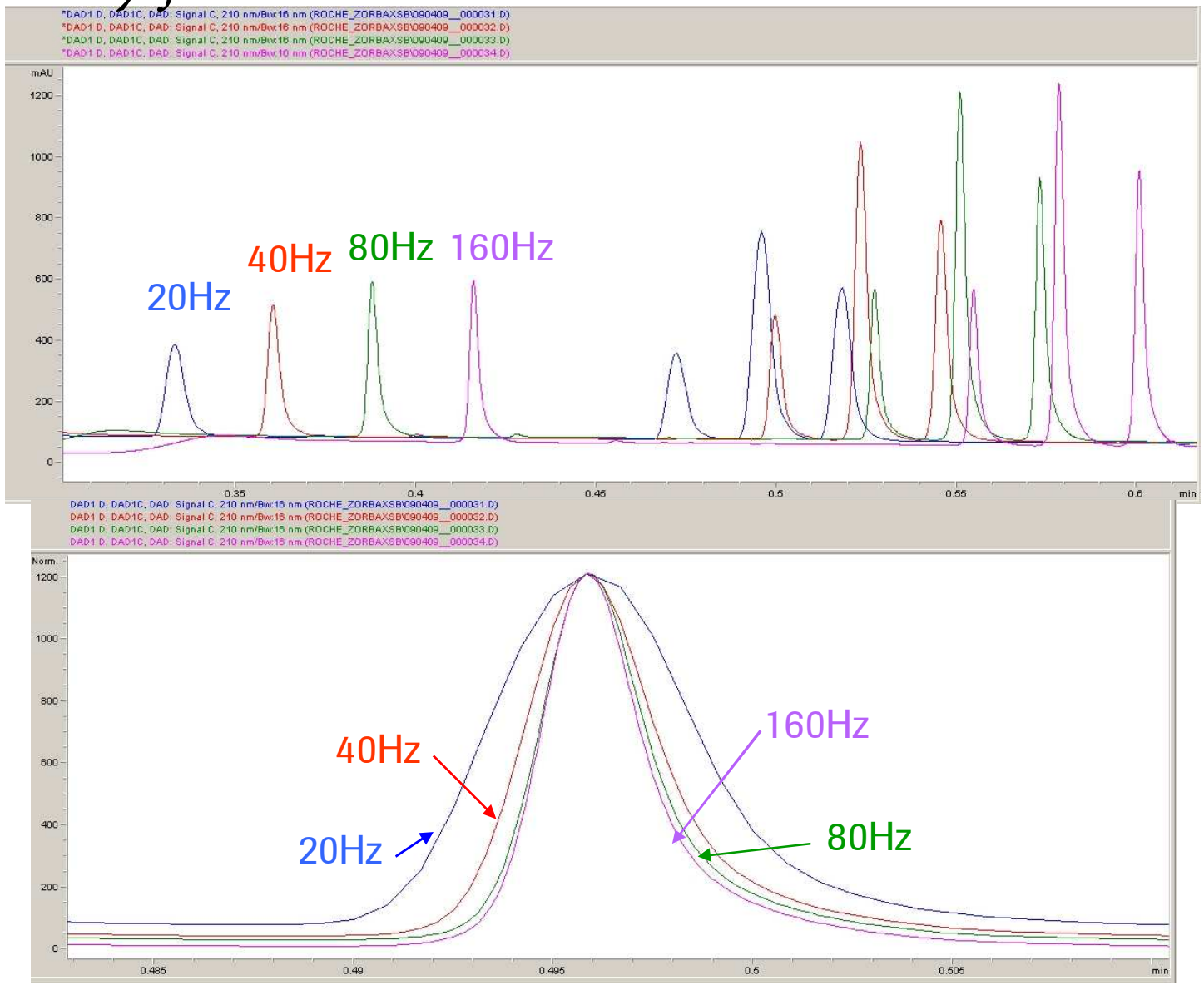
Peakform with standard cells





Diode-Array Detector

Sensitivity from 20 Hz-160 Hz



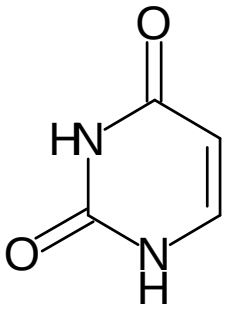
Agilent 1290 Infinity LC Beta Test

Column test

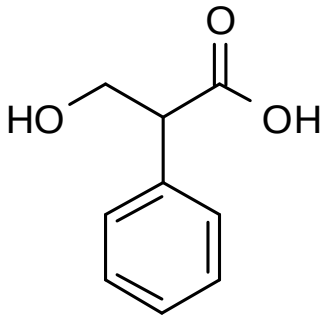
Summary

- **Column test:**

  Testmixture 2

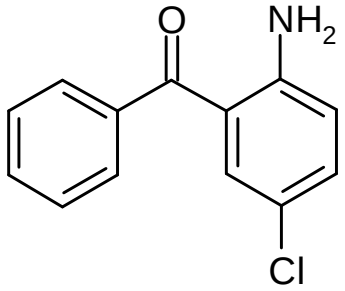


Uracil
Peak 1



Tropic acid
Peak 2

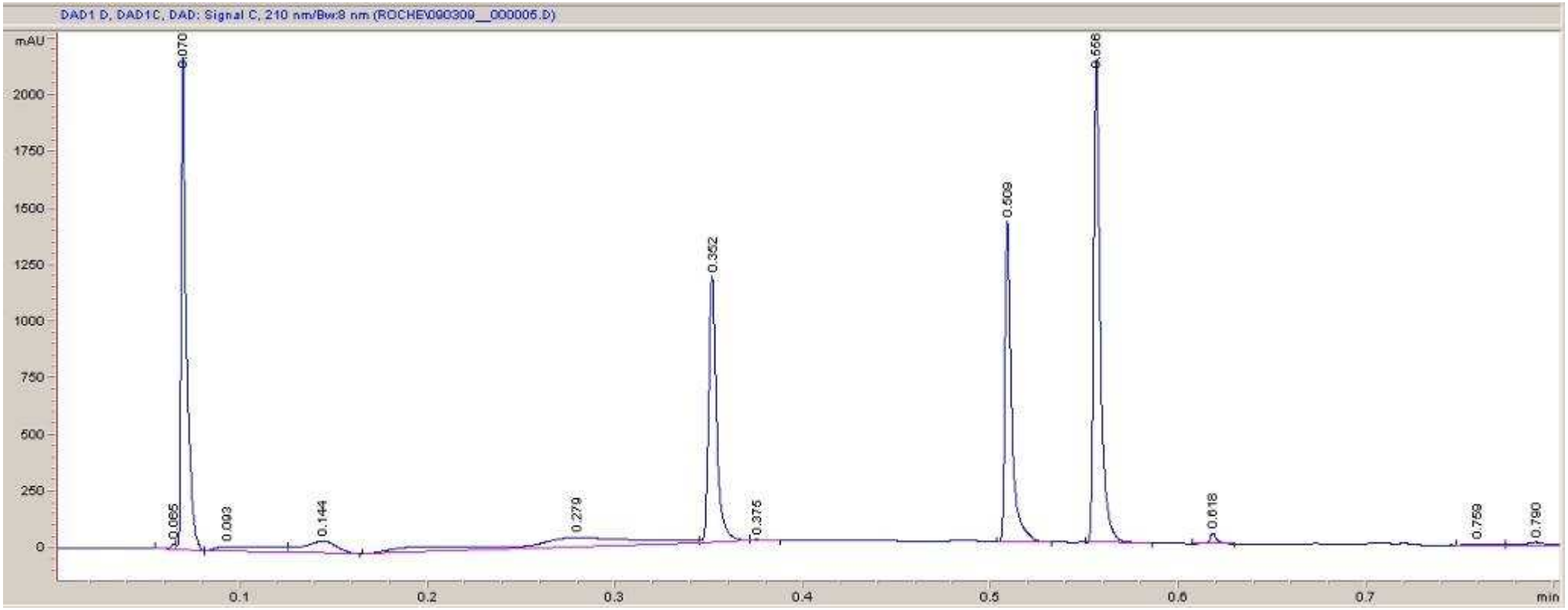
(+)-Bibenzyl-L-tatrate
Peak 3



2-Amino-5-chlorobenzophenone
Peak 4

Waters Acquity BEH C18 2.1 x 50mm 1.7 µm

Flow 2 ml, 700 bar, 80°C, 210 nm (80 Hz), Inj. 1.0 µl
Gradient: Water (0.05% Formic acid) / 2-95 % Acetonitrile

