

Using Method Translation to Increase Throughput while Maintaining the Same Elution Profile

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EZGC® Method Translator

Carrier Gas	Original	Translation
Flow	10.00 mL/min	10.00 mL/min
Pressure	0.25 MPa	0.25 MPa
Temperature	250.00 °C	250.00 °C

EZGC® Flow Calculator

Carrier Gas	Flow
Flow	10.00 mL/min
Pressure	0.25 MPa
Temperature	250.00 °C

EZGC® Chromatogram Modeler

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New! **EZGC®** Method Translator
and Flow Calculator



EZGC® Chromatogram Modeler

Translation from 30 m x 0.25 mm x 0.25 μm to 20 m x 0.15 mm x 0.15 μm

EZGC® Method Translator

Carrier Gas	Original	Translation
	Helium	Helium

Column

Length	30.00	20.00 m
Inner Diameter	0.25	0.15 mm
Film Thickness	0.25	0.15 μm
Phase Ratio	250	250

Control Parameters

Column Flow	1.20	0.72 mL/min
Average Velocity	40.13	38.07 cm/sec
Holdup Time	1.25	0.88 min
Inlet Pressure	11.43 psi	31.20 psi
Outlet Pressure (abs)	0.00	0.00 psi

Atm Vacuum Atm Vacuum

Oven Program

☐ Isothermal
☒ Ramps

Ramp Rate (°C/min)	Temp (°C)	Hold Time (min)	Ramp Rate (°C/min)	Temp (°C)	Hold Time (min)
	70	1		70	0.7
28	285	0	39.8	285	0
3	305	0	4.3	305	0
20	330	1	28.5	330	0.7

