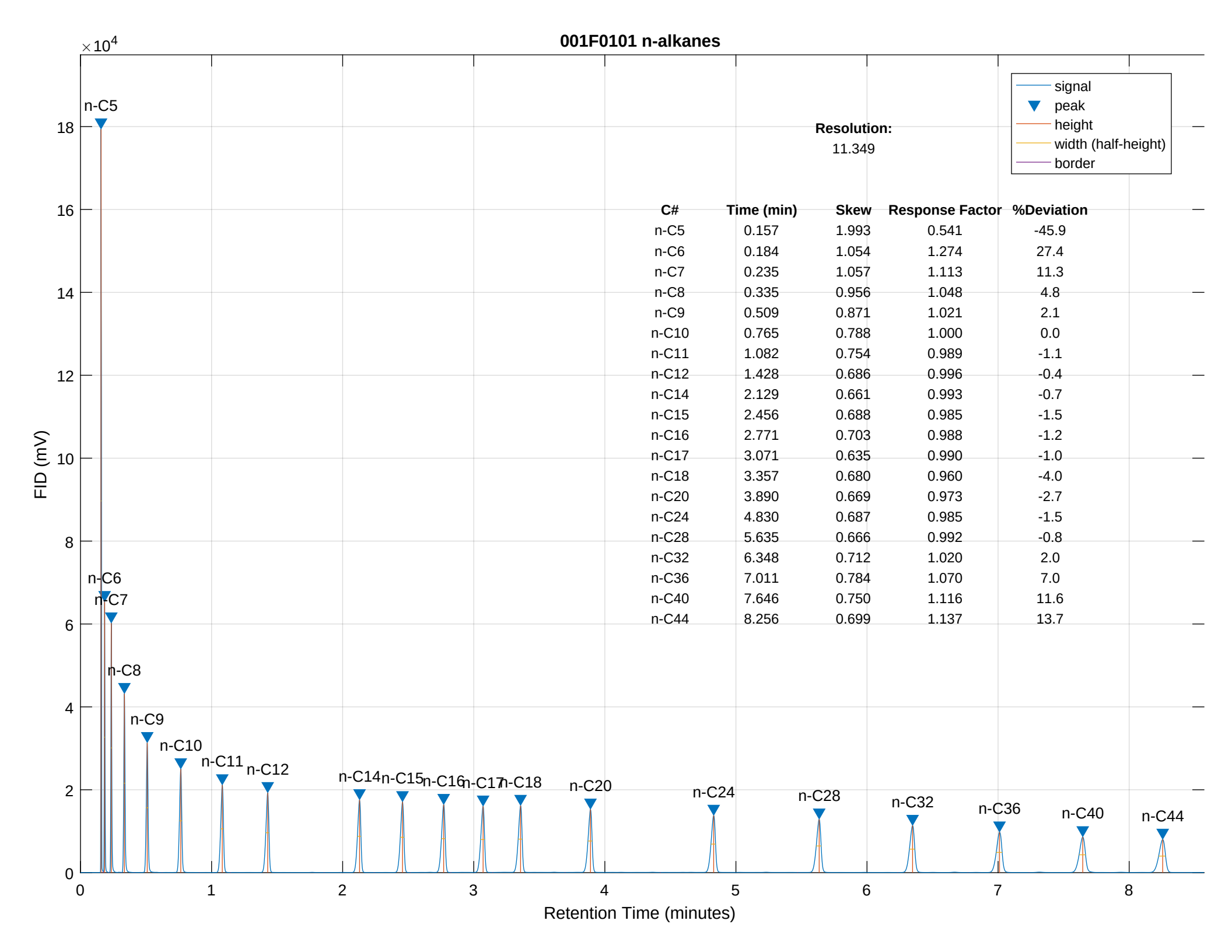