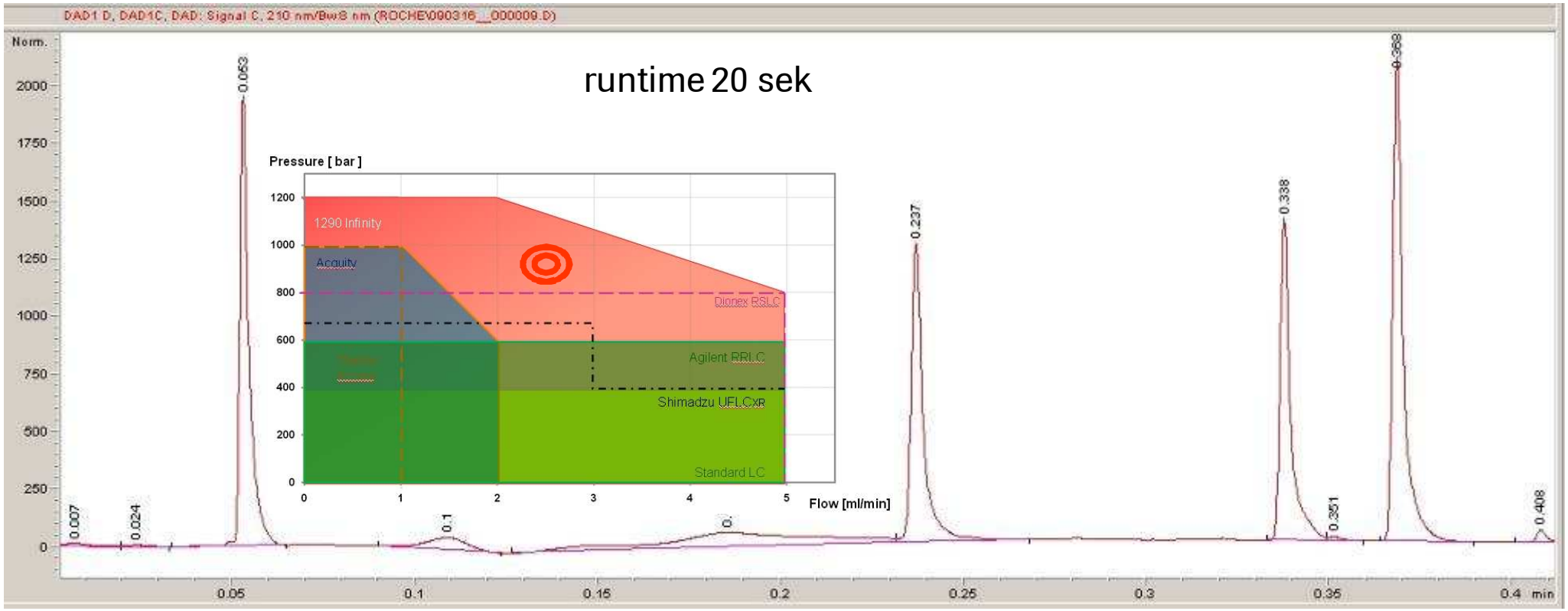


Ultra Fast LC Conditions

Acquity BEH C18 2.1 x 50mm 1.7 µm

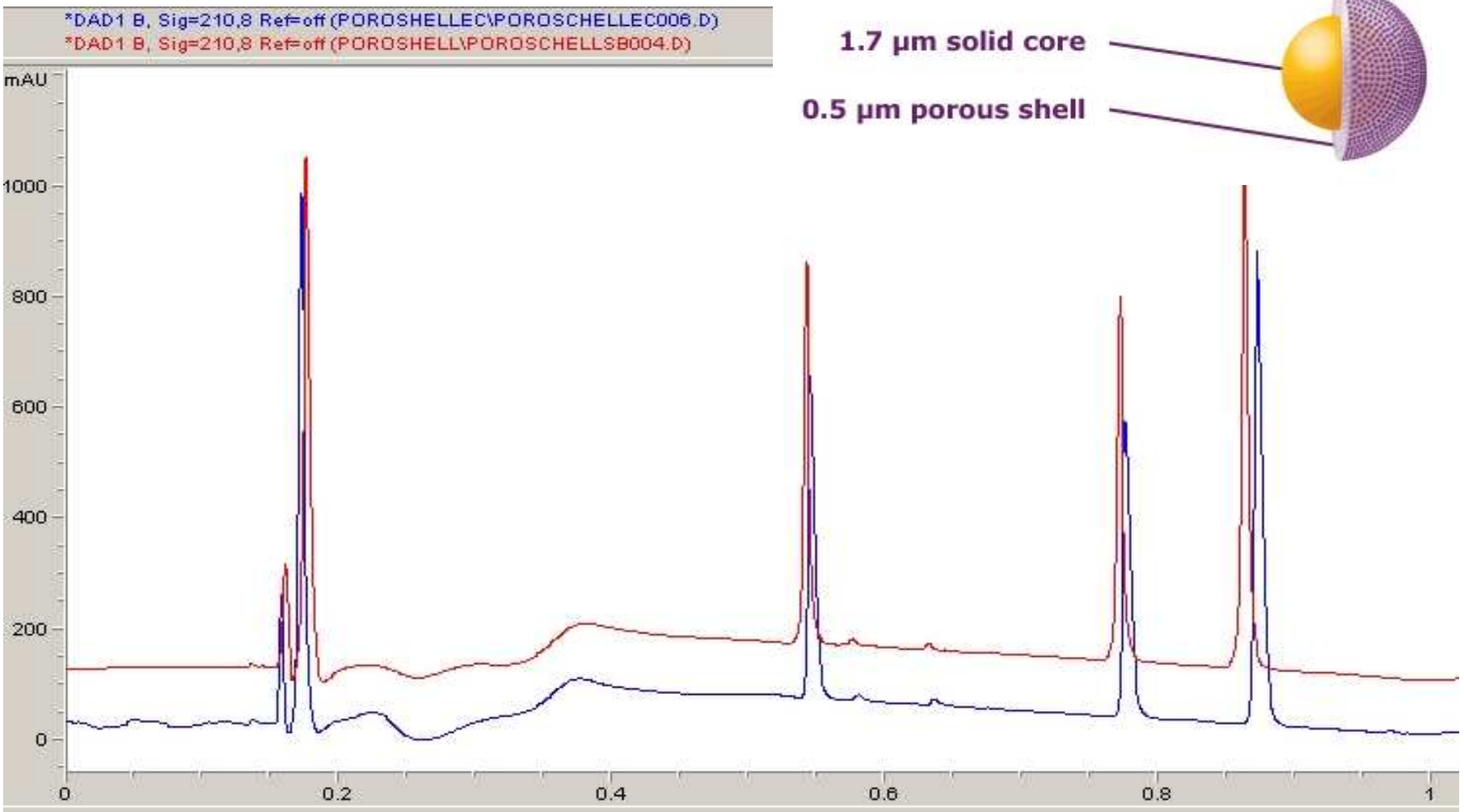
Flow 2.5 ml, 930 bar, 80°C, 210 nm (80 Hz), Inj. 1 µl

Gradient: Water (0.05% Formic acid) / 2-95 % Acetonitrile



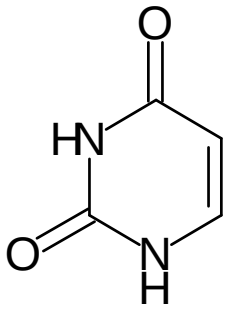
Agilent Poroshell 120 SB + EC C18 3.0 x 50mm 2.7 µm

Flow 1.5 ml, 200 bar SB, 230 bar EC, 60°C, 210 nm (80 Hz), Inj. 1.0 µl
Gradient: Water (0.05% Formic acid) / 2-95 % Acetonitrile