Number of Ramps (1-4): 3

Control Method

Constant Flow

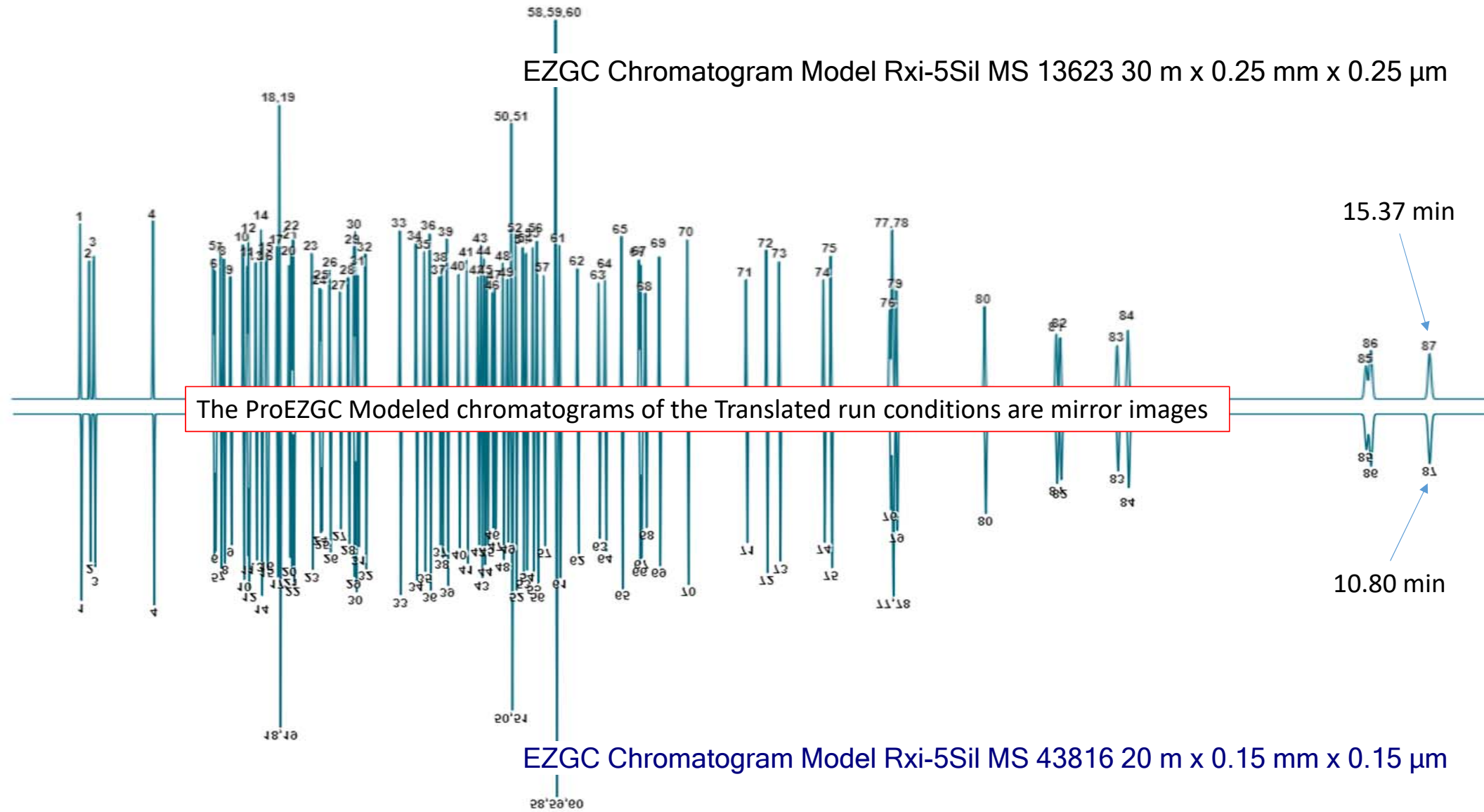
Results

Solve for ☐ Efficiency ☐ Speed ☒ Translate ☐ Custom

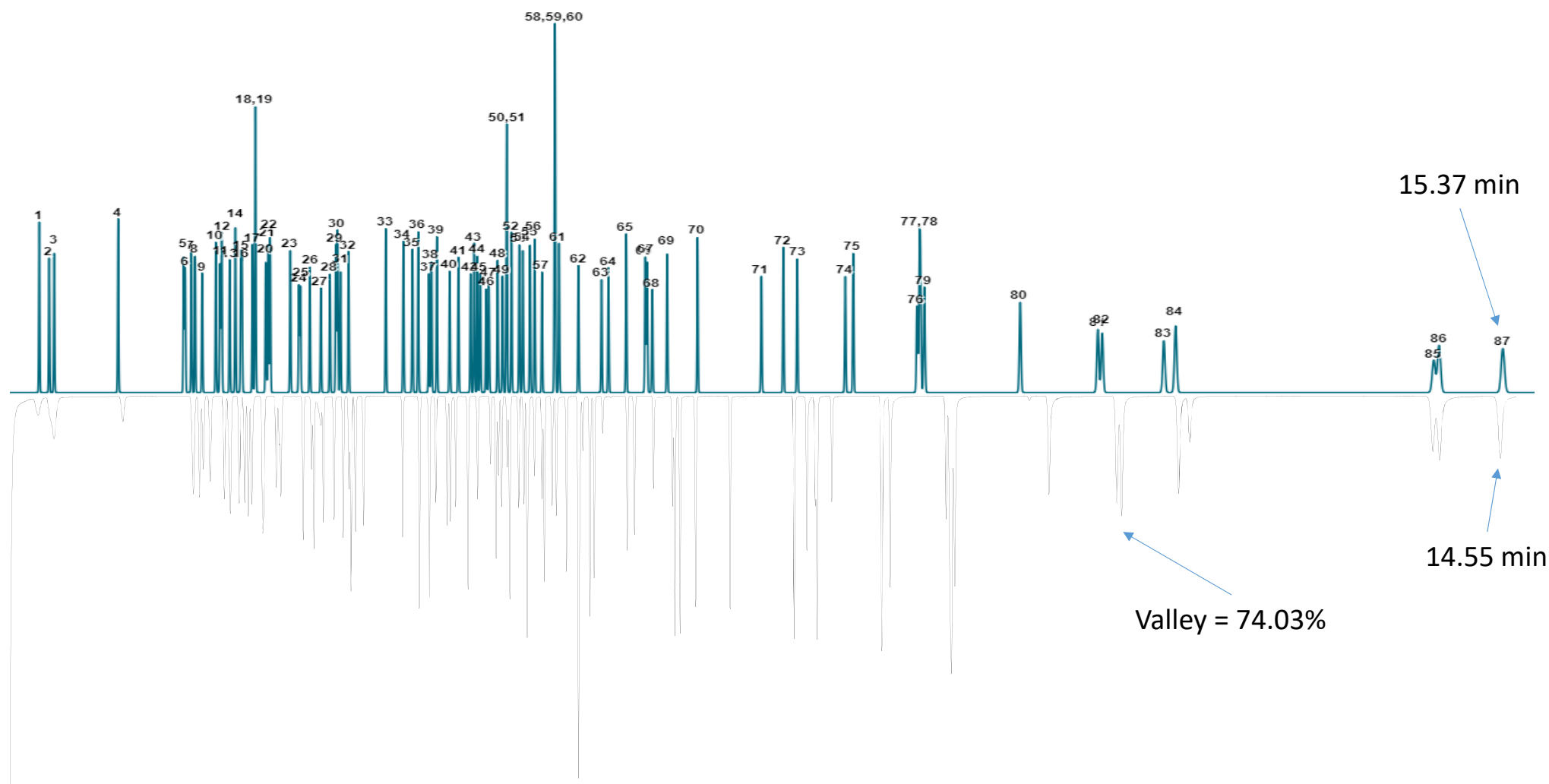
Run Time	17.60	12.33 min
Speed		1.43 x

Use Flow Calculator Values

EZGC Chromatogram Model Rxi-5Sil MS 13623 30 m x 0.25 mm x 0.25 μ m

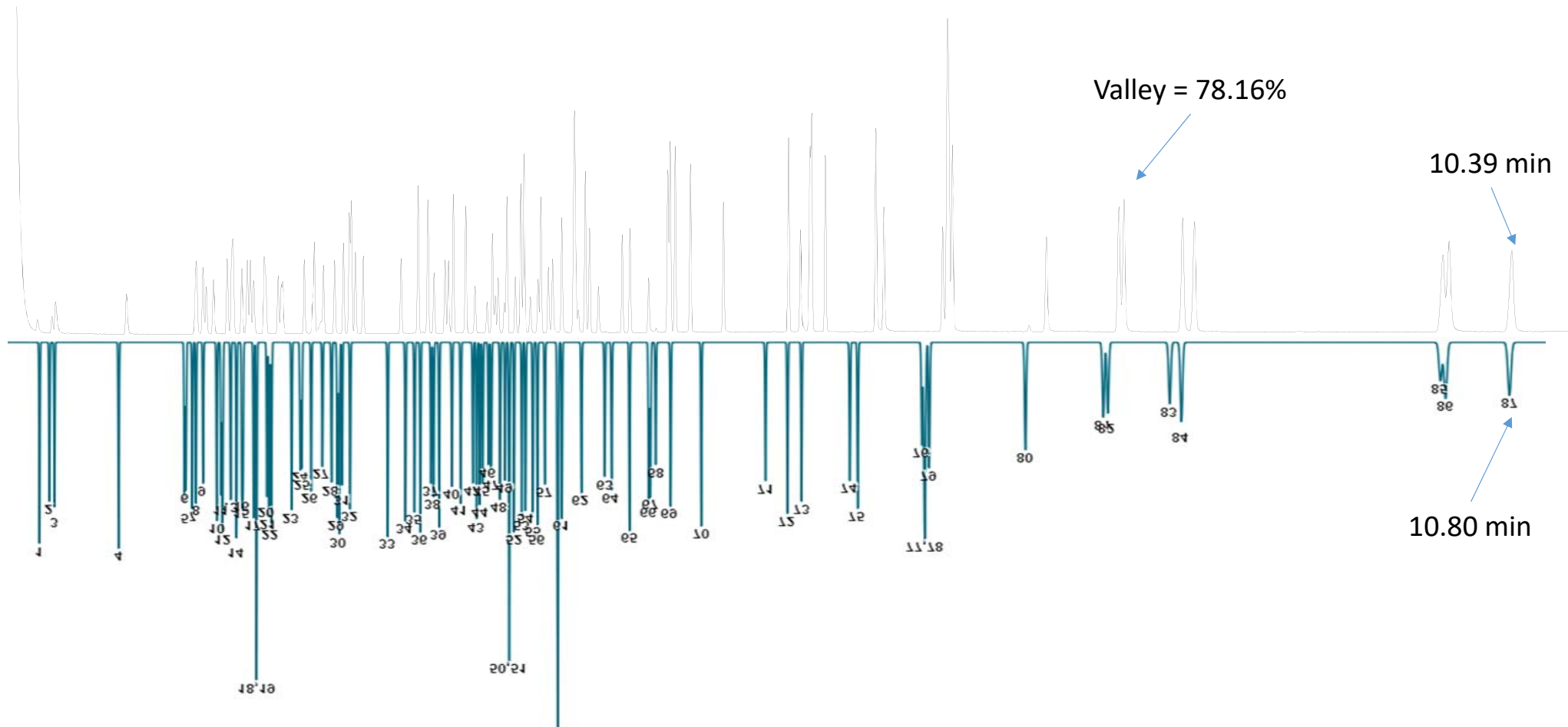


EPA Method 8270 EZGC Chromatogram Model Rxi-5Sil MS 13623 30 m x 0.25 mm x 0.25 μ m



GC_EV1248 - Rxi-5Sil MS 13623 30 m x 0.25 mm x 0.25 μ m 4 ng on column

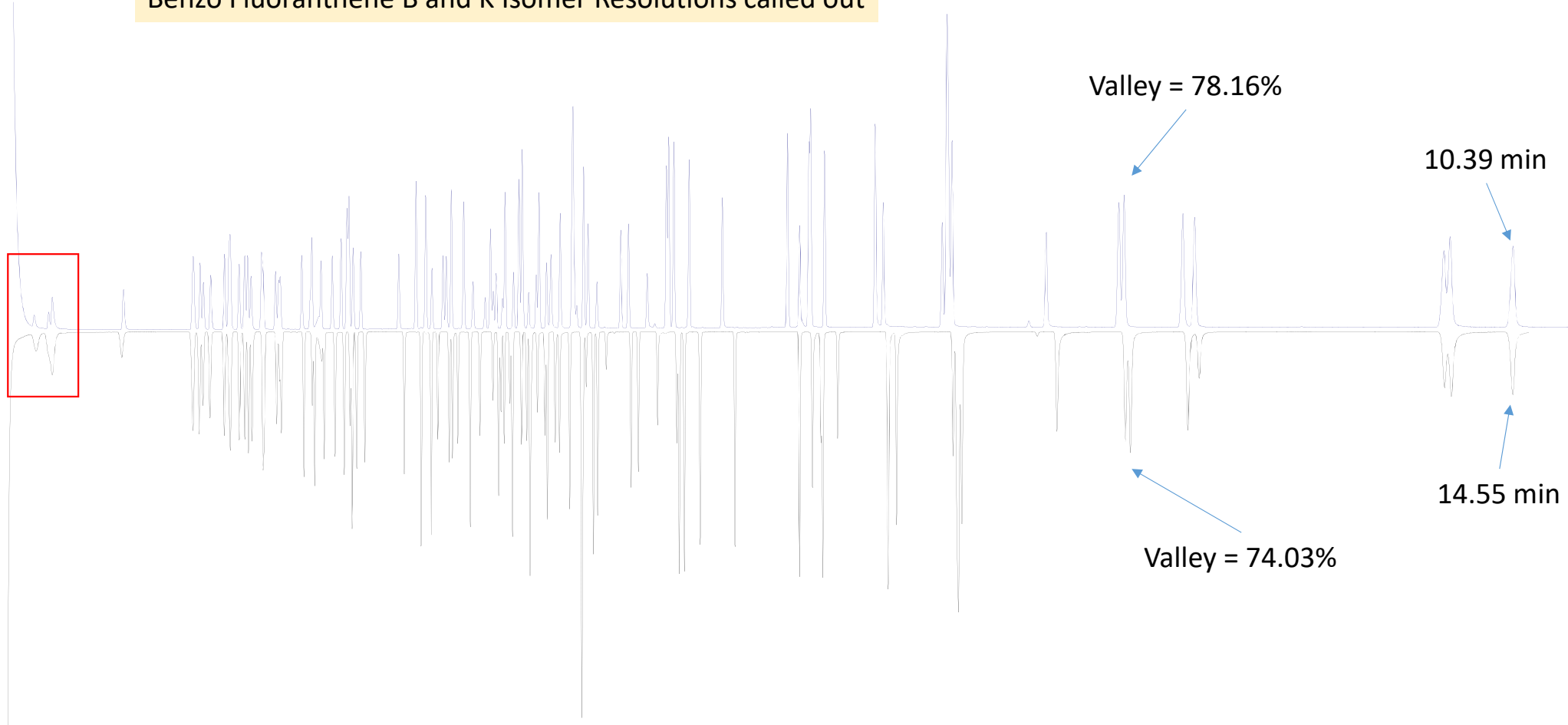
GC_EV1471 - Rxi-5Sil MS 43816 20 m x 0.15 mm x 0.15 μ m 1 ng on column



EZGC Chromatogram Model Rxi-5Sil MS 43816 20 m x 0.15 mm x 0.15 μ m

GC_EV1471 - Rxi-5Sil MS 43816 20 m x 0.15 mm x 0.15 μ m 1 ng on column

Benzo Fluoranthene B and K Isomer Resolutions called out



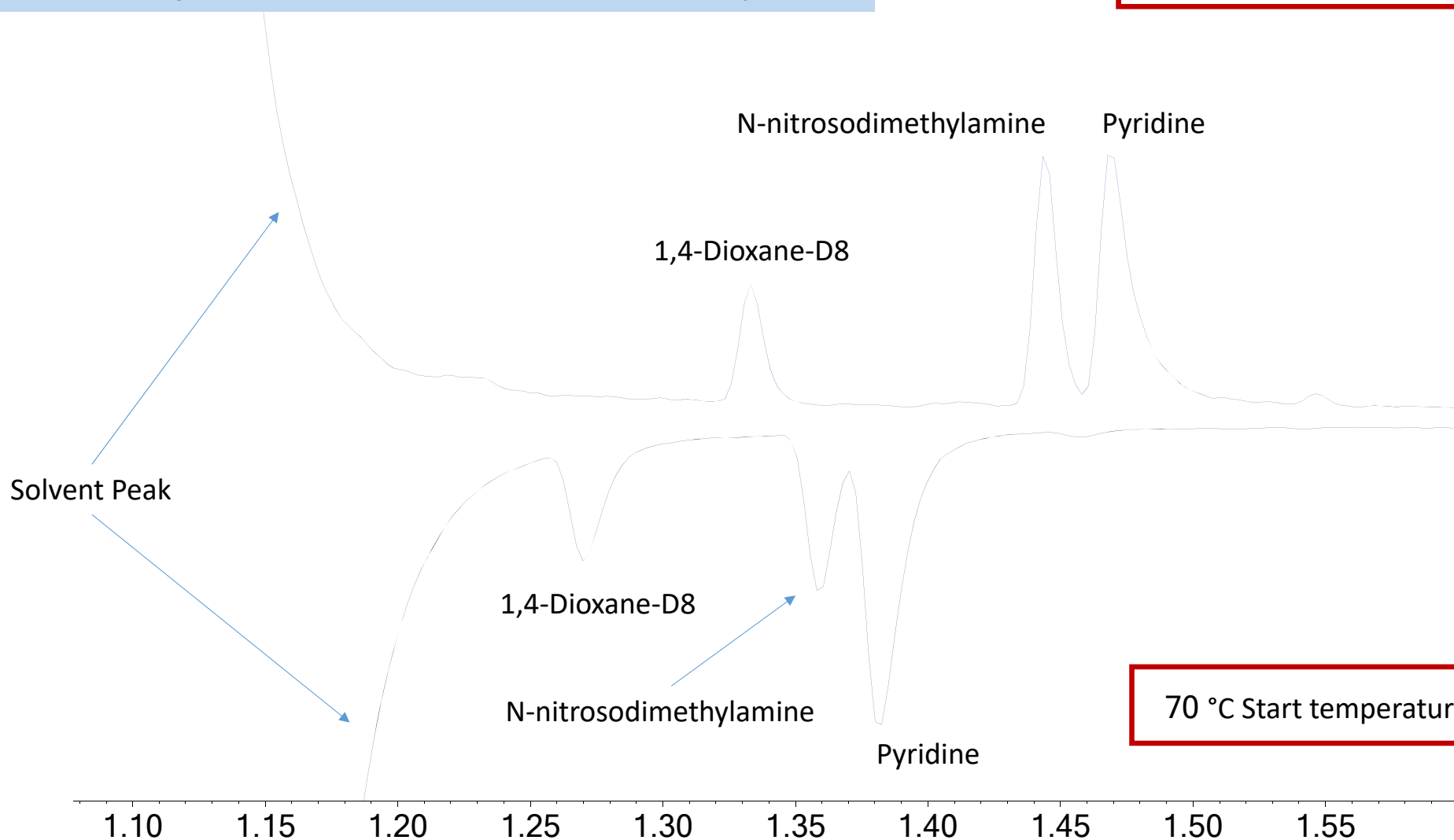
GC_EV1248 - Rxi-5Sil MS 13623 30 m x 0.25 mm x 0.25 μ m 4 ng on column