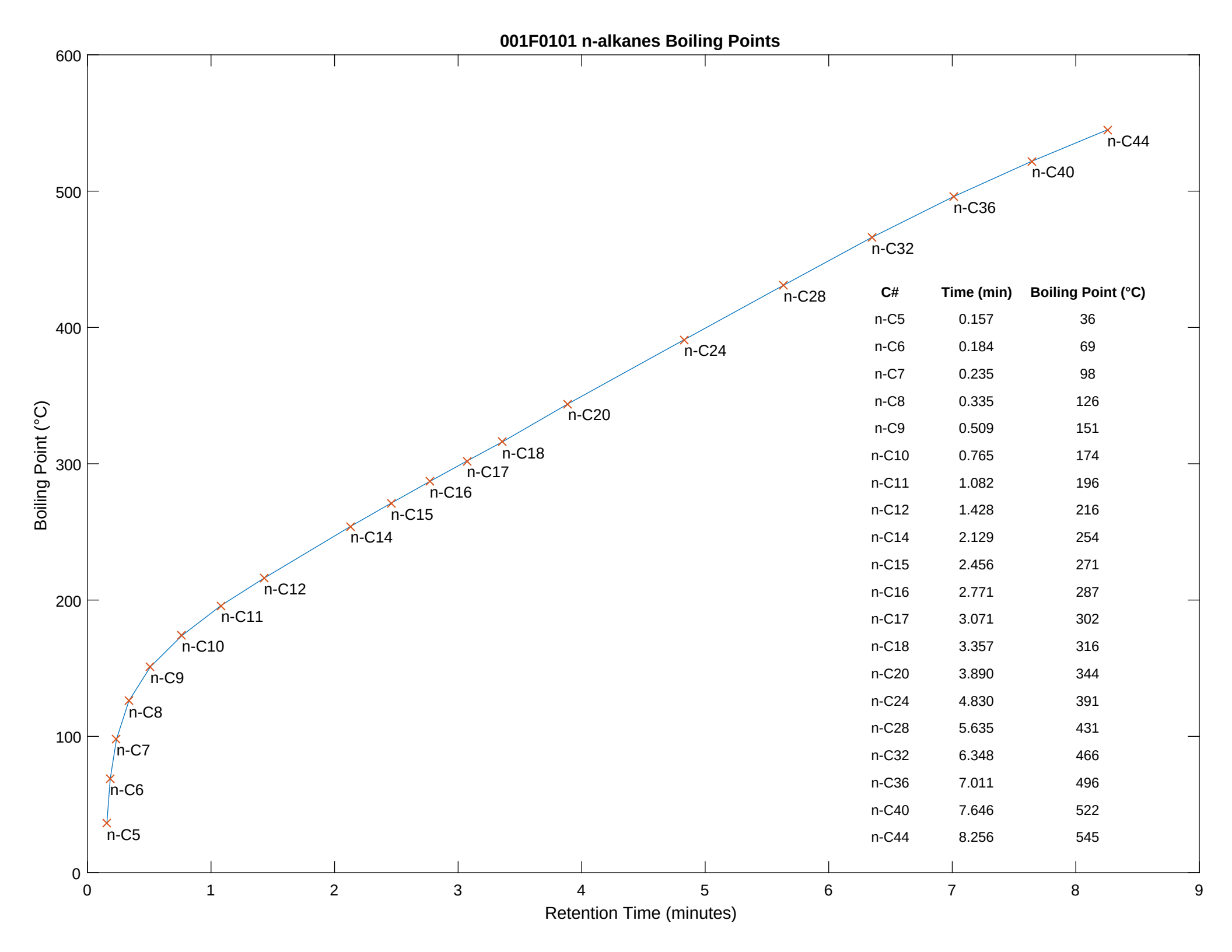
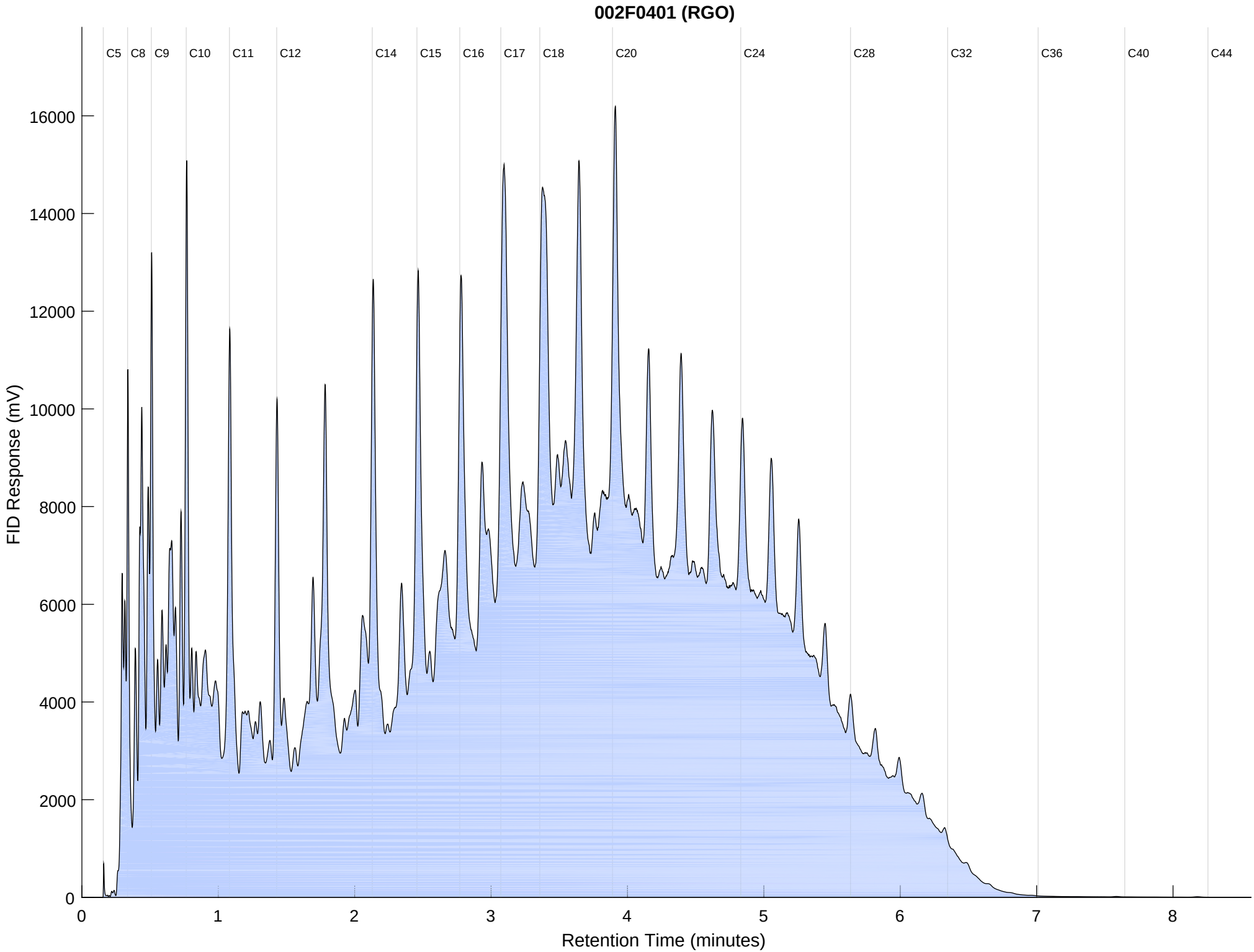
