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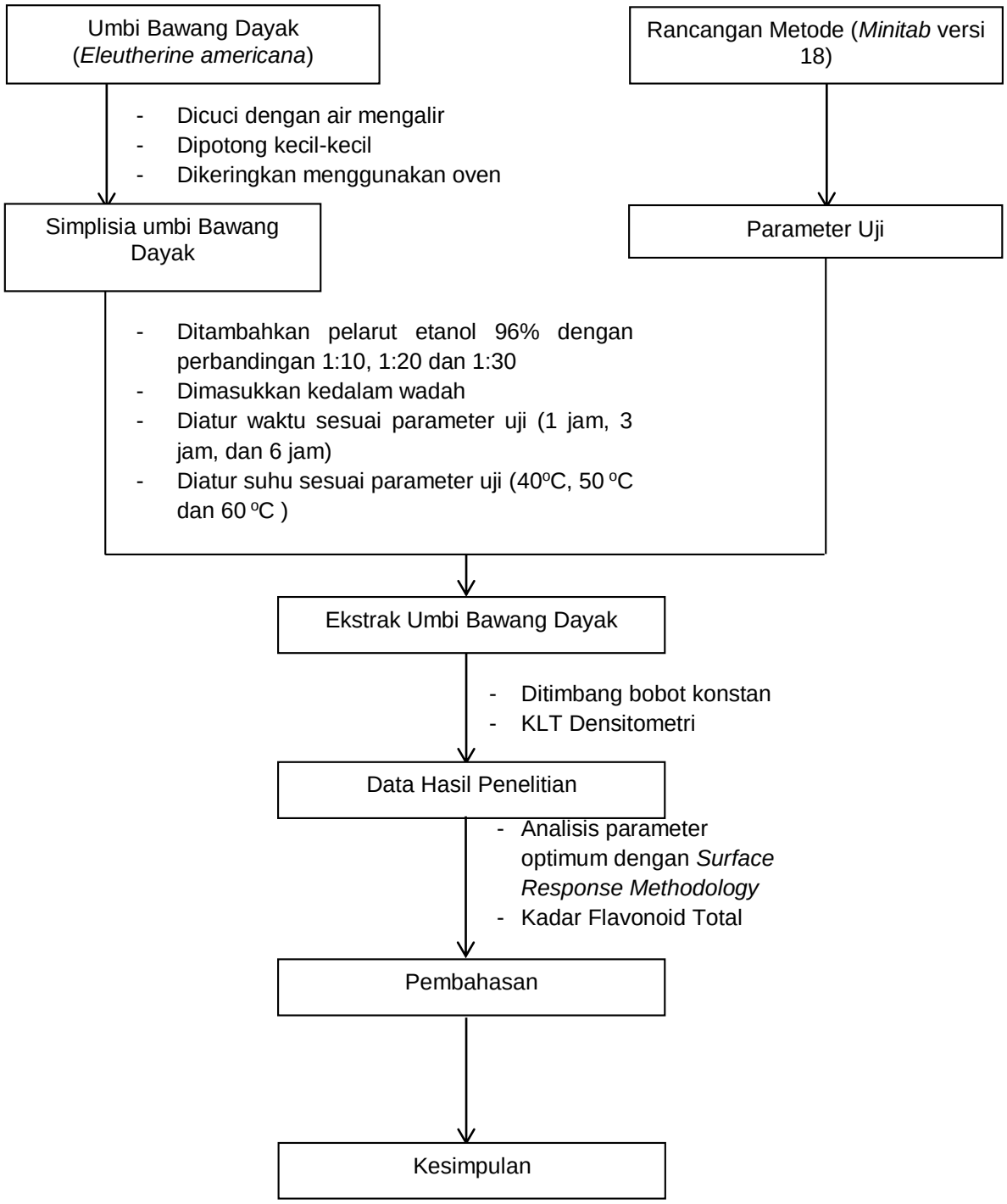
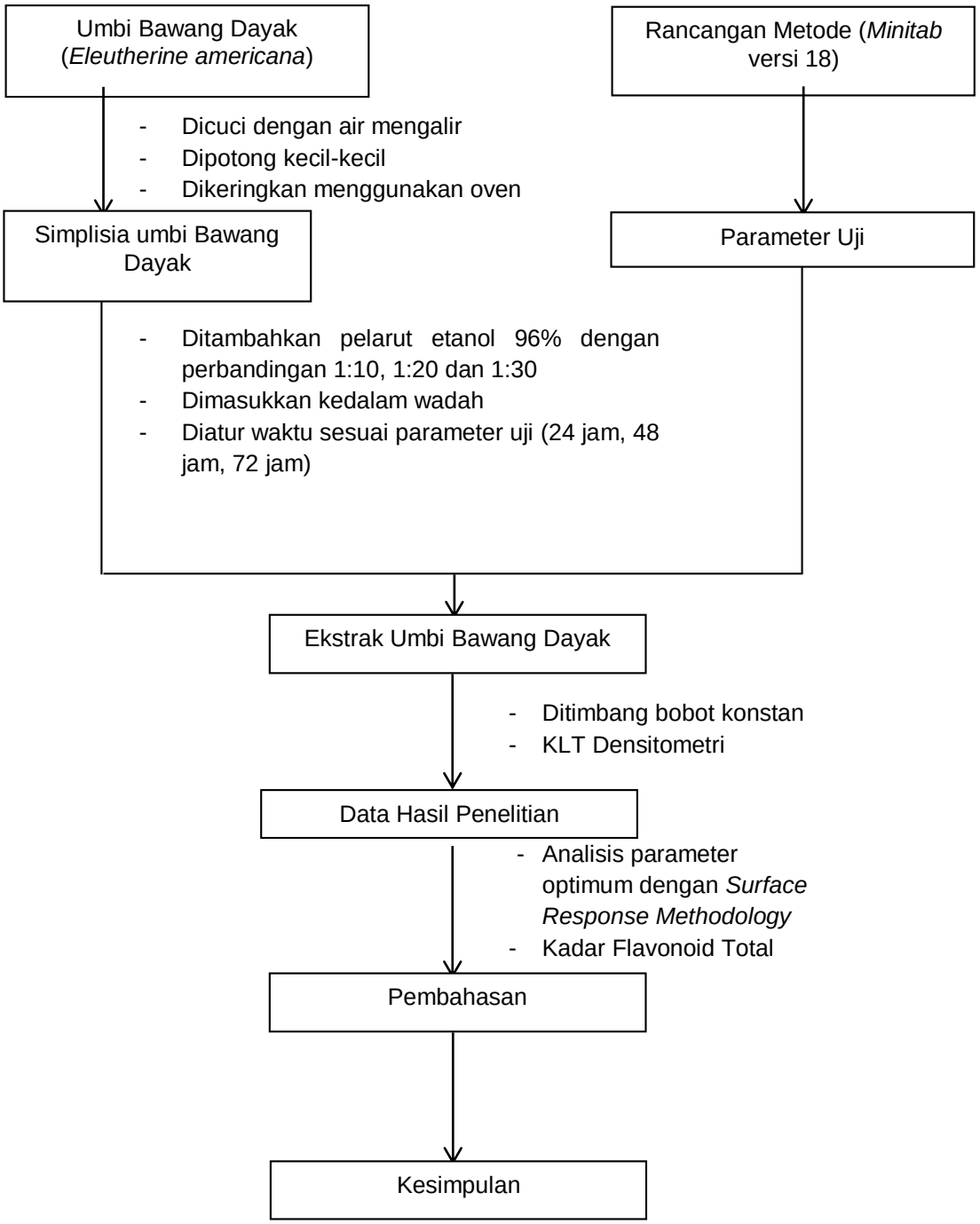
LAMPIRAN