Key Considerations for migrating to a 20 m x 0.15 mm x 0.15 μ m column

- Use split injection. The narrow-bore columns overload at low mass on column
- Inlet flow during a splitless injection is slow, and solvent focusing requires a lower starting oven temperature, reducing cycle-time gains
- Pairing a 20:1 split and the Extractor Source allows you to minimize other changes to the analytical method
 - Use the same injection volume (1 μ L)
 - Similar performance (LOQ) to a 10:1 split on a 30 m x 0.25 mm ID column
 - You can increase injection volume while keeping 20:1 split and maintain linearity
 - Same Liner (4 mm ID instead of 2 mm ID)
 - Same Calibration Standard Concentrations

Method Adjustments are sometimes required

60 °C start temperature



70 °C Start temperature

60 °C start temperature

Aniline

Bis(2-chloroethyl)ether

Valley = 90.56%

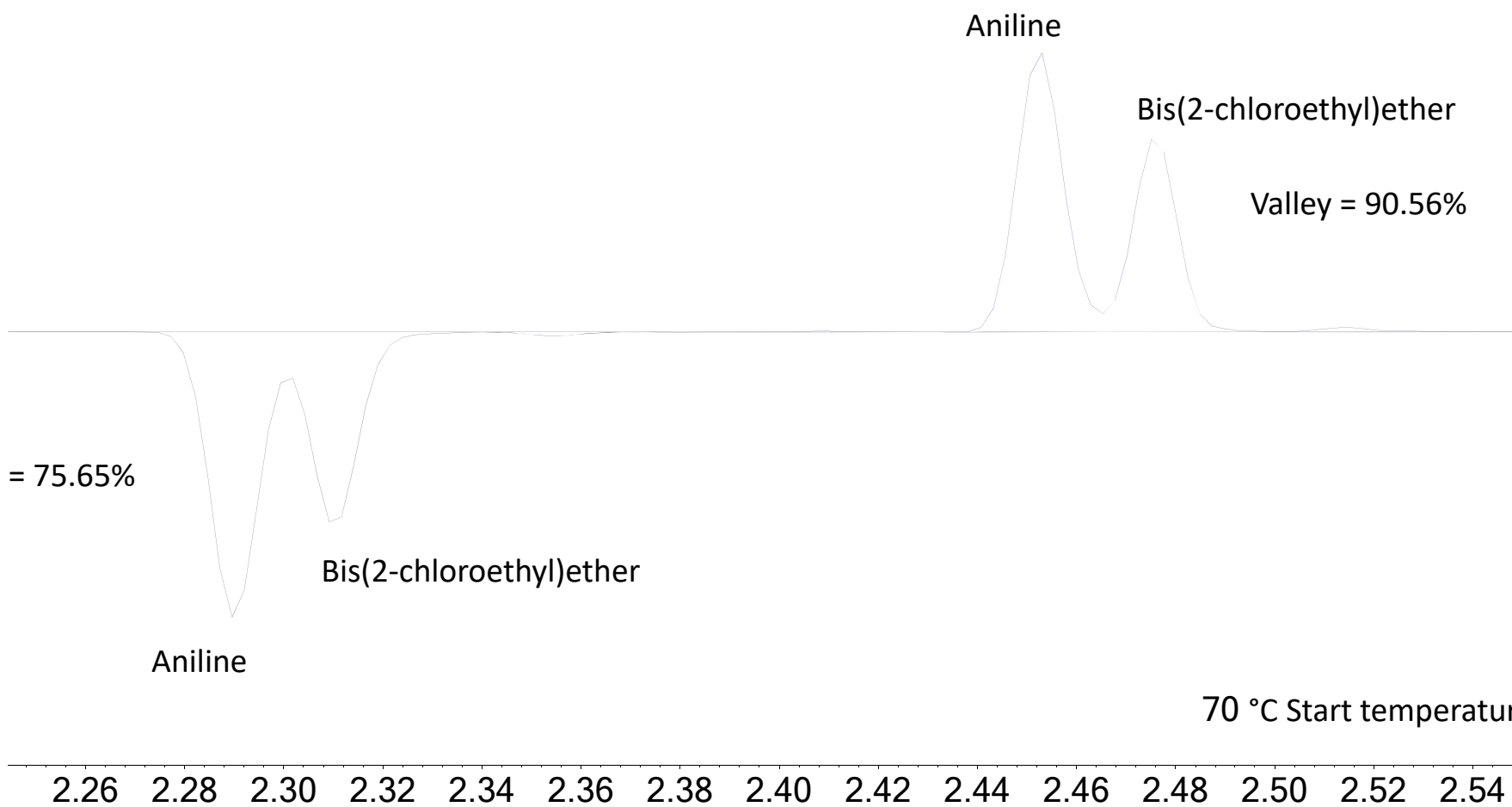
Valley = 75.65%

Bis(2-chloroethyl)ether

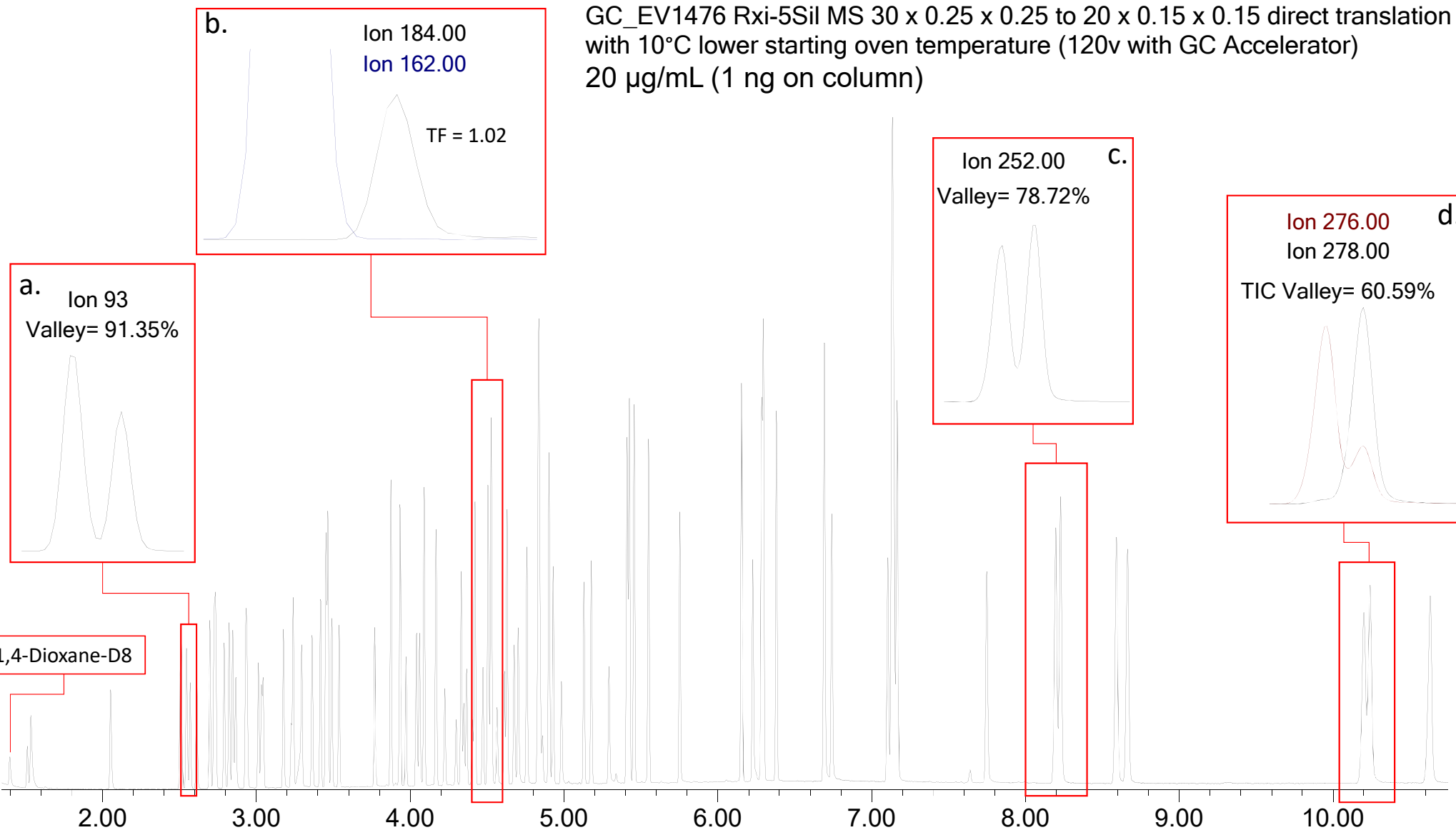
Aniline

70 °C Start temperature

2.26 2.28 2.30 2.32 2.34 2.36 2.38 2.40 2.42 2.44 2.46 2.48 2.50 2.52 2.54



GC_EV1476 Rxi-5Sil MS 30 x 0.25 x 0.25 to 20 x 0.15 x 0.15 direct translation
with 10°C lower starting oven temperature (120v with GC Accelerator)
20 µg/mL (1 ng on column)



Why use a 20 m x 0.15 mm ID instead of a 20 m x 0.18 mm ID when the 0.18 mm ID column yields a faster run?