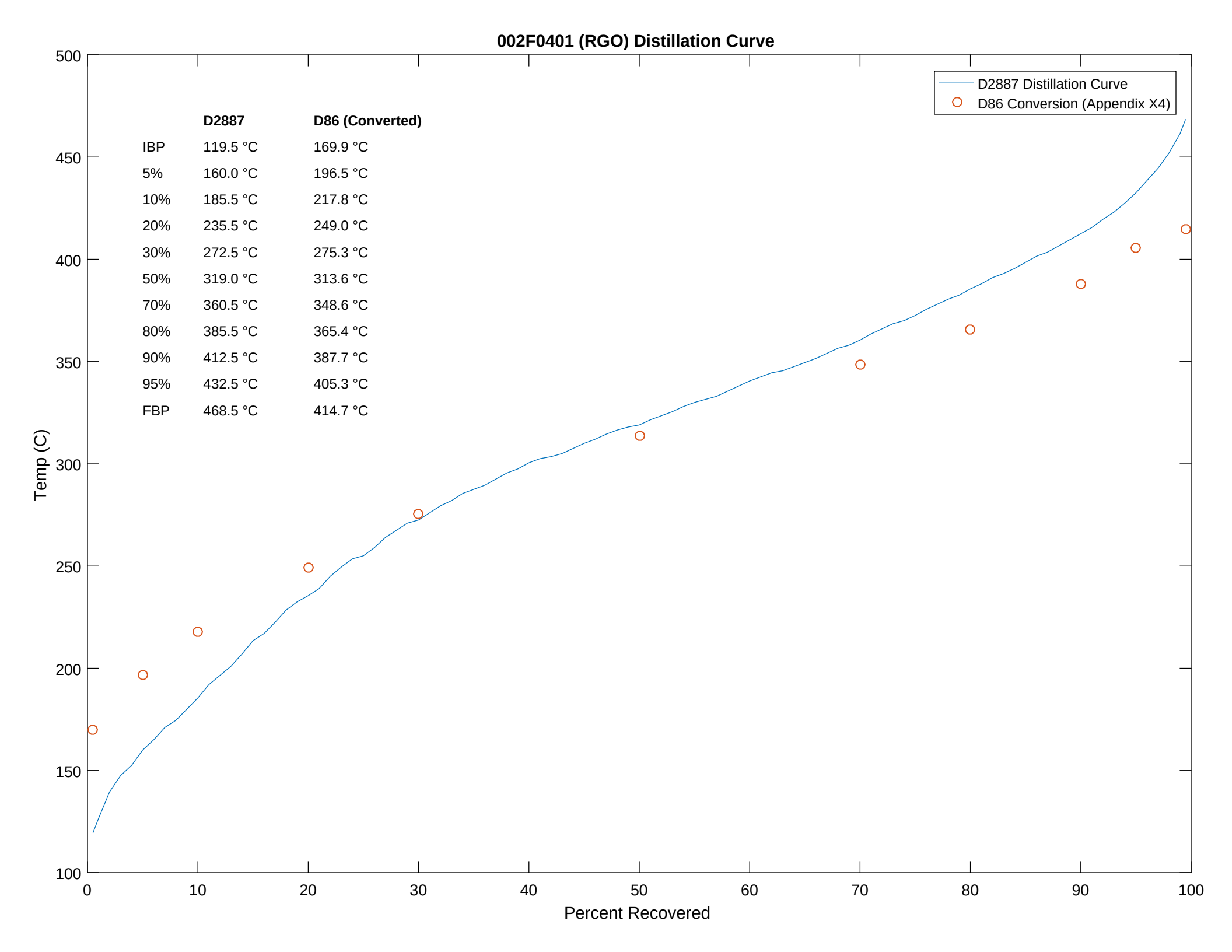