Lampiran 1. Skema Kerja Penelitian

a. Skema Kerja Metode Digesti



b. Skema Kerja Metode Maserasi



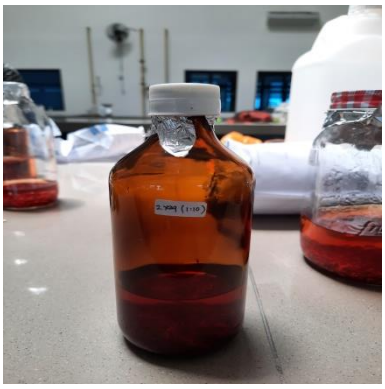
Lampiran 2. Dokumentasi Penelitian

Gambar 18. Proses pengumpulan sampel

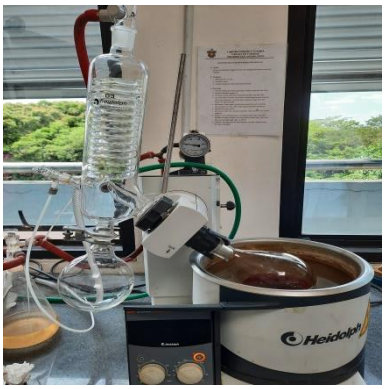
Gambar 19. Proses penimbangan simplisia

Gambar 20. Proses Pengerjaan susut pengeringan

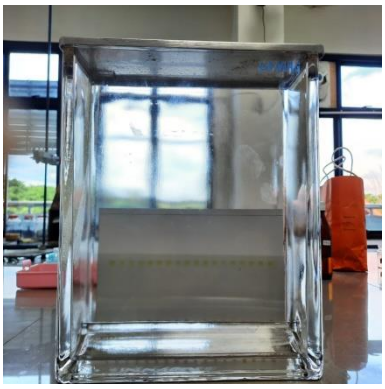
Gambar 21. Proses ekstraksi dengan digesti



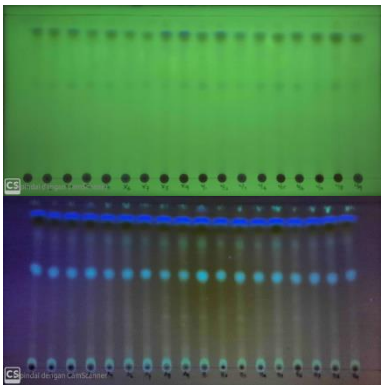
Gambar 22. Proses Ekstraksi metode Maserasi



Gambar 23. Proses Penguapan Pelarut



Gambar 24. Proses Elusi dengan metode KLT



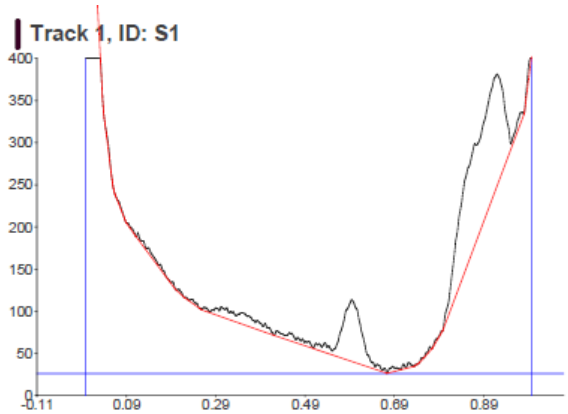
Gambar 25. Hasil pengamatan di bawah uv 254 dan 366