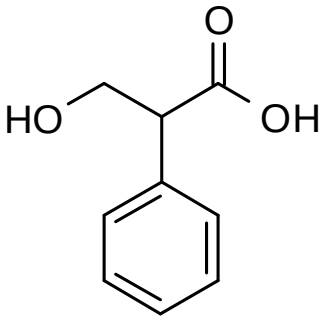


- **Column test:**

  Testmixture 1

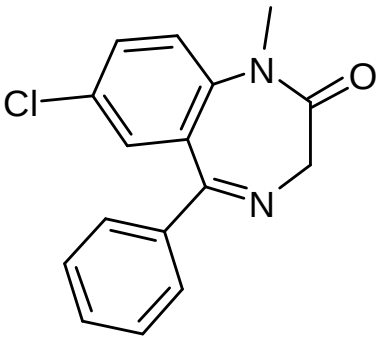


Uracil
Peak 1

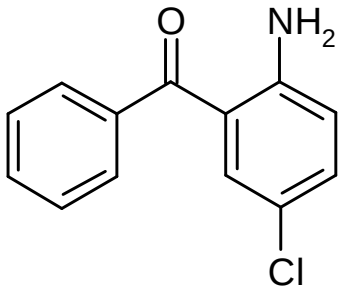


Tropic acid
Peak 2

(+)-Bibenzyl-L-tatrate
Peak 3



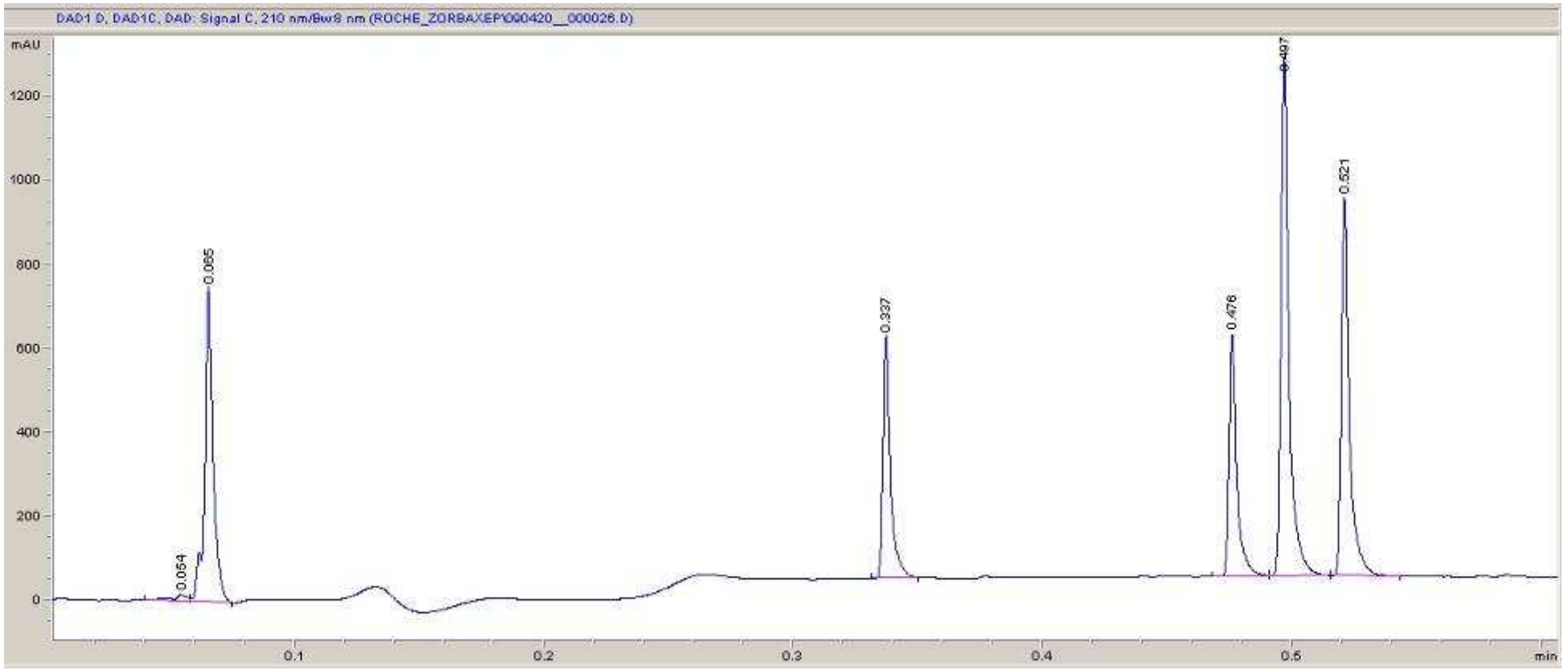
Diazepam
Peak 4



2-Amino-5-chlorobenzophenone
Peak 5

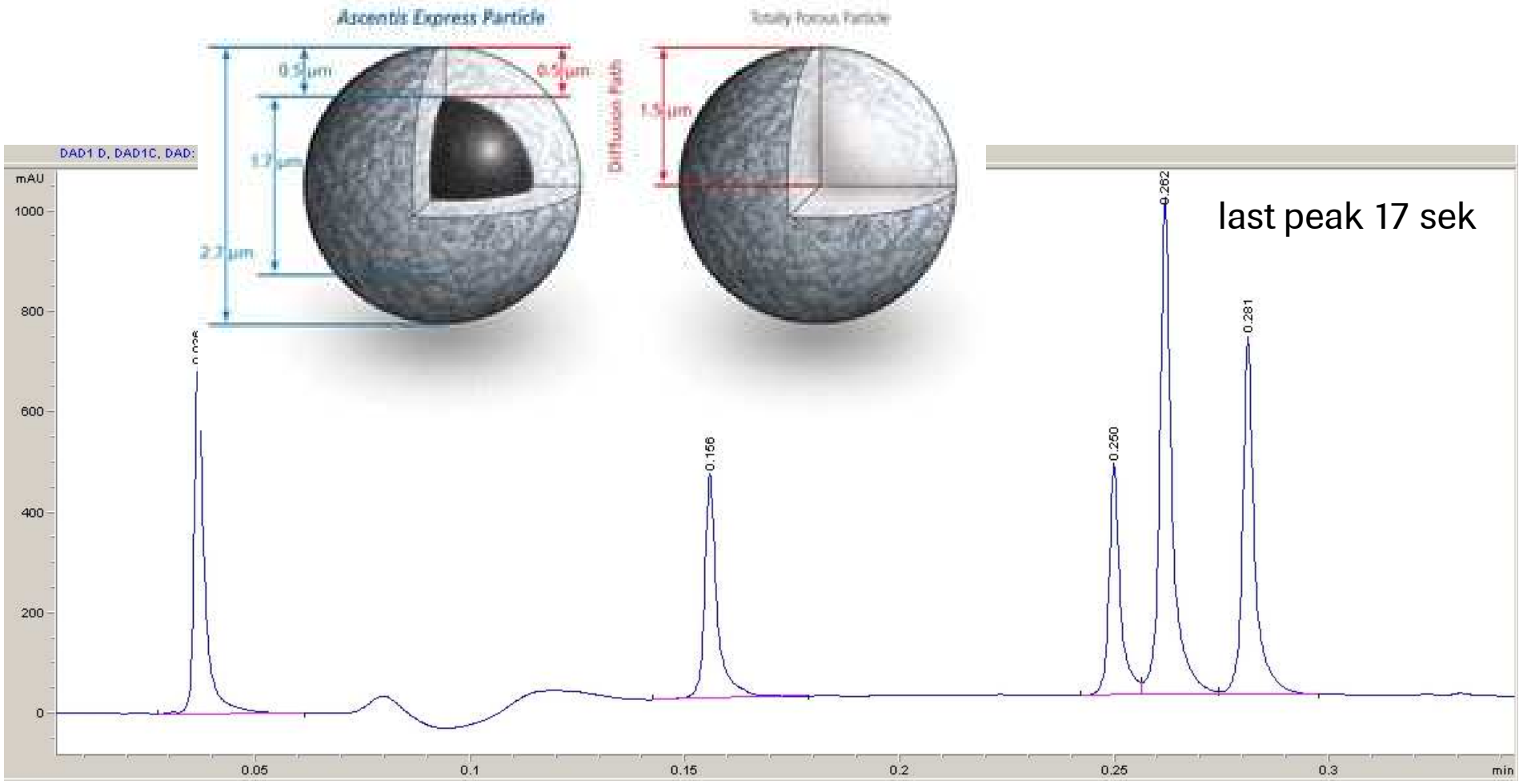
Agilent Zorbax Eclipse Plus 2.1x50mm, 1.8 µm

Flow 2 ml, 700 bar, 80°C, 210 nm (80 Hz), Inj. 0.5 µl
Gradient: Water (0.05% Formic acid) / 2-95 % Acetonitrile



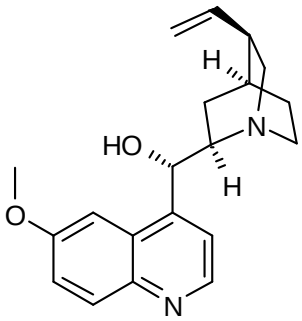
Supelco Ascentis Express C18 2.1 x 50mm 2.7 µm

Flow 3.2 ml, 585 bar, 80°C, 210 nm (80 Hz), Inj. 0.5 µl
Gradient: Water (0.05% Formic acid) / 2-95 % Acetonitrile