	ID (mm)	df (μm)	Beta	Length (m)	min plates/m	min total plates
13623	0.25	0.25	250	30	3900	117000
43602	0.18	0.18	250	20	5000	100000
43816	0.15	0.15	250	20	5500	110000

Translation from 30 m x 0.25 mm x 0.25 μm
to 20 m x 0.18 mm x 0.18 μm

EZGC® Method Translator

Carrier Gas	Original	Translation
	Helium	Helium

Column

	Original	Translation	
Length	30.00	20.00	m
Inner Diameter	0.25	0.18	mm
Film Thickness	0.25	0.18	μm
Phase Ratio	250	250	

Control Parameters

	Original	Translation	
Column Flow	1.20	0.86	mL/min
Average Velocity	40.13	41.71	cm/sec
Holdup Time	1.25	0.80	min
Inlet Pressure	11.43	20.22	psi
Outlet Pressure (abs)	0.00	0.00	psi

Atm Vacuum Atm Vacuum

Oven Program

☐ Isothermal
☒ Ramps

Number of Ramps (1-4): **3**

Ramp Rate (°C/min)	Temp (°C)	Hold Time (min)	Ramp Rate (°C/min)	Temp (°C)	Hold Time (min)
	60	1		60	0.65
28	285	0	43.6	285	0
3	305	0	4.7	305	0
20	330	1	31.2	330	0.65