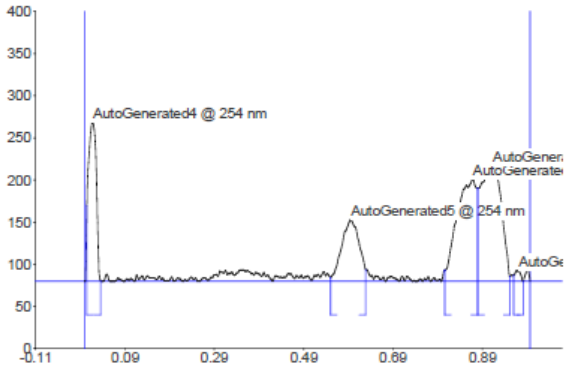
Gambar 26. Instrumen alat densitometri

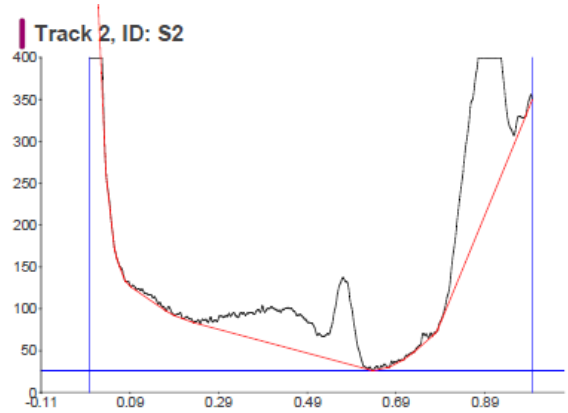
Gambar 27. Proses pembuatan larutan uji

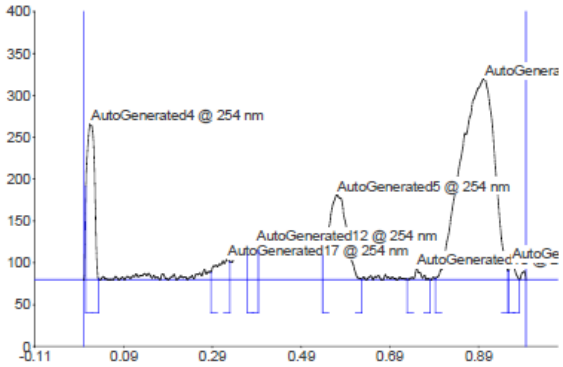
Lampiran 3. Data Hasil TLC-*Scanner*

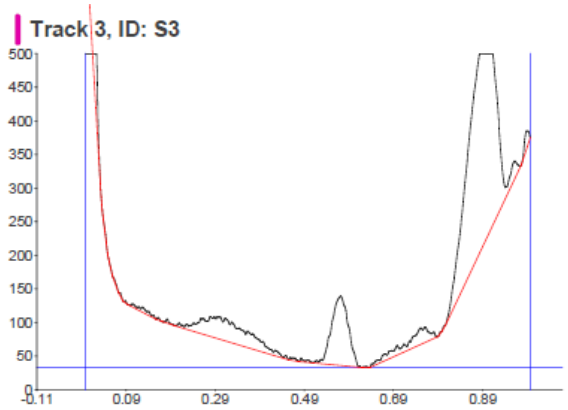
1. Data hasil TLC-*scanner* ekstrak etanol 96% metode digesti dengan rasio pelarut 1:10 dan 1:20 pada UV 254