C#	Time (min)	Skew	Response Factor	%Deviation
n-C5	0.157	1.993	0.541	-45.9
n-C6	0.184	1.054	1.274	27.4
n-C7	0.235	1.057	1.113	11.3
n-C8	0.335	0.956	1.048	4.8
n-C9	0.509	0.871	1.021	2.1
n-C10	0.765	0.788	1.000	0.0
n-C11	1.082	0.754	0.989	-1.1
n-C12	1.428	0.686	0.996	-0.4
n-C14	2.129	0.661	0.993	-0.7
n-C15	2.456	0.688	0.985	-1.5
n-C16	2.771	0.703	0.988	-1.2
n-C17	3.071	0.635	0.990	-1.0
n-C18	3.357	0.680	0.960	-4.0
n-C20	3.890	0.669	0.973	-2.7
n-C24	4.830	0.687	0.985	-1.5
n-C28	5.635	0.666	0.992	-0.8
n-C32	6.348	0.712	1.020	2.0
n-C36	7.011	0.784	1.070	7.0
n-C40	7.646	0.750	1.116	11.6
n-C44	8.256	0.699	1.137	13.7



C#	Time (min)	Boiling Point (°C)
n-C5	0.157	36
n-C6	0.184	69
n-C7	0.235	98
n-C8	0.335	126
n-C9	0.509	151
n-C10	0.765	174
n-C11	1.082	196
n-C12	1.428	216
n-C14	2.129	254
n-C15	2.456	271
n-C16	2.771	287
n-C17	3.071	302
n-C18	3.357	316
n-C20	3.890	344
n-C24	4.830	391
n-C28	5.635	431
n-C32	6.348	466
n-C36	7.011	496
n-C40	7.646	522
n-C44	8.256	545