Control Method

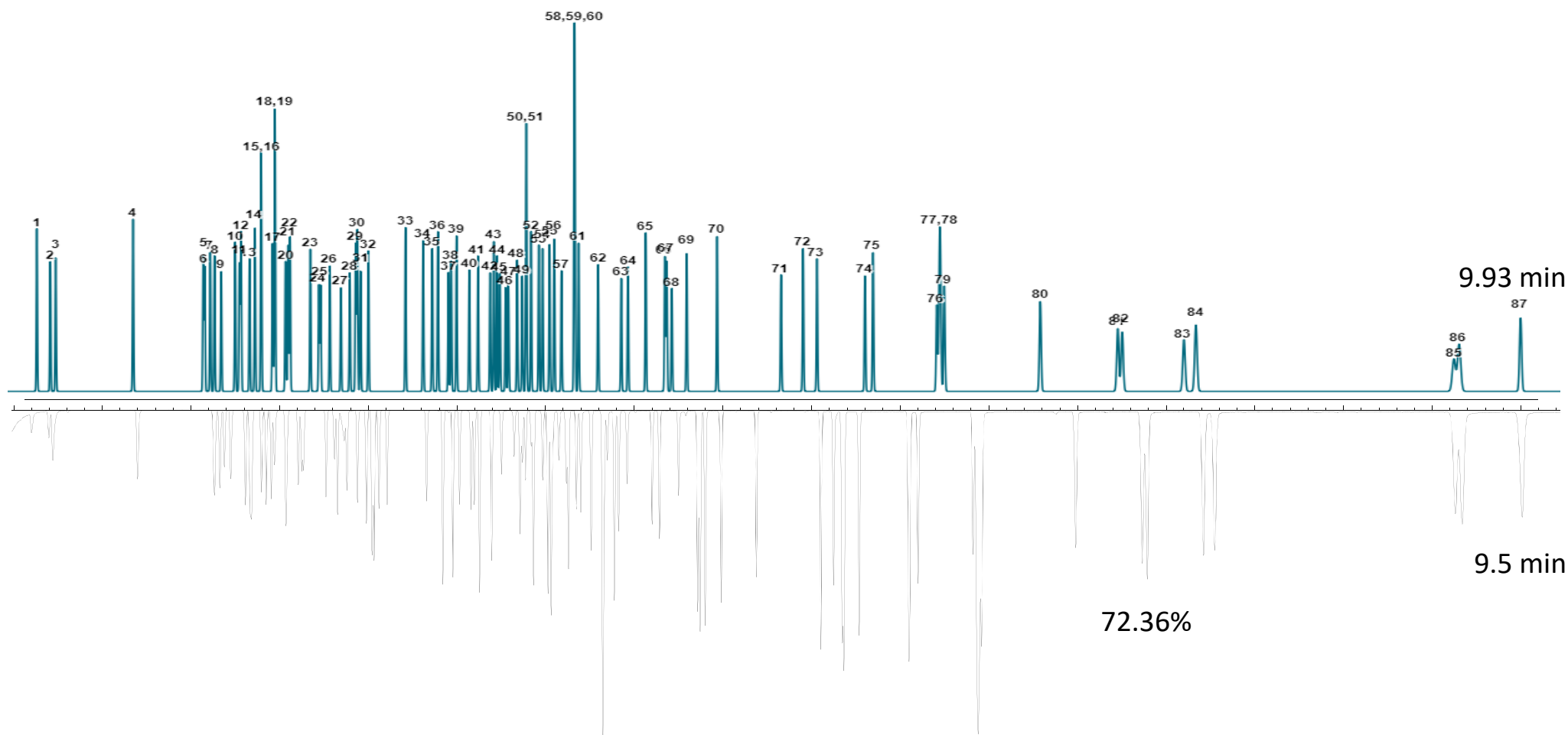
Constant Flow

Results

Solve for: ☐ Efficiency ☐ Speed ☒ Translate ☐ Custom

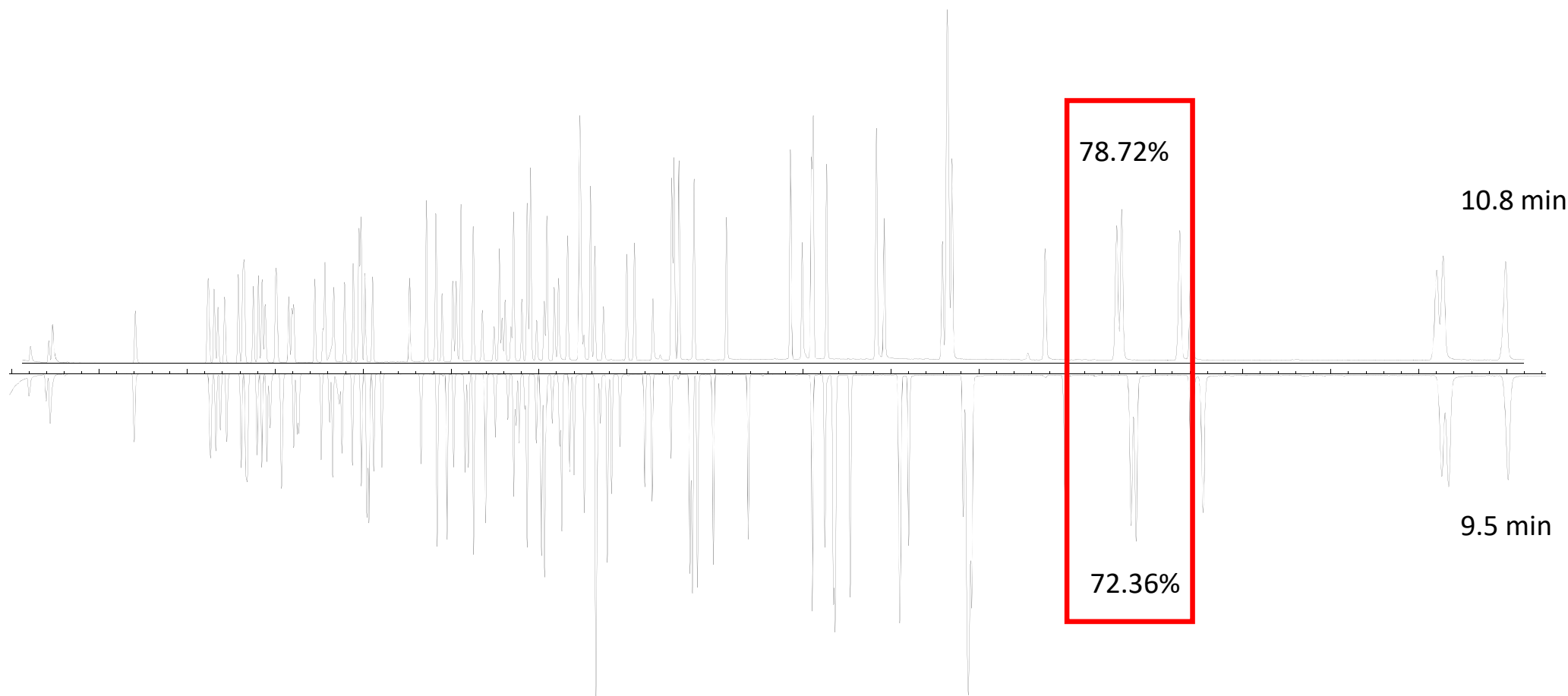
Run Time	17.95	11.52 min
Speed		1.56 x

EZGC Model of EPA Method 8270 on the Rxi-5Sil MS 20 m x 0.18 mm x 0.18 μ m



EPA Method 8270 on the Rxi-5Sil MS 20 m x 0.18 mm x 0.18 μ m

EPA Method 8270 on the Rxi-5Sil MS 20 m x 0.15 mm x 0.15 μm

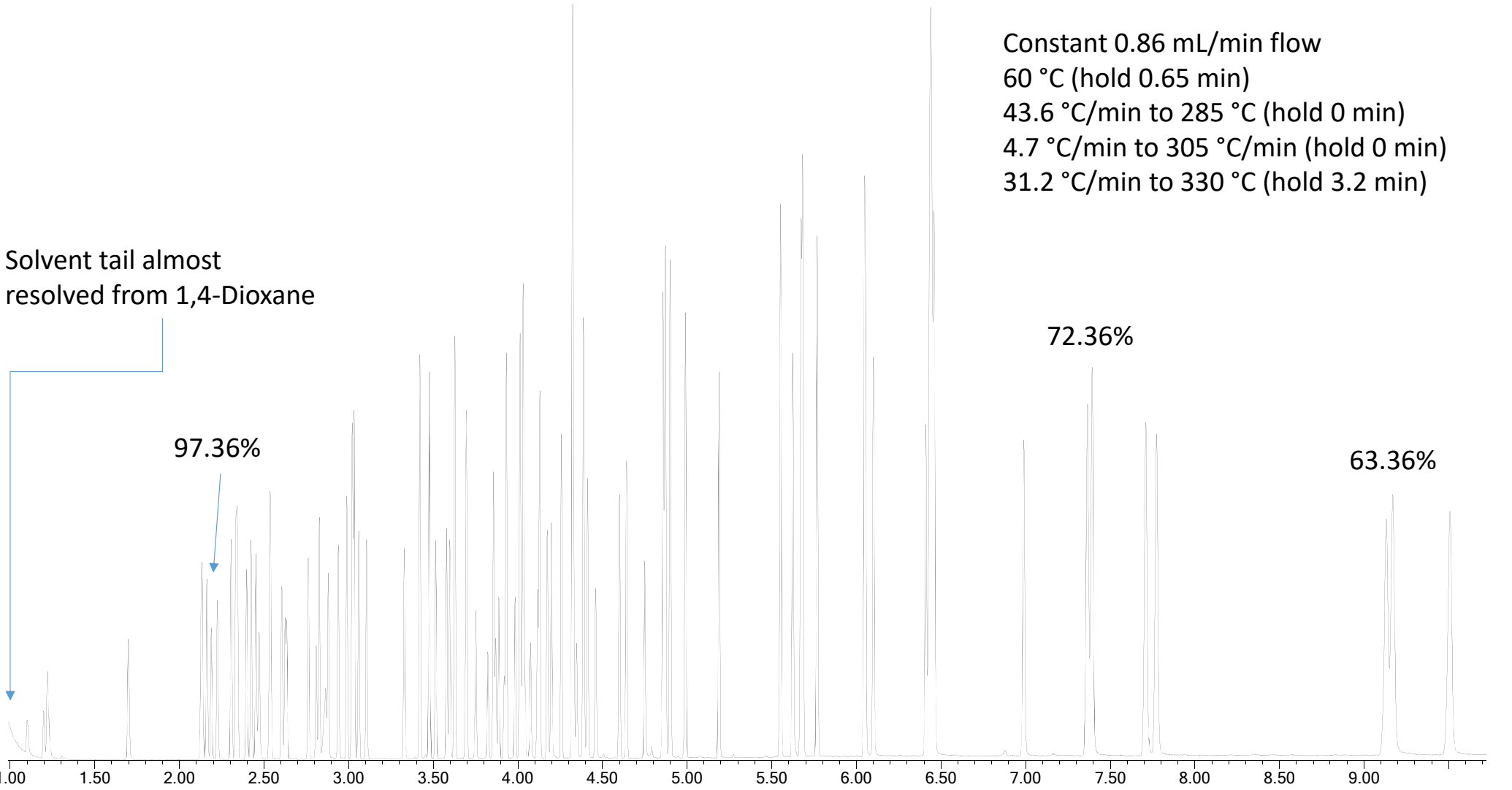


EPA Method 8270 on the Rxi-5Sil MS 20 m x 0.18 mm x 0.18 μm

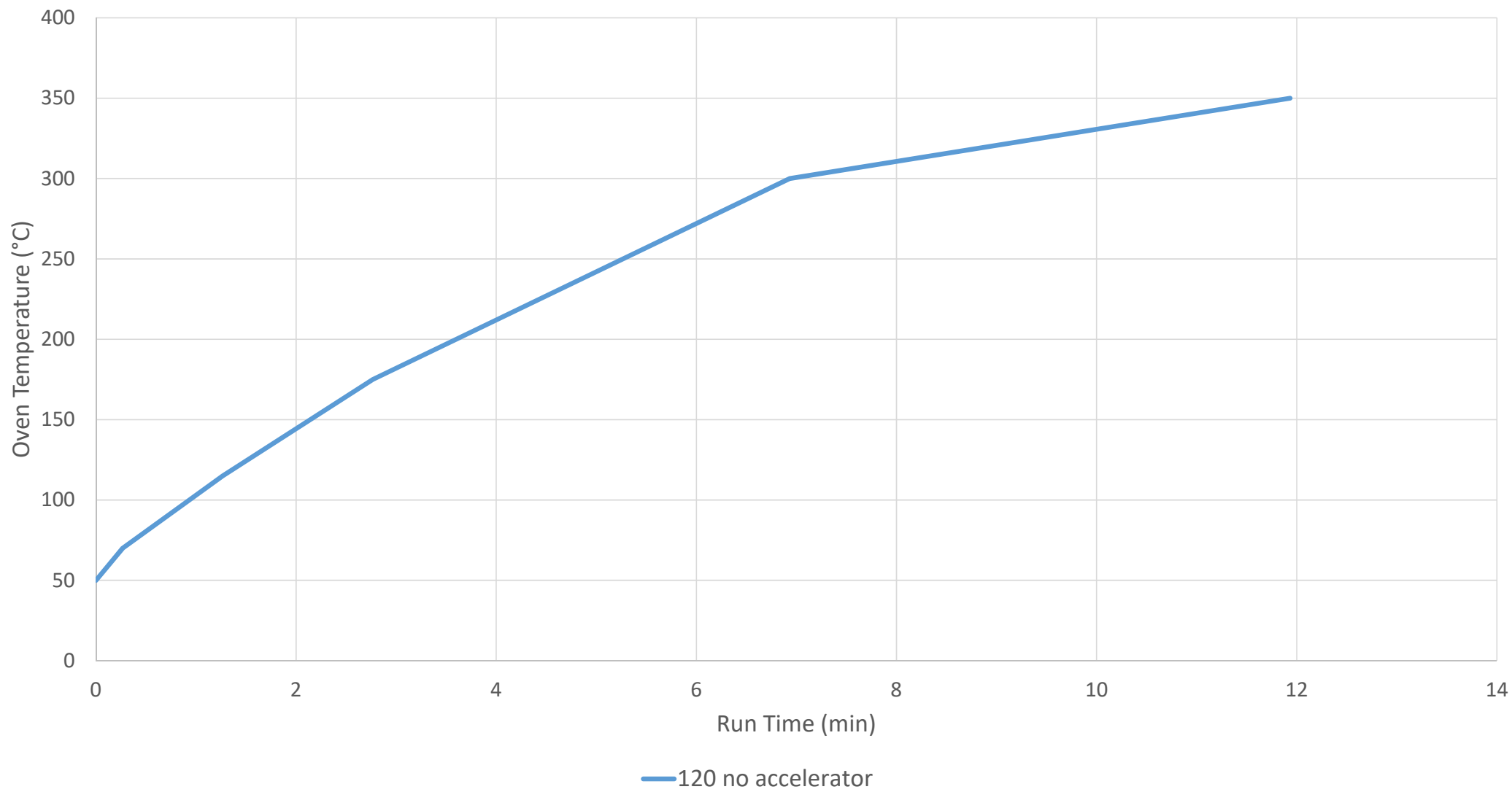
EPA 8270 on the Rxi-5Sil MS 20 m x 0.18 mm x 0.18 µm

Constant 0.86 mL/min flow
60 °C (hold 0.65 min)
43.6 °C/min to 285 °C (hold 0 min)
4.7 °C/min to 305 °C/min (hold 0 min)
31.2 °C/min to 330 °C (hold 3.2 min)