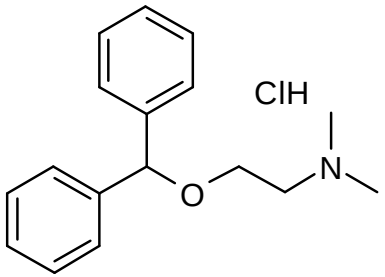


- **Column test:**

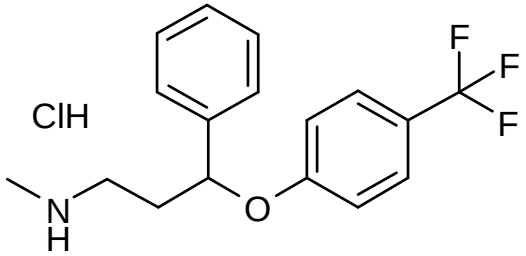
  Testmixture 3



Quinidine
Peak 1

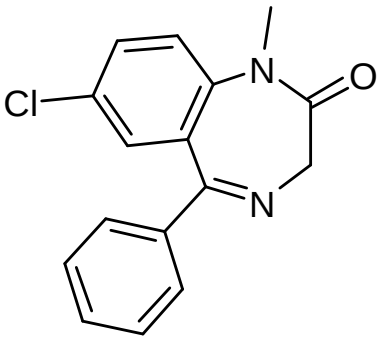


Diphenylhydramine HCl
Peak 2

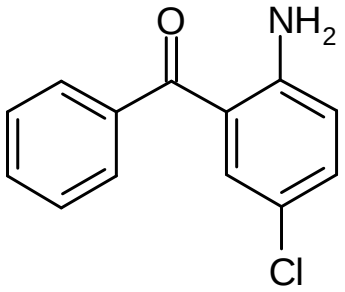


Fluoxetine HCl
Peak 3

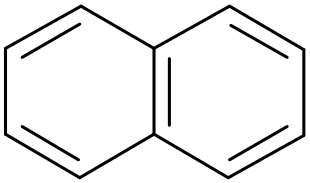
(+)-Bibenzyl-L-tatrate
Peak 4



Diazepam
Peak 5



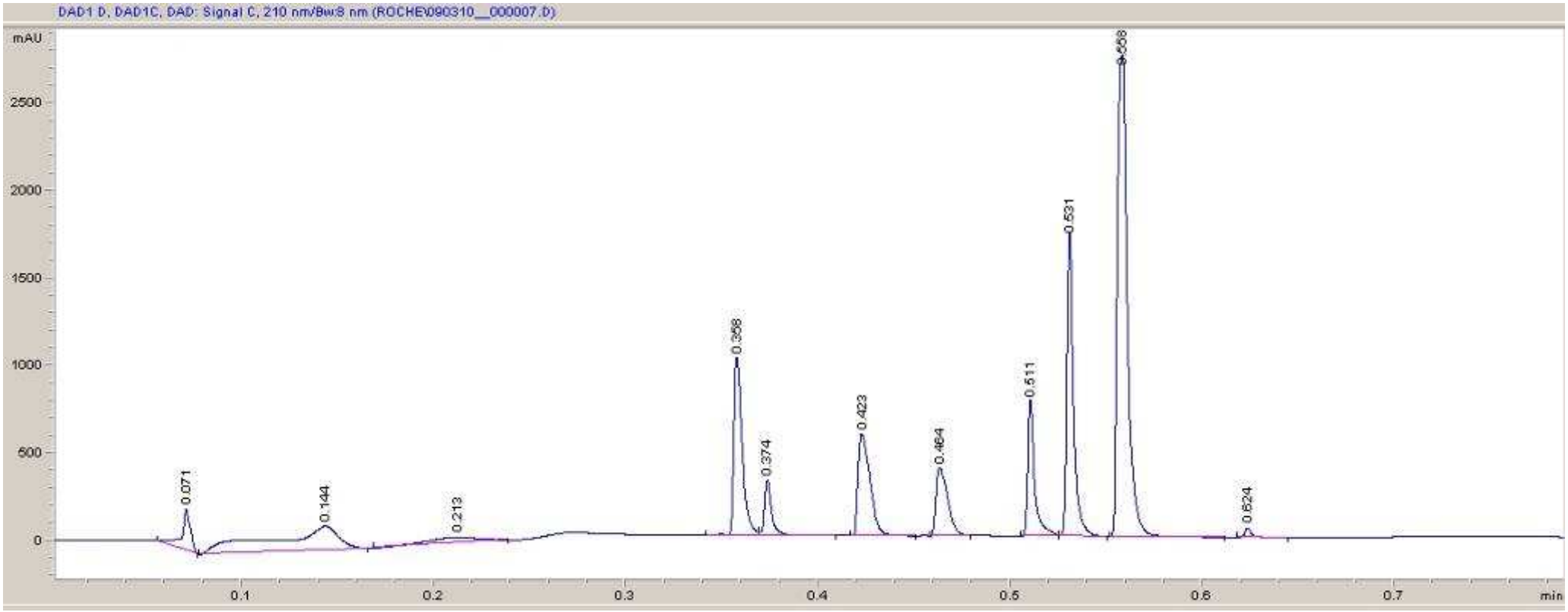
2-Amino-5-chlorobenzophenone
Peak 6



Naphthalene
Peak 7

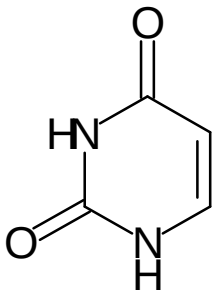
Waters Acquity BEH C18 2.1 x 50mm 1.7 µm

Flow 2 ml, 700 bar, 80°C, 210 nm (80 Hz), Inj. 1 µl
Gradient: Water (0.05% Formic acid) / 2-98 % Acetonitrile