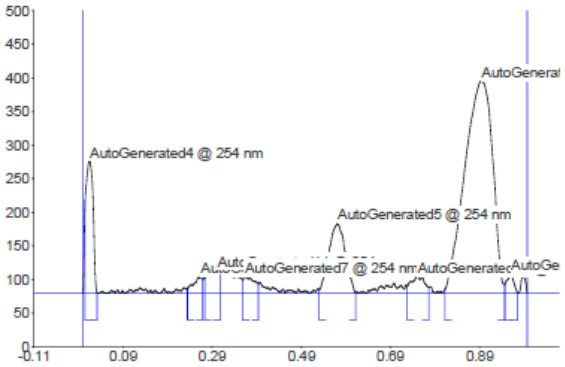


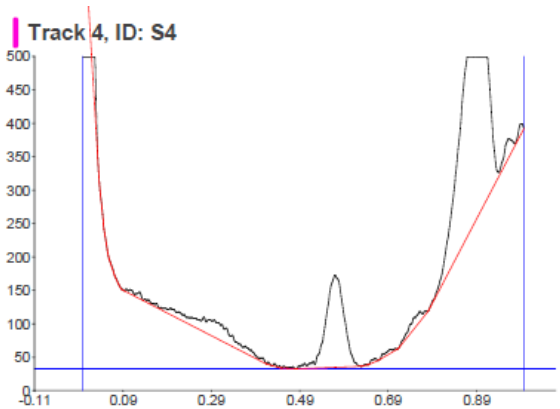








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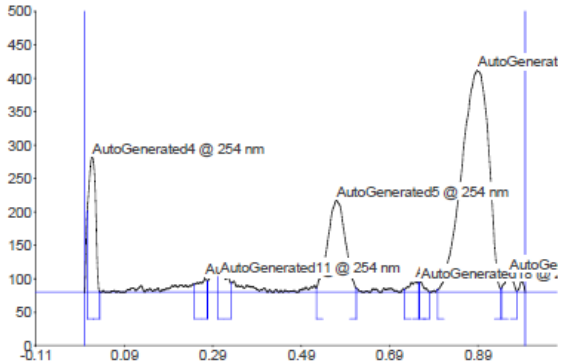
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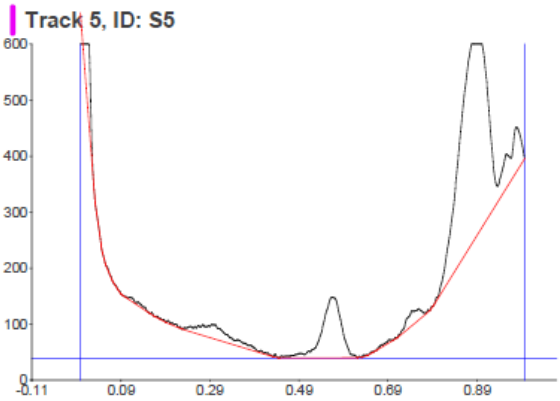
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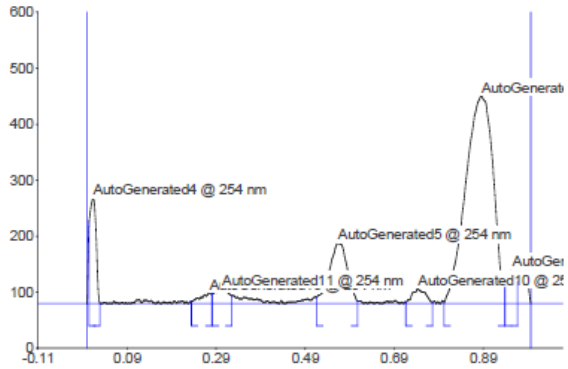
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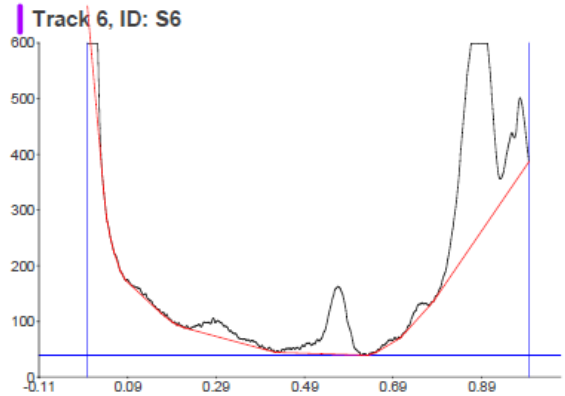
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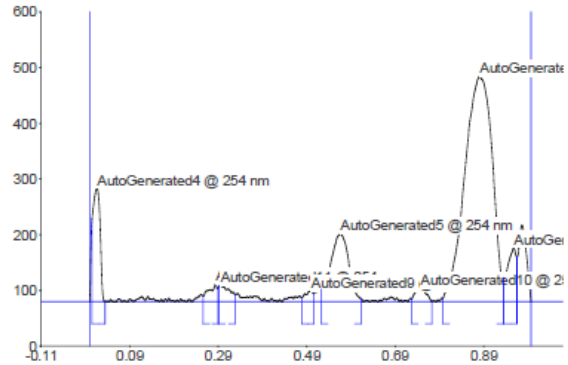