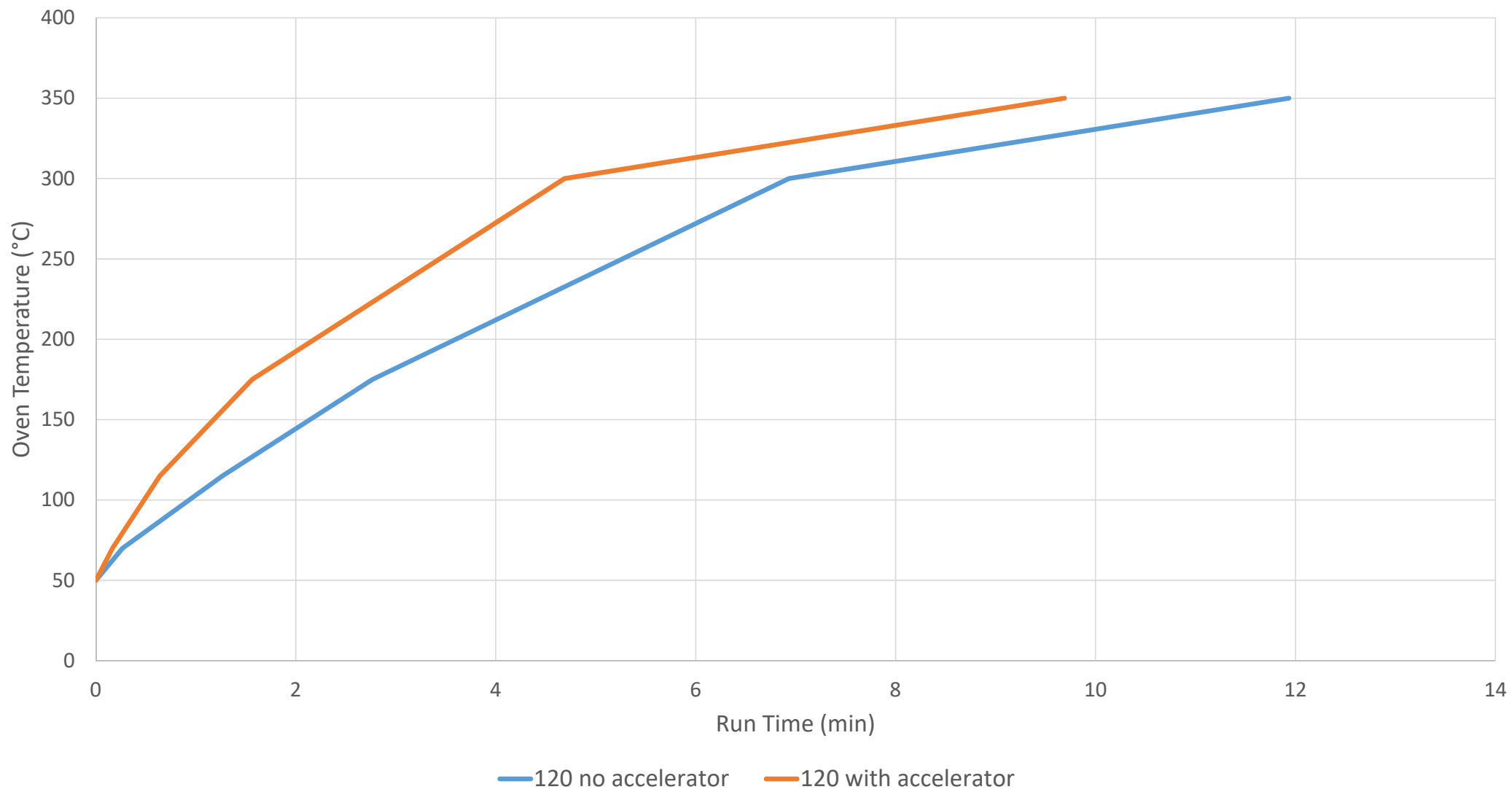
Solvent tail almost
resolved from 1,4-Dioxane



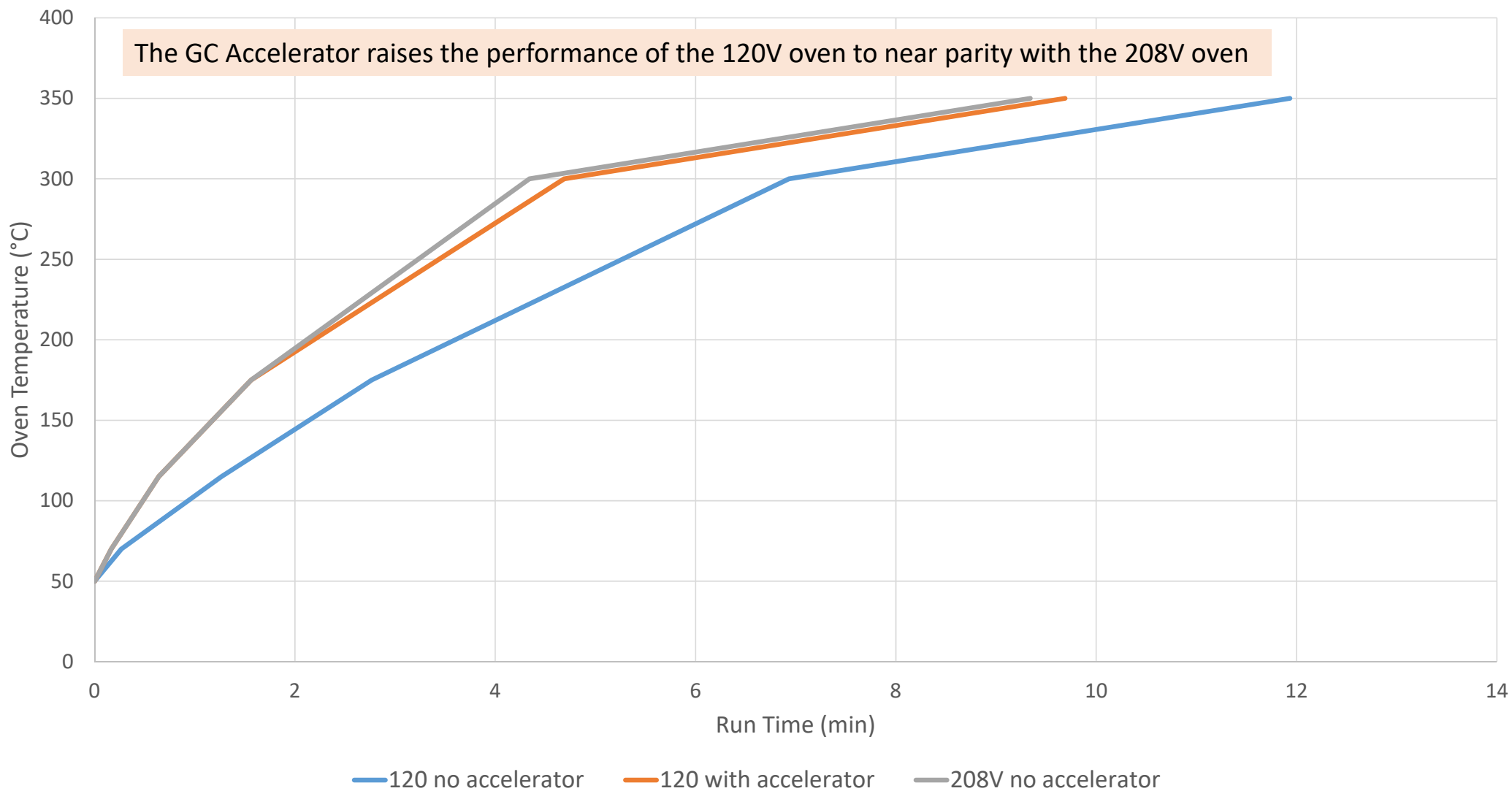
GC Oven Ramp Profiles with and without GC Accelerator



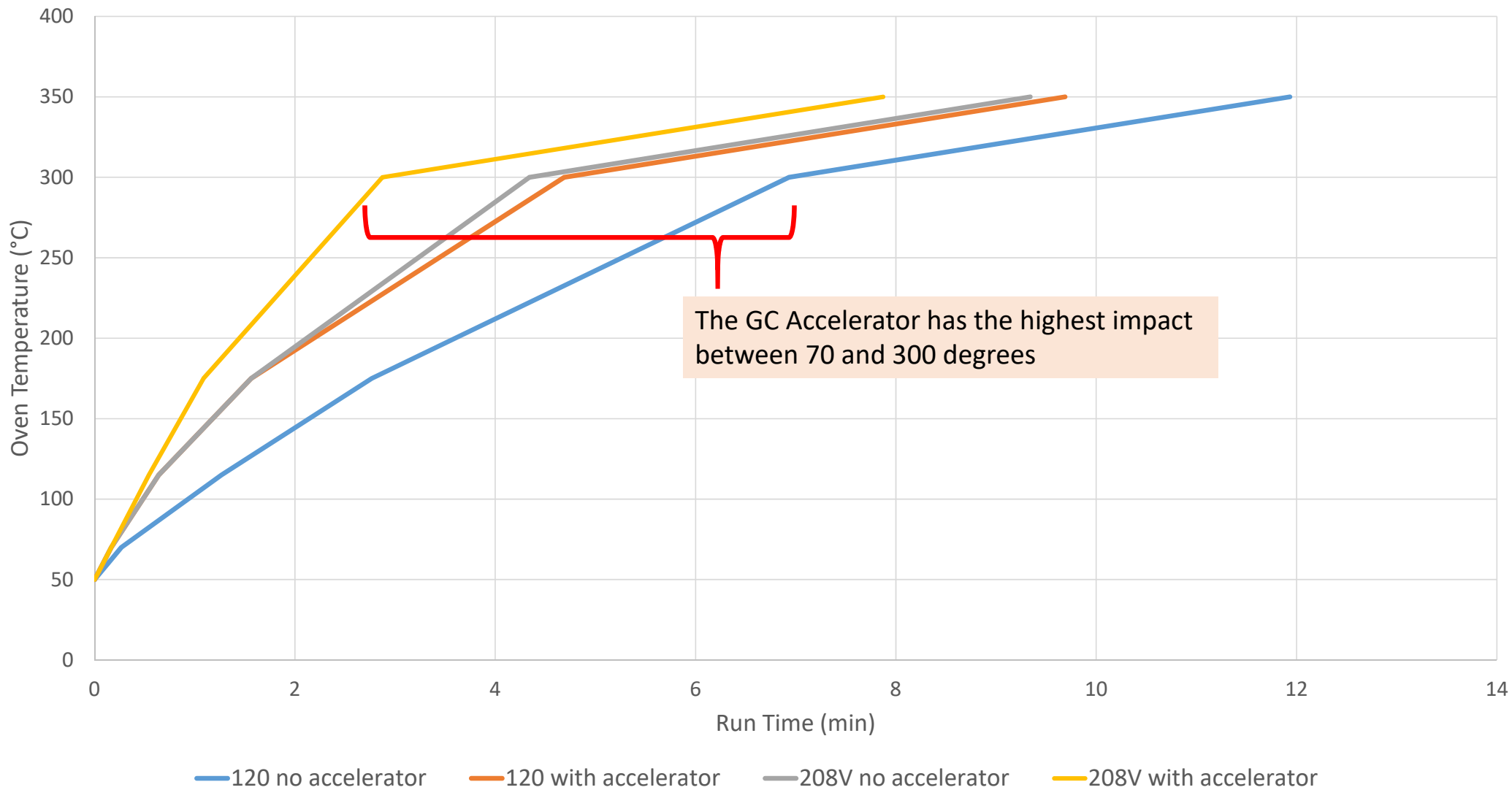
GC Oven Ramp Profiles with and without GC Accelerator