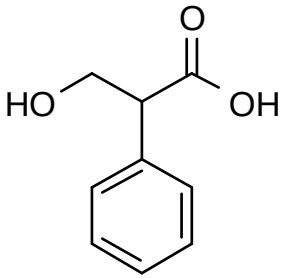


- **Column test:**

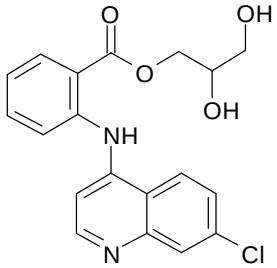
  Testmixture 6



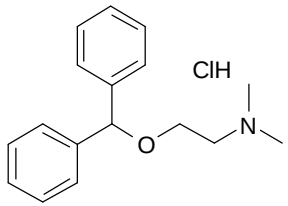
Uracil
Peak 1



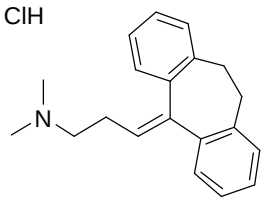
Tropic acid
Peak 2



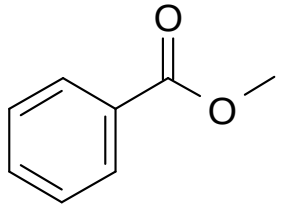
Glafenine
Peak 3



Diphenhydramine.HCl
Peak 4

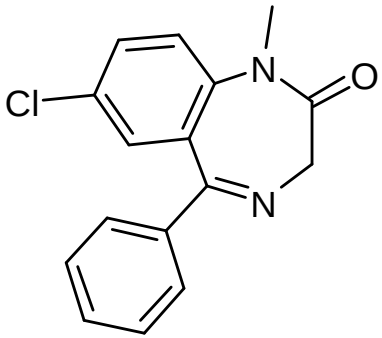


Amitriptyline.HCl
Peak 5

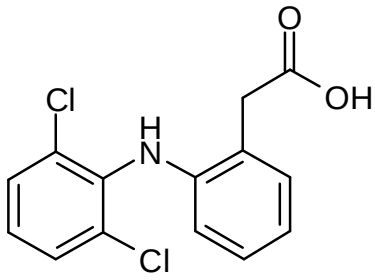


Methyl benzoate
Peak 6

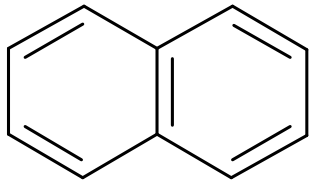
(+)-Bibenzyl-L-tatrate
Peak 7



Diazepam
Peak 8



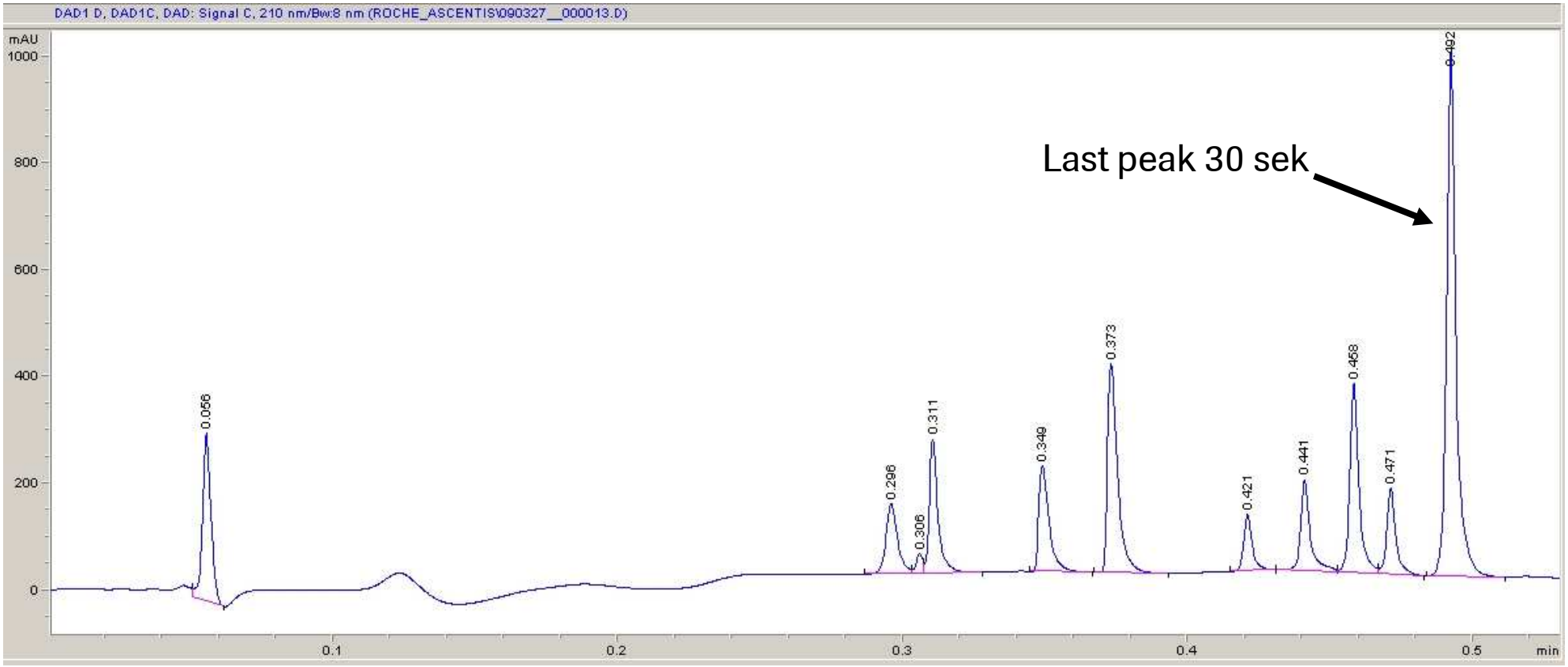
Diclofenac
Peak 9



Naphthalene
Peak 10

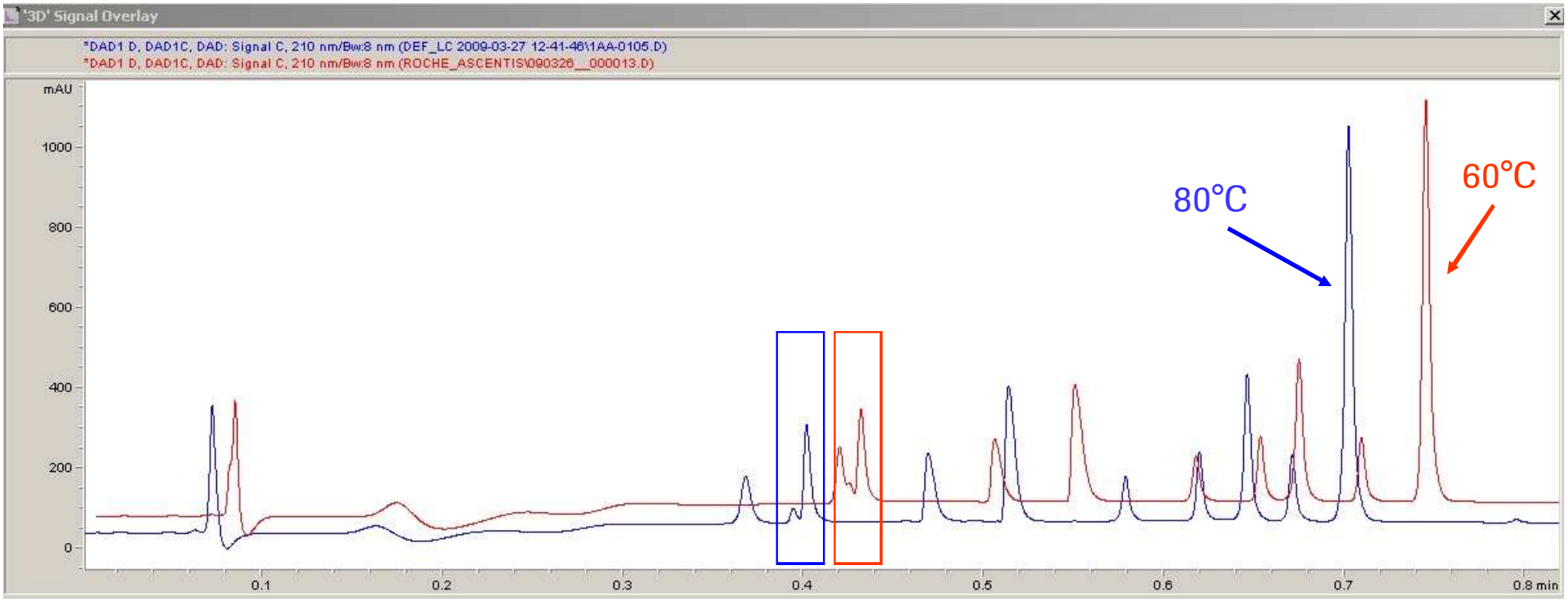
Supelco Ascentis Express C18 2.1 x 50mm 2.7 µm

Flow 2.0 ml, 430 bar, 80°C, 210 nm (80 Hz), Inj. 0.5 µl
Gradient: Water (0.05% Formic acid) / 2-98 % Acetonitrile



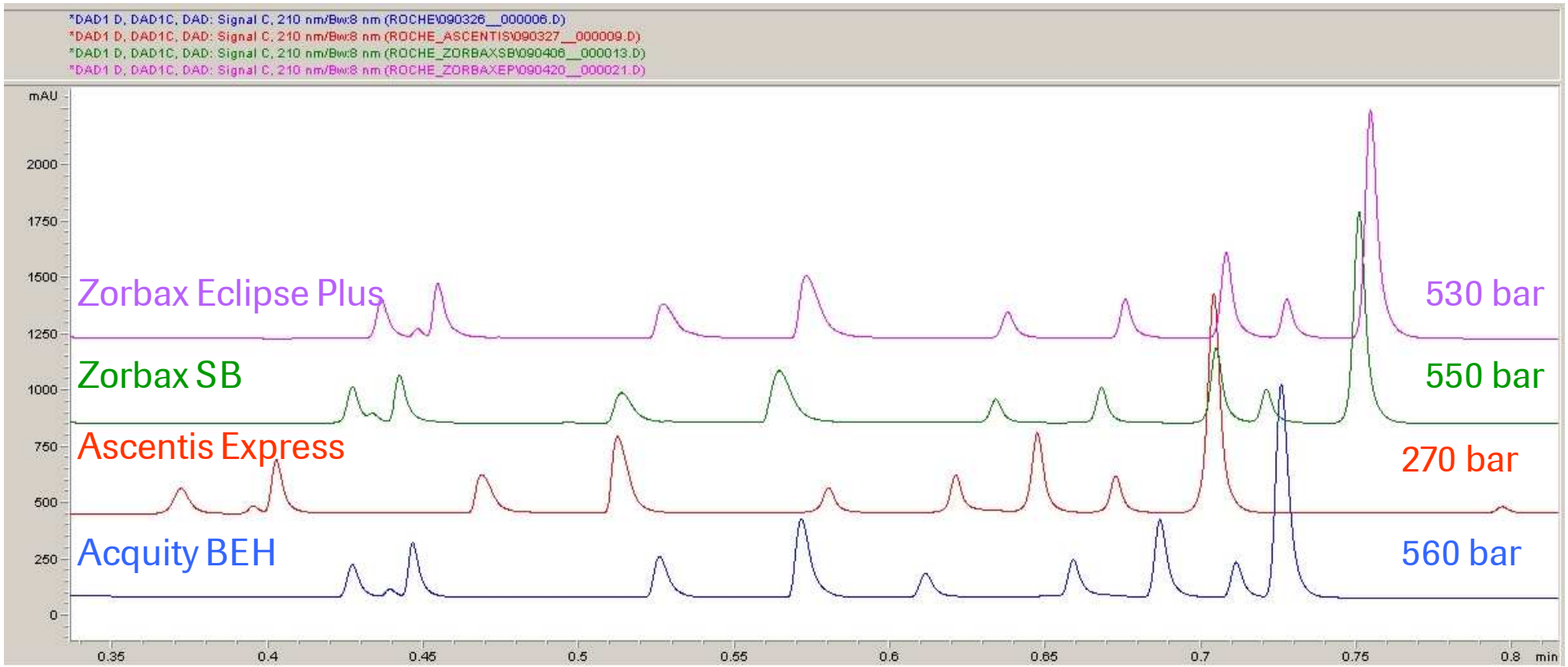
Supelco Ascentis Express C18 2.1 x 50mm 2.7 µm

Flow 1.5 ml, ~480 bar, 60°C and 80°C, 210 nm (80 Hz), Inj. 0.5 µl
Gradient: Water (0.05% Formic acid) / 2-98 % Acetonitrile



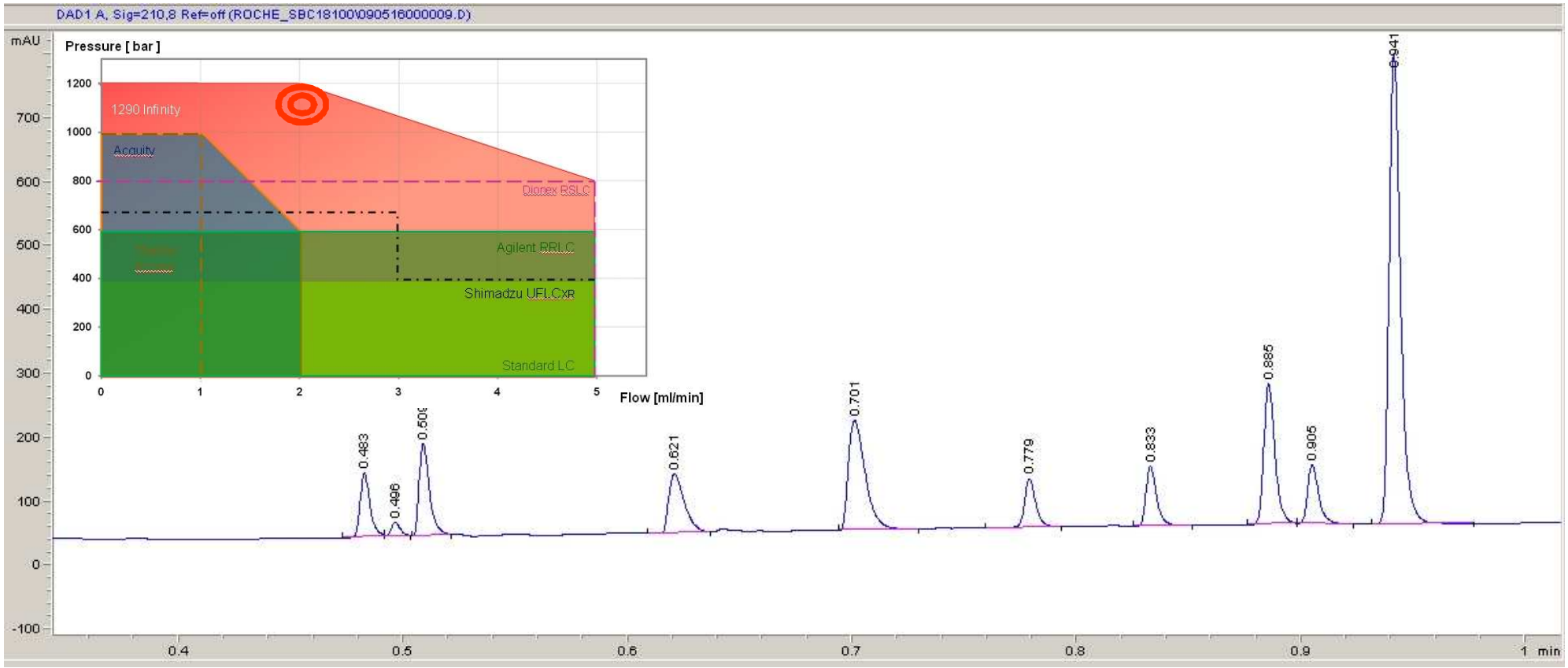
Comparison of different suppliers 2.1 x 50mm

Flow 1.5 ml, 80°C, 210 nm (80 Hz), Inj. 0.5 µl
Gradient: Water (0.05% Formic acid) / 2-98 % Acetonitrile



Agilent Zorbax SB C18 2.1 x 100mm 1.8 µm

Flow 2.0 ml, 1085 bar, 80°C, 210 nm (80 Hz), Inj. 0.5 µl
Gradient: Water (0.05% Formic acid) / 2-98 % Acetonitrile