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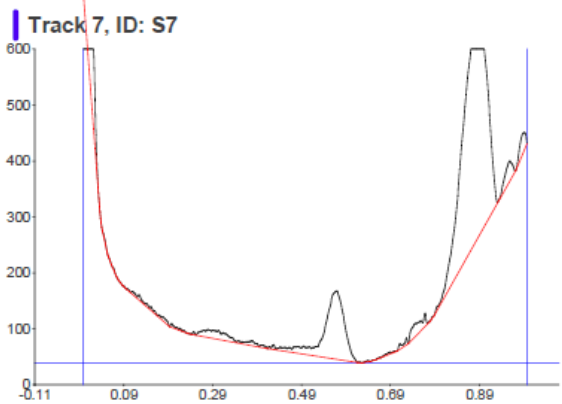
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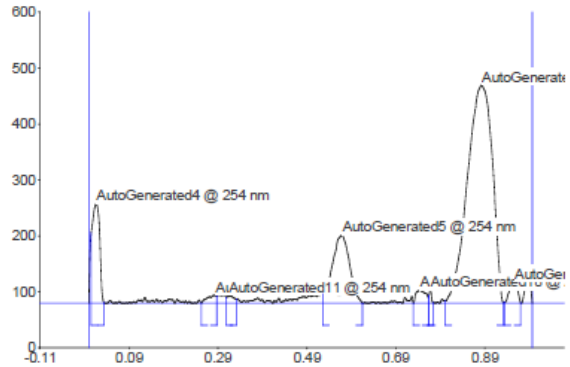
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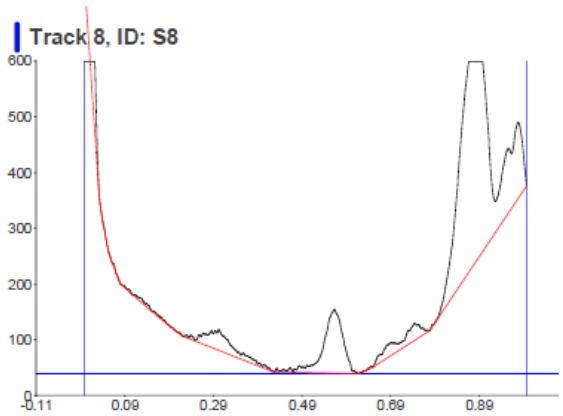
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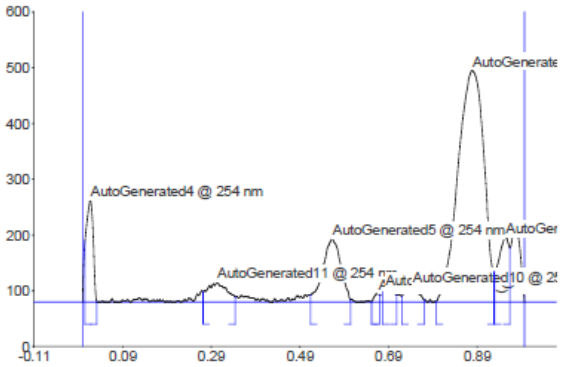
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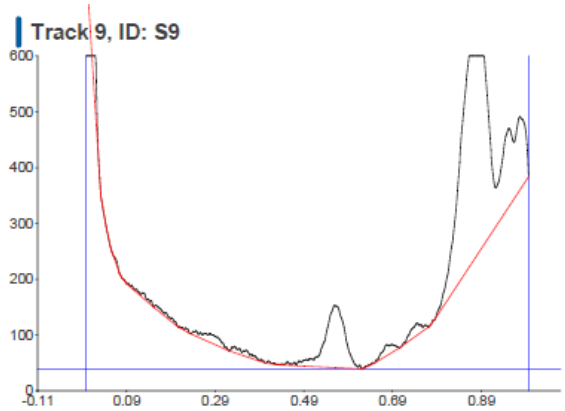