GC Oven Ramp Profiles with and without GC Accelerator

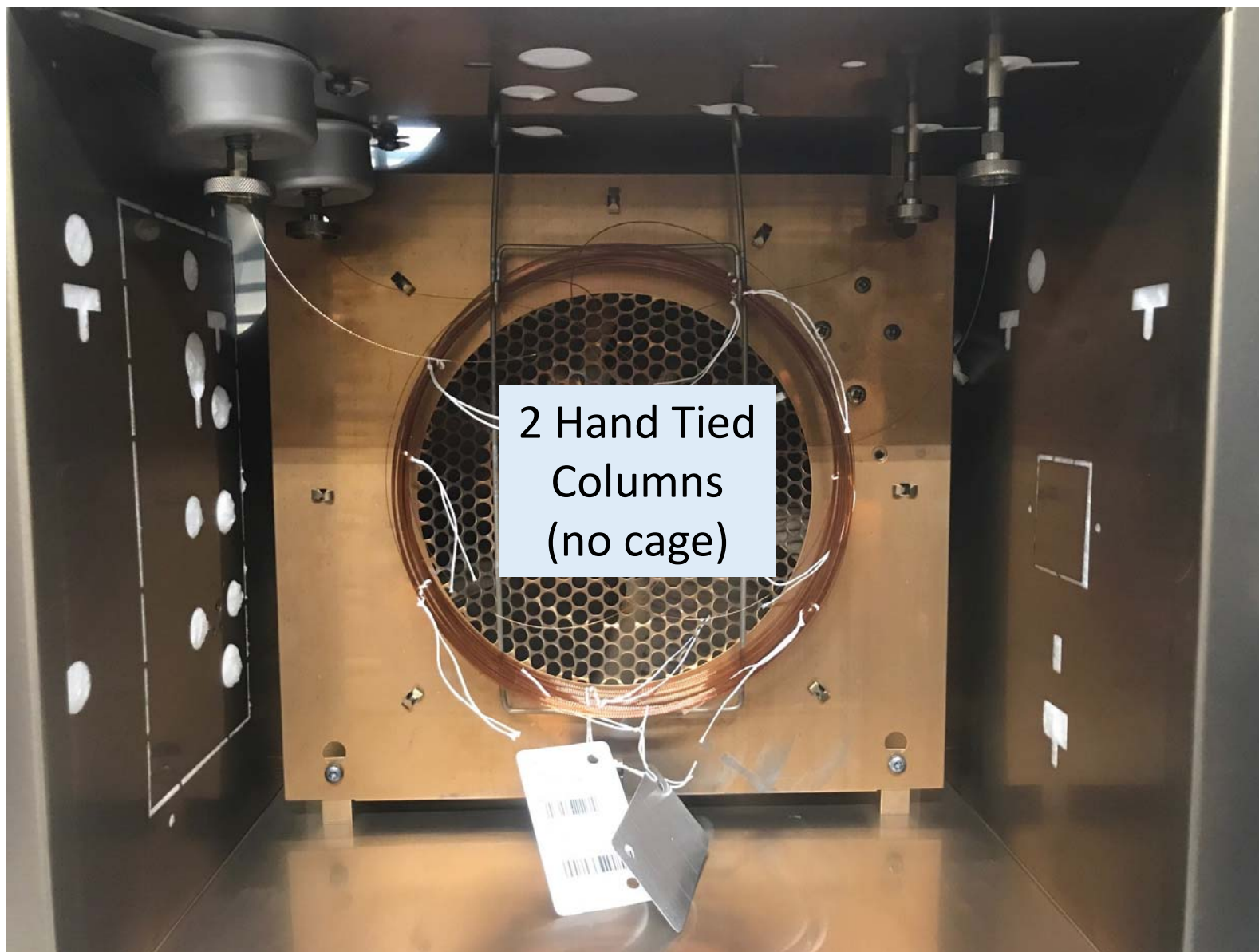


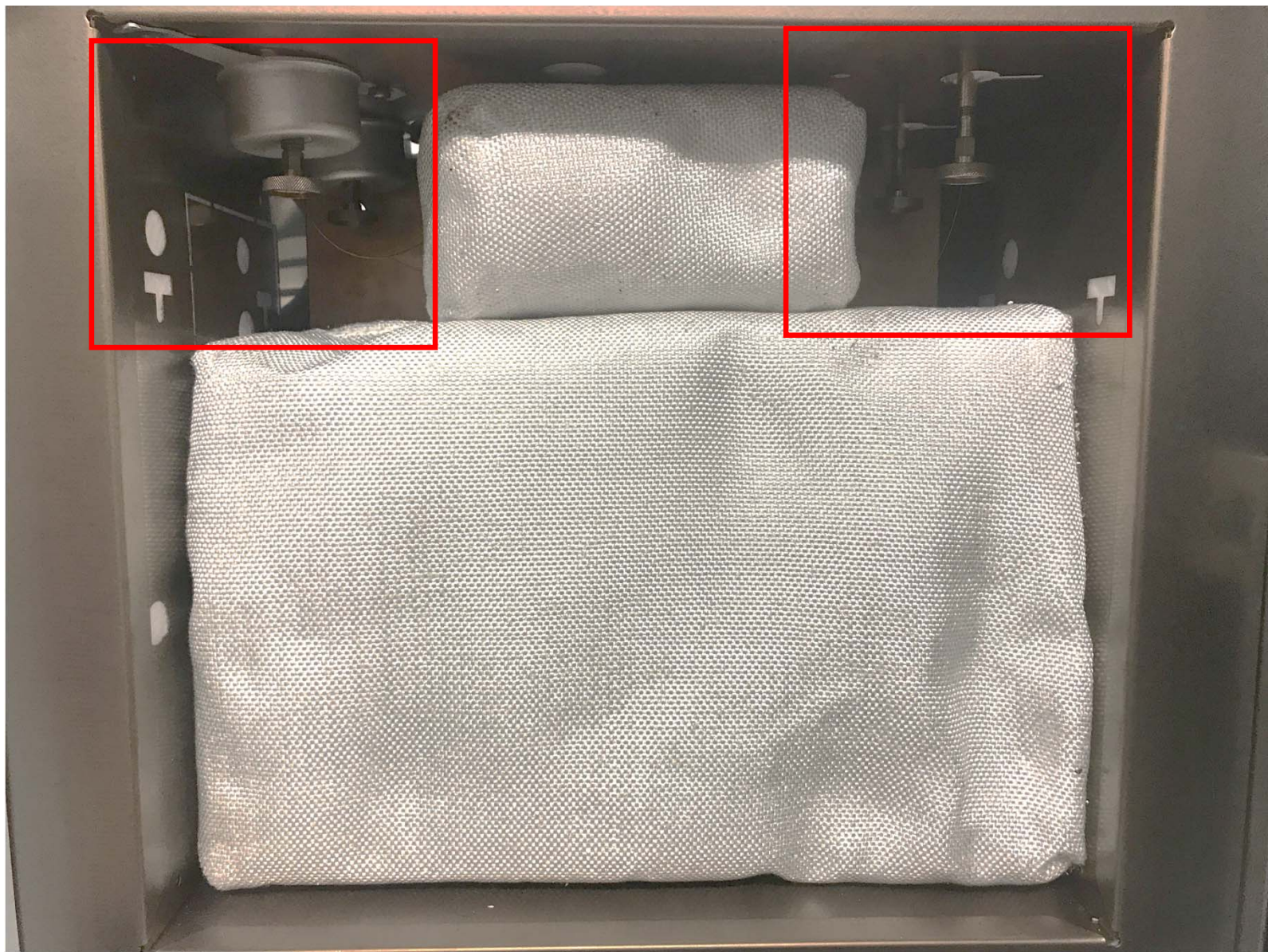
GC Oven Ramp Profiles with and without GC Accelerator