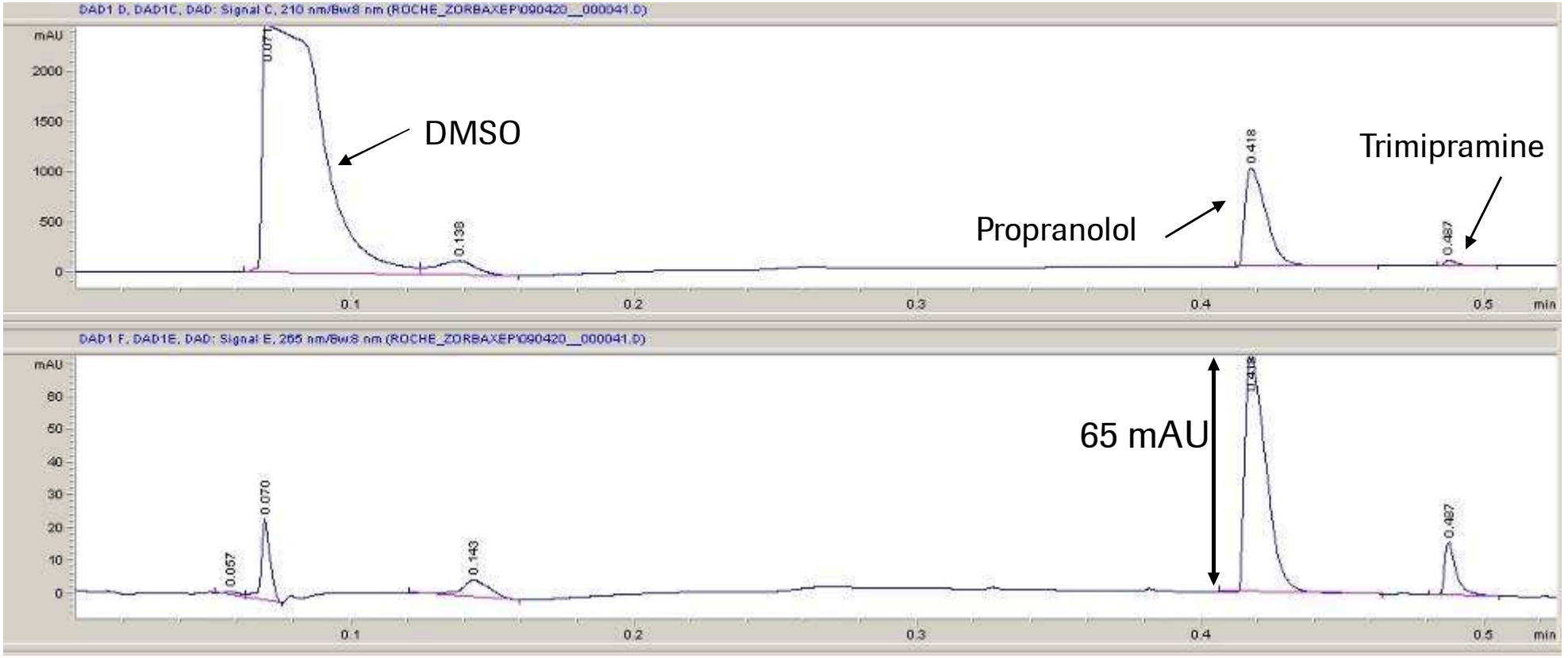


Sample from hightroughput group

Agilent Zorbax Eclipse Plus 2.1 x 50mm 1.8 µm

Flow 2.5 ml, 900 bar, 80°C, 210 nm (80 Hz), Inj. 0.5 µl

Gradient: Wasser (0.05% Formicacid) / 2-98 % Acetonitrile

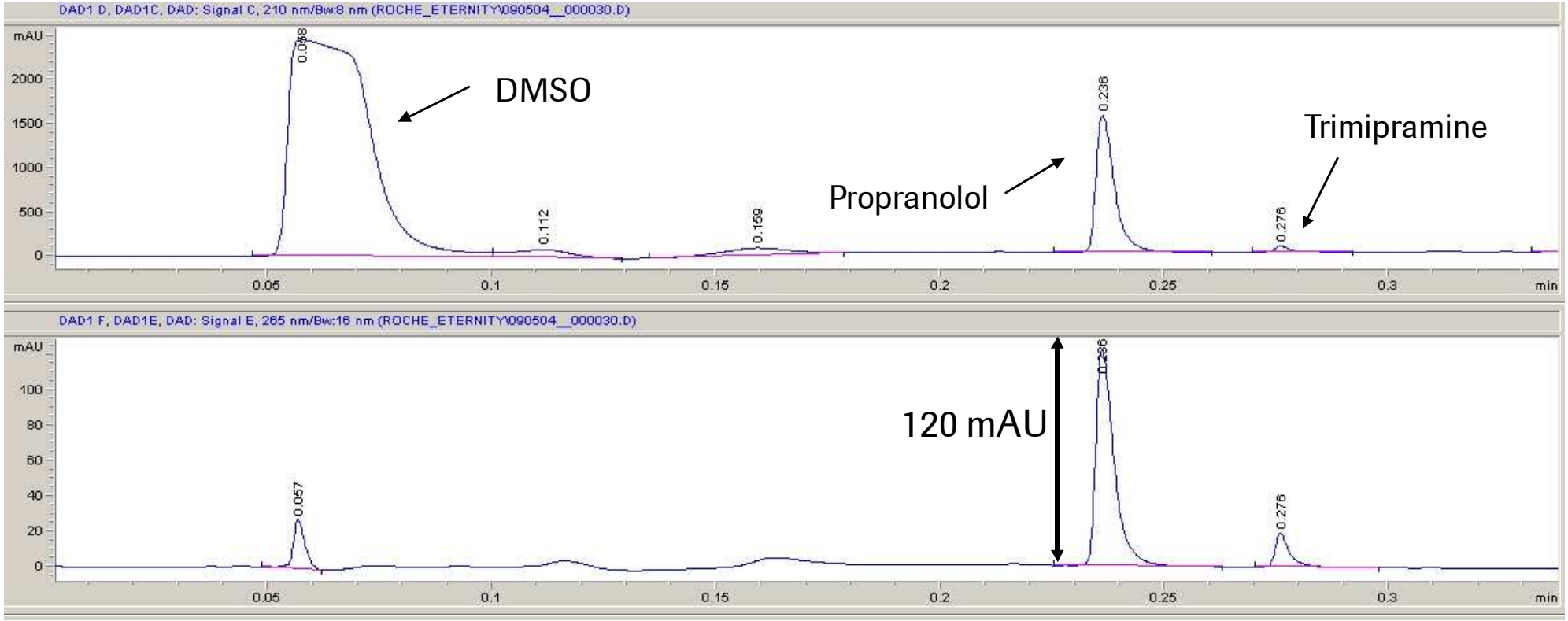


Sample from hightroughput group

Kromasil Eternity C18 2.1 x 50mm 2.5 µm

Flow 2.5 ml, 550 bar, 80°C, 210 nm (80 Hz), Inj. 0.5 µl

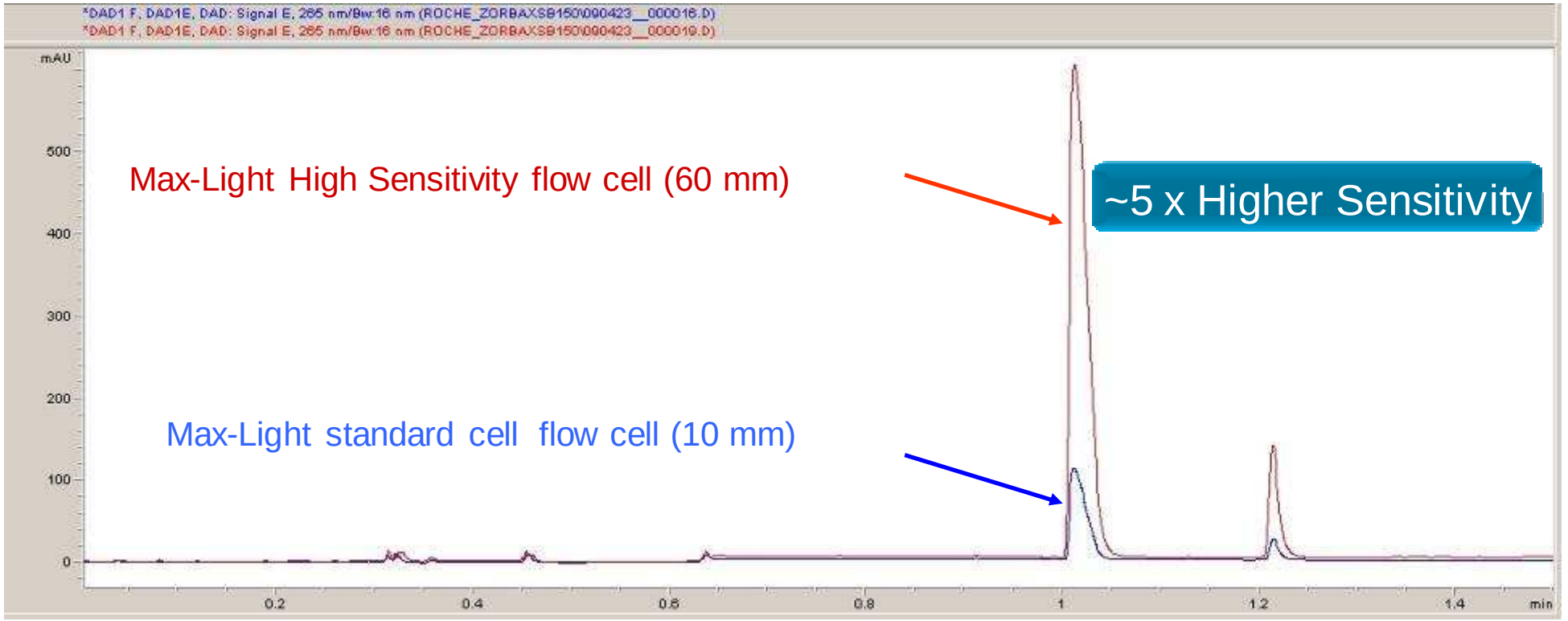
Gradient: Wasser (0.05% Formicacid) / 2-98 % Acetonitrile