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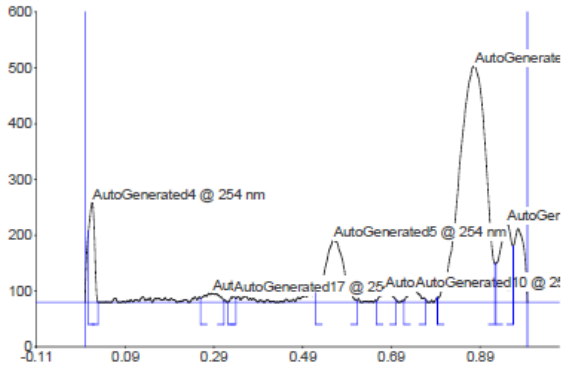
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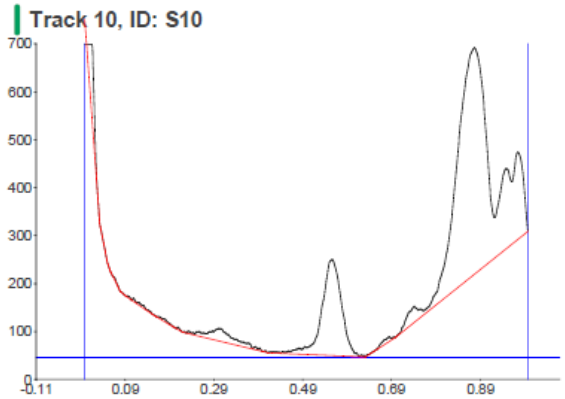
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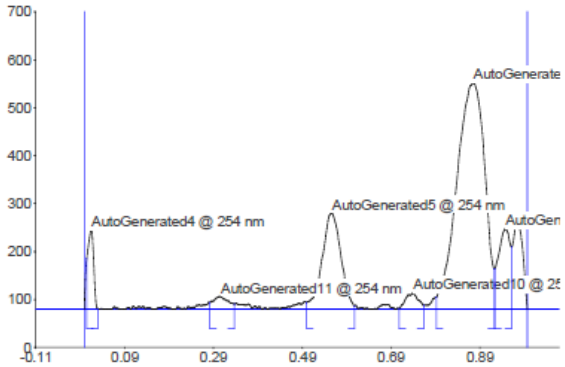
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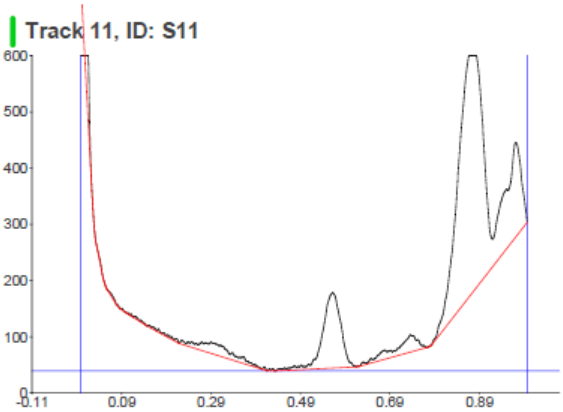
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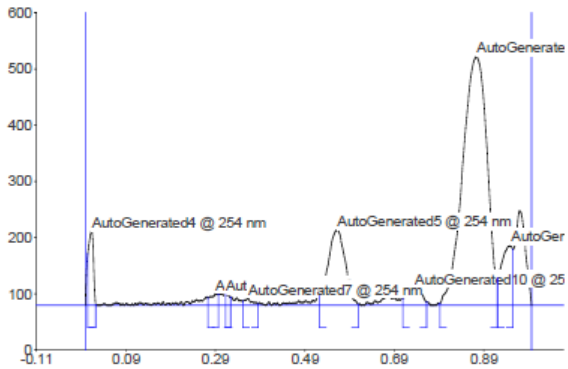
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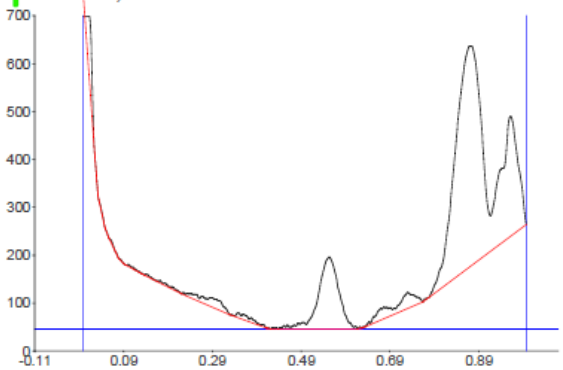