The GC Accelerator can also be used for dual channel GC analysis

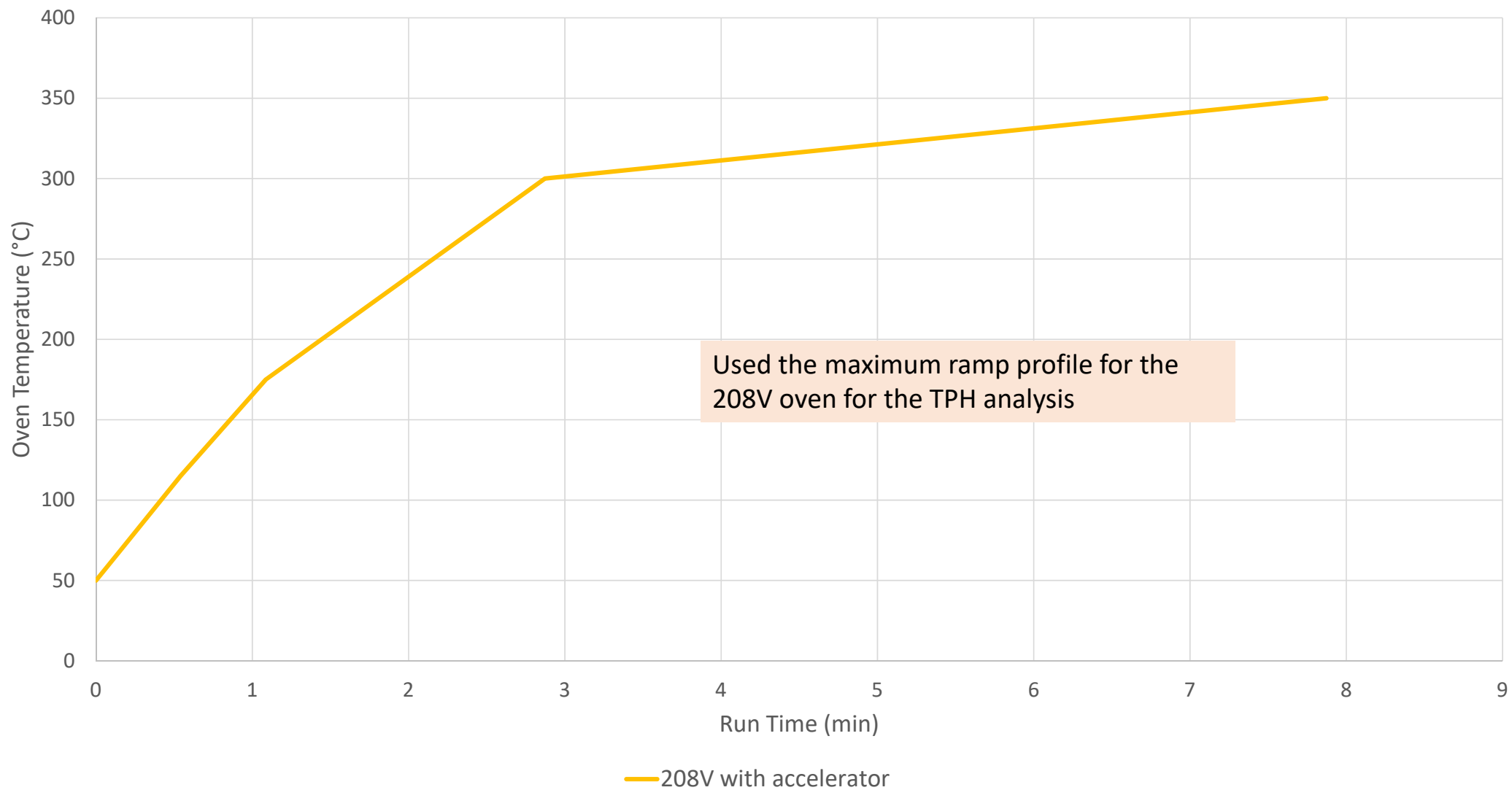
Example: Dual Channel GC-FID analysis of TPH

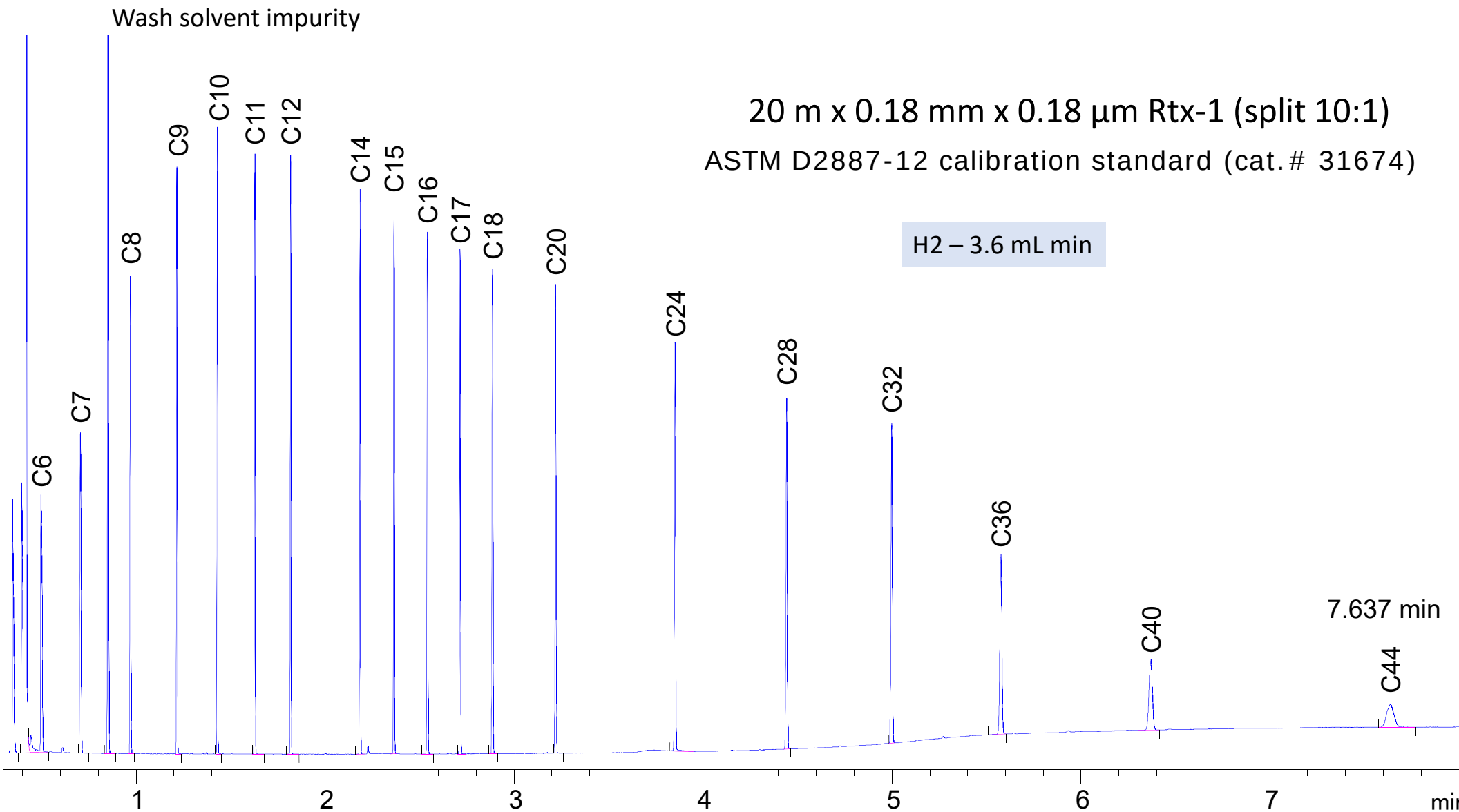






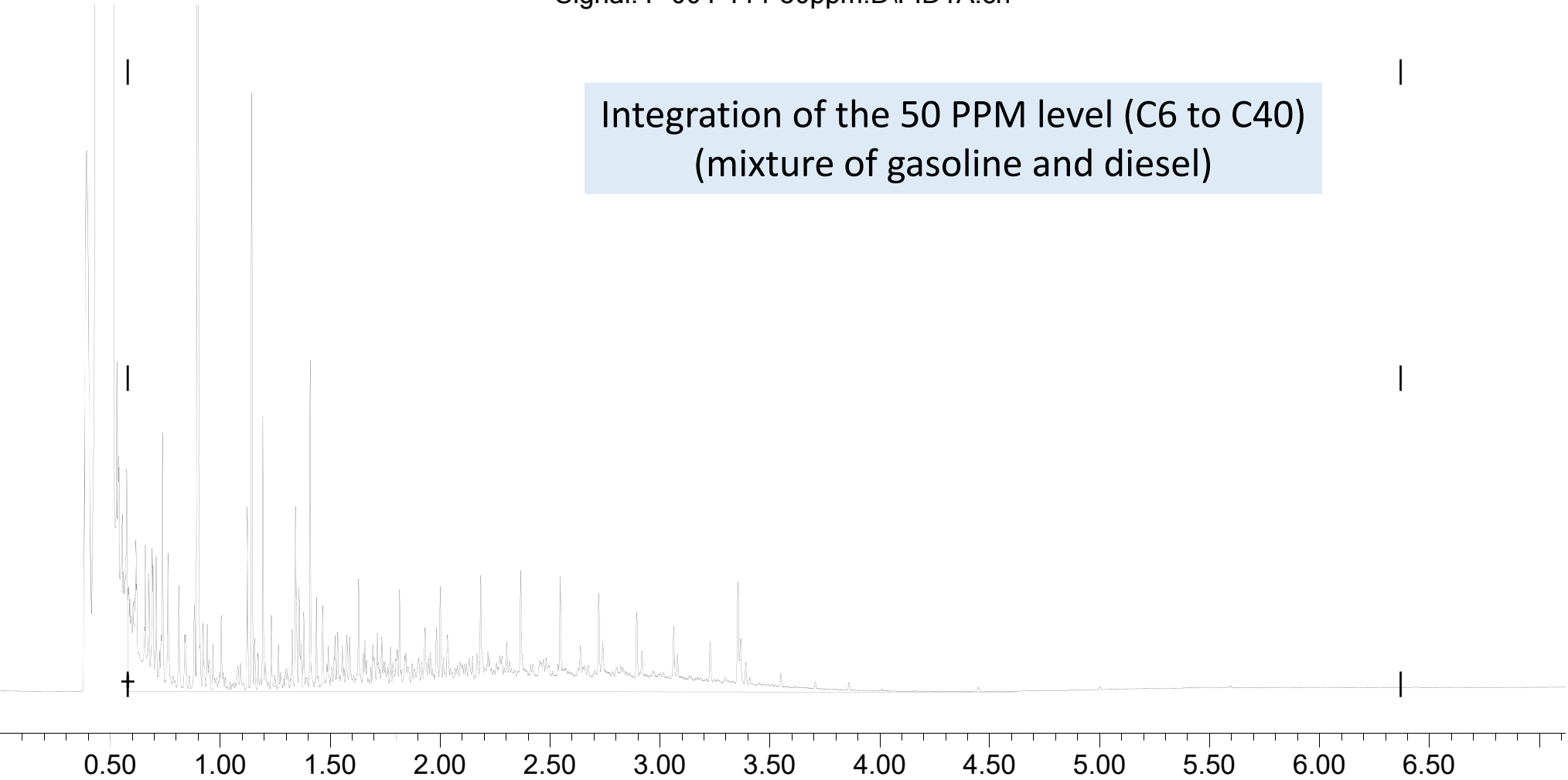
GC Oven Ramp Profiles with and without GC Accelerator





Signal: F-004-114-50ppm.D\FID1A.ch

Integration of the 50 PPM level (C6 to C40)
(mixture of gasoline and diesel)



GC Accelerator Kit – Questions?