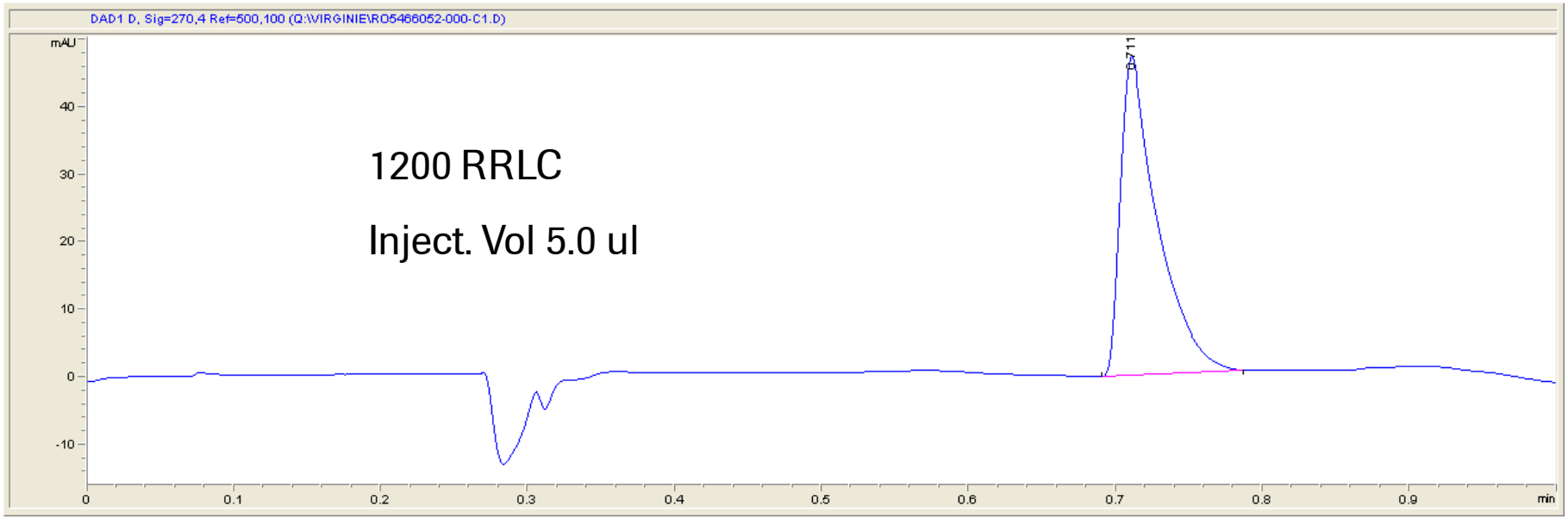
Agilent Zorbax SB C18 2.1 x 150mm 1.8 µm

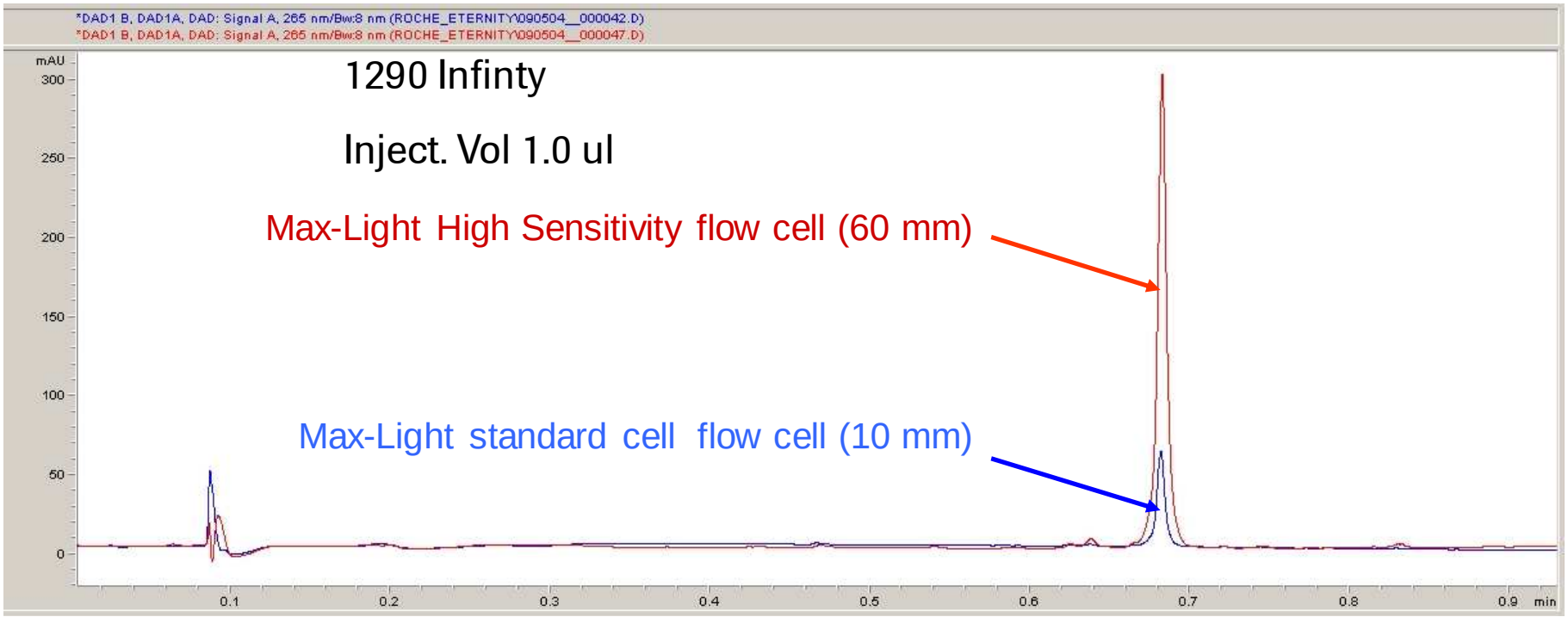
Flow 1.2 ml, 900 bar, 80°C, 210 nm (80 Hz), Inj. 0.5 µl

Gradient: Water (0.05% Formic acid) / 2-98 % Acetonitrile



Sample from hightroughput group (solubility Experiment)



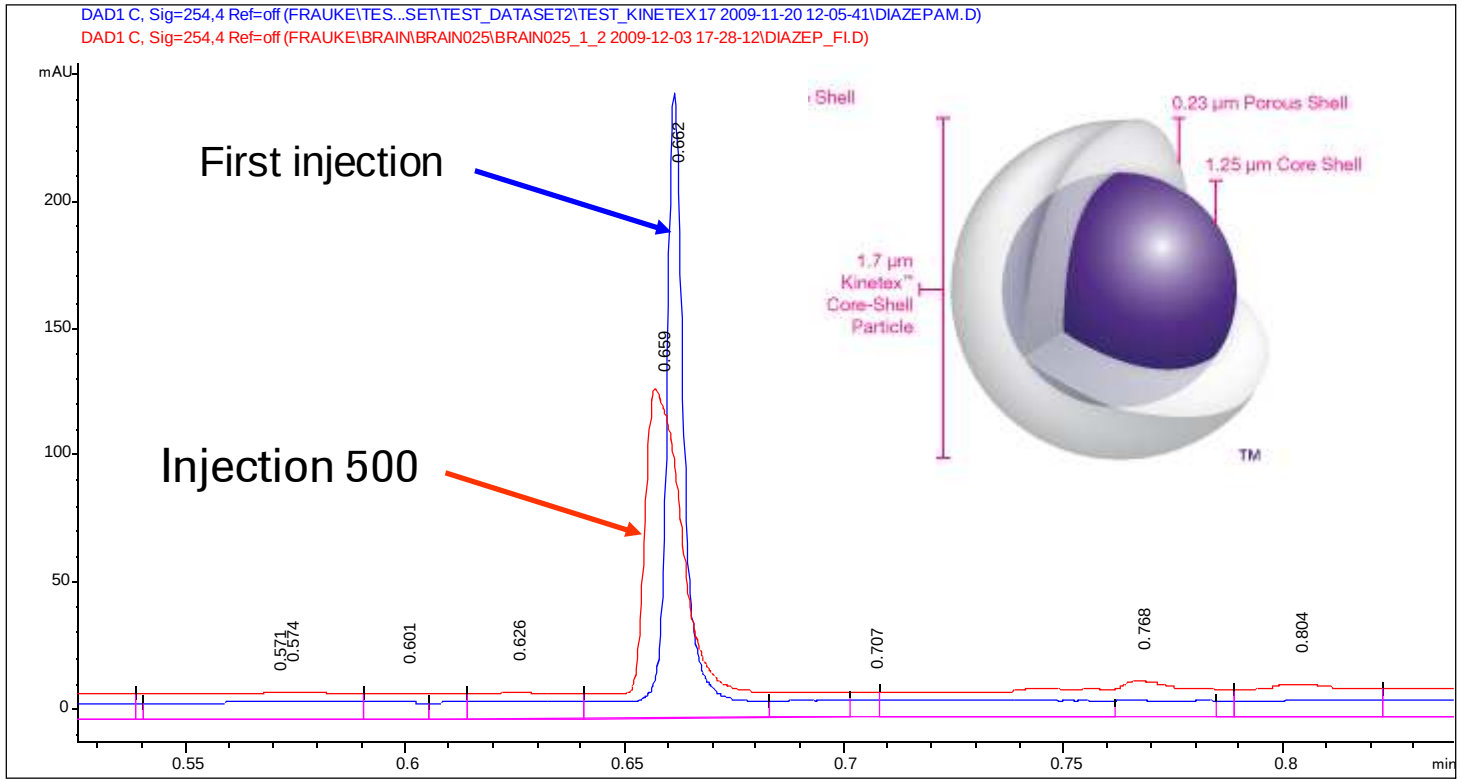


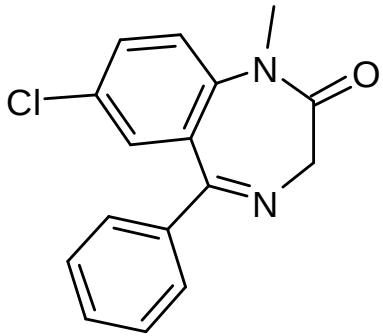
Sample from hightroughput group (column lifetime)