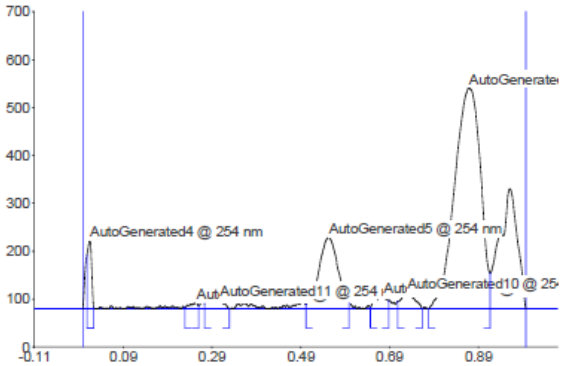

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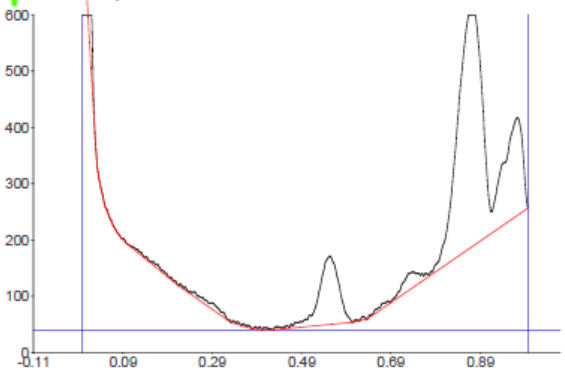

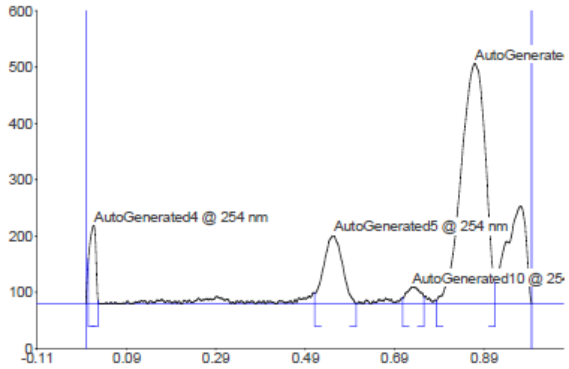

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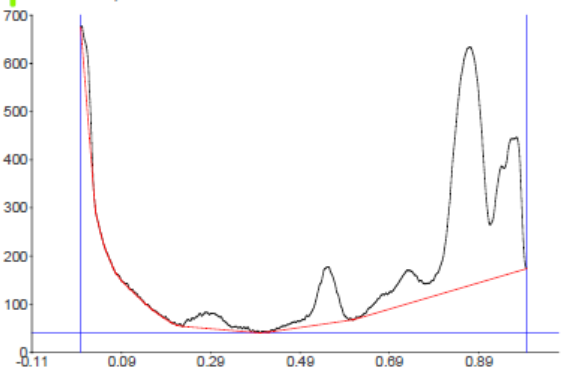

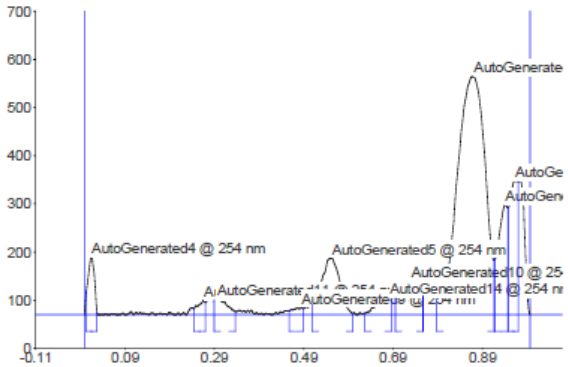

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