002F0401 (RGO)
C5
C8
C9
C10
C11
C12
C14
C15
C16
C17
C18
C20
C24
C28
C32
C36
C40
C44
FID Response (mV)
0
2000
4000
6000
8000
10000
12000
14000
16000
Retention Time (minutes)
0
1
2
3
4
5
6
7
8


002F0401 (RGO) Distillation Curve
D2887 Distillation Curve
D86 Conversion (Appendix X4)
D2887
D86 (Converted)
IBP 119.5 °C 169.9 °C
5% 160.0 °C 196.5 °C
10% 185.5 °C 217.8 °C
20% 235.5 °C 249.0 °C
30% 272.5 °C 275.3 °C
50% 319.0 °C 313.6 °C
70% 360.5 °C 348.6 °C
80% 385.5 °C 365.4 °C
90% 412.5 °C 387.7 °C
95% 432.5 °C 405.3 °C
FBP 468.5 °C 414.7 °C
Temp (C)
Percent Recovered
100
150
200
250
300
350
400
450
500
0
10
20
30
40
50
60
70
80
90
100

Appendix A: Process Flow

Run n-alkanes Standard
18.3

- Check that the Retention time vs Boiling point curve is essentially a straight line from n-C9 to n-C44

Verify Column Resolution
18.3 - Fig 3

- Using the peaks for n-C16 and n-C18
  - Retention time for peak (R)
  - Peak width (W) at 1/2 max height
- $Resolution = \frac{2(R_{C18} - R_{C16})}{1.699(W_{C16} + W_{C16})}$ Typical value: 4-11

Check Peak Skewness
18.3 - Fig 4

- Area from the peak to the right until reaching 10% peak height (R)
- Area from the peak to the left until reaching 10% peak height (L)
- $Skewness = \frac{R}{L}$ Typical value: 0.8-1.30

Check n-alkanes Response Factors
9.3.2

- For each n-alkane in the standard calculate the response factor by comparing the Mass and Area of the n-alkane peak with the Mass and Area of n-C10.
- $Response\ Factor = \frac{Mass_{Cn}/Area_{Cn}}{Mass_{C10}/Area_{C10}}$
- Response Factors should deviate from 1.0 by less than 10%.

Baseline Offsets
12.2

- Verify that no sample has eluted within the first second worth of data
- Verify that there are at least 5 samples within this first second (≥5Hz sampling rate)
- Calulate the mean and standard deviation of the first second worth of data
- Remove any data points from the first second that are further than one standard deviation from the mean.
- Calculate the mean of the remaining data points and subtract the result from all points in the chromatogram

Blank Offset
12.3

- Repeat the Baseline Offset correction on the no injection blank run.
- Subtract the Baseline Offset corrected blank chromatogram from the sample chromatogram

Start and End Elution Times 12.4

- Integrate each second's worth of data in the baseline&blank corrected sample chromatogram
- Find elution time (n), the first second where: $\frac{\text{area(n)}-\text{area(n}-1)}{totalArea} \times 100 > 0.00001\%$
- Find elution time (n), the last second where: $\frac{\text{area(n)}-\text{area(n}+1)}{totalArea} \times 100 > 0.00001\%$

Sample Total Area 12.6

- Sample Total Area = Integral between the previously calculated elution start and end times
- Normalize all chromatogram slices as a percentage of the Sample Total Area
- Create another array holding cumulative percent recovery for each slice

Retention Times for Various % Recovery 12.8

- Calculate the retention time of the slice just before passing the desired cumulative percents:
  - Initial Boiling Point (0.5% recovery) 12.8.1
  - Final Boiling Point (99.5% recovery) 12.8.2
  - Intermediate Boiling Points (1-99%) 12.8.3

Exact Retention Times for Various % Recovery 12.9.1

- Calculate the fraction of the next slice needed to achieve the exact % recovery desired
- Use Equation 3 (Section 12.9.1.2) and Equation 5 (Section 12.9.1.4)
- This will give the exact retention time for X% recovery.

Calculate Corresponding Boiling Points 12.9.2

- Use the interpolation methods in 12.9.2 to interpolate the boiling point curve and find the boiling point corresponding to the exact retention times calculated in the previous step.
- Round the calculated boiling points to the nearest 0.5 °C

Conversion to D86 Curve Appendix X4

- If the sample is a Jet Fuel or Diesel Fuel and a D86 curve is required:
- Apply the scaling factors in Appendix X4 to simulate an D86 distillation curve.

The results presented in this report relate only to the samples tested.
This report shall not be duplicated, except in full, without written approval from MAP Laboratories LLC

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