Phenomenex Kinetex C18 2.1 x 50mm 1.7 µm

Flow 1.2 ml, 350 bar, 60°C, 265 nm (80 Hz), Inj. 1.0 µl

Gradient: Water (0.05% Formic acid) / 2-98 % Acetonitrile



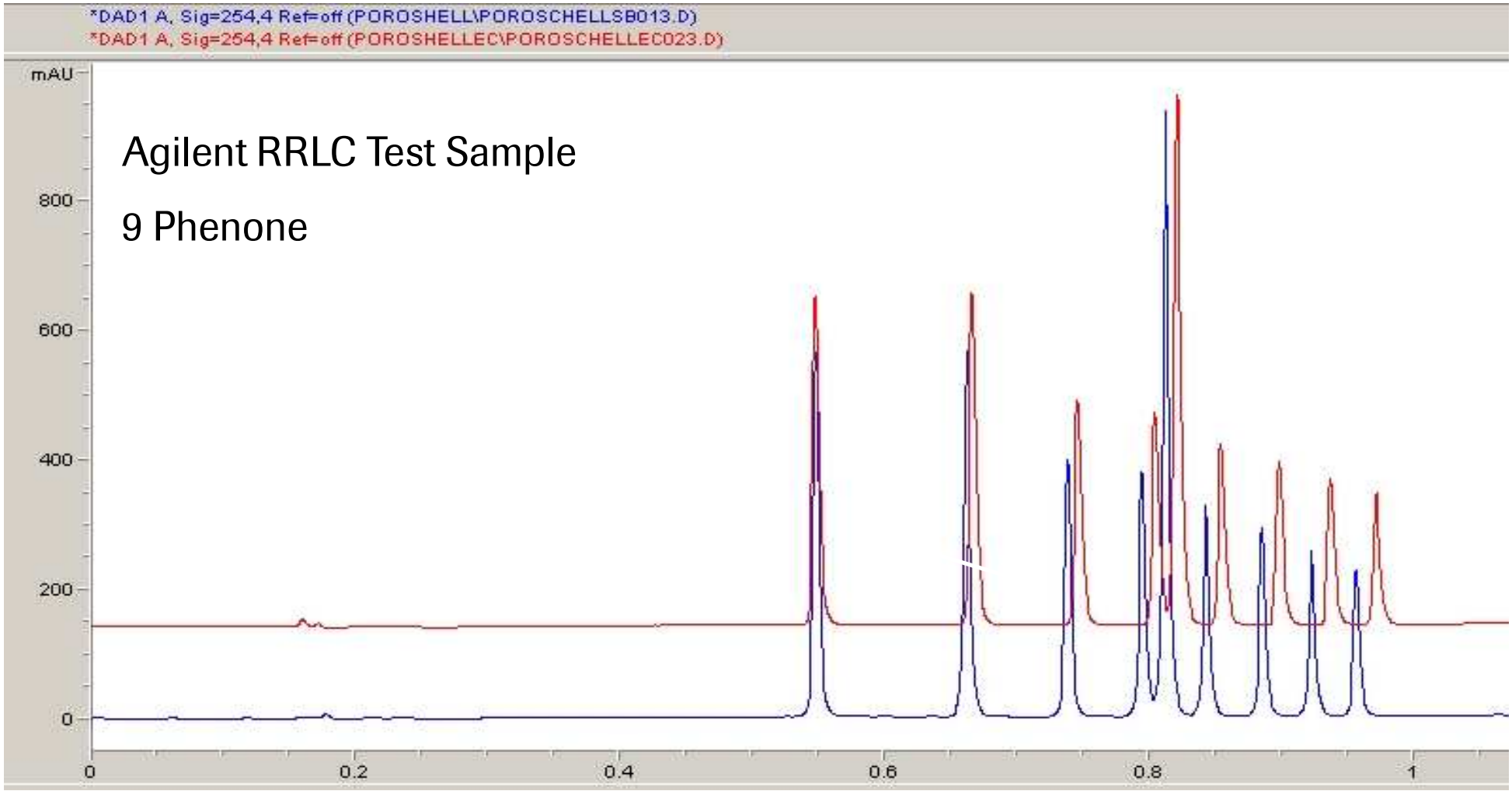


Diazepam

Agilent Poroshell 120 SB + EC C18 3.0 x 50mm 2.7 µm

Flow 1.5 ml, 175 bar SB, 195 bar EC, 80°C, 254 nm (80 Hz), Inj. 0.5 µl

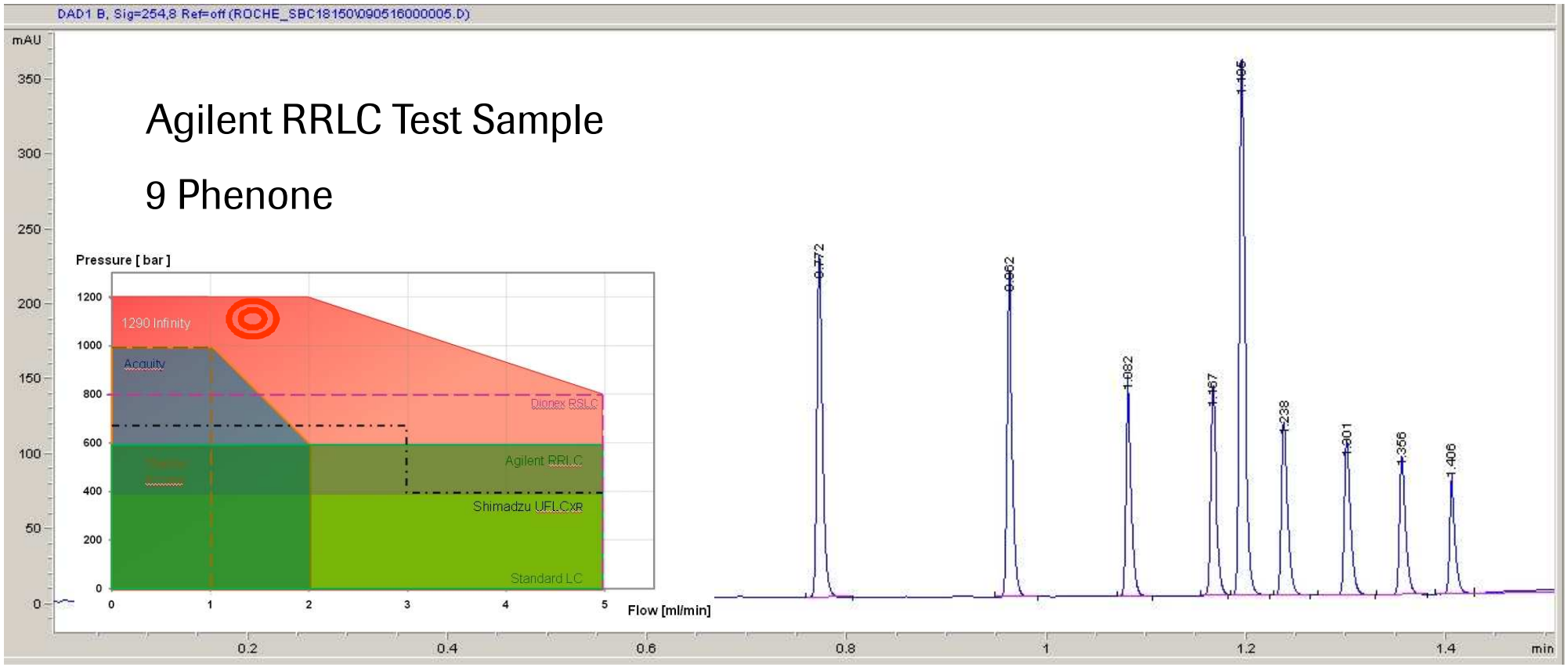
Gradient: Water (0.05% Formic acid) / 2-98 % Acetonitrile



Agilent Zorbax SB C18 2.1 x 150mm 1.8 µm

Flow 1.5 ml, 1065 bar, 80°C, 254 nm (80 Hz), Inj. 0.5 µl

Gradient: Water (0.05% Formic acid) / 2-98 % Acetonitrile



Agilent 1290 Infinity LC Beta Test

Column test

Summary

Agilent 1290 Infinity LC Beta Test

Summary

Highlights

- Diode-Array Detector
  - Flow cell technology
  - No Baselinedrifting with fast Gradient
- Binary pump
  - Strong, quiet, rubust pumps with newest technology inside
  - Fast and short Gradient at high flowrate and high pressure

Personal view

- Easy method transfer from HPLC, new results in seconds !!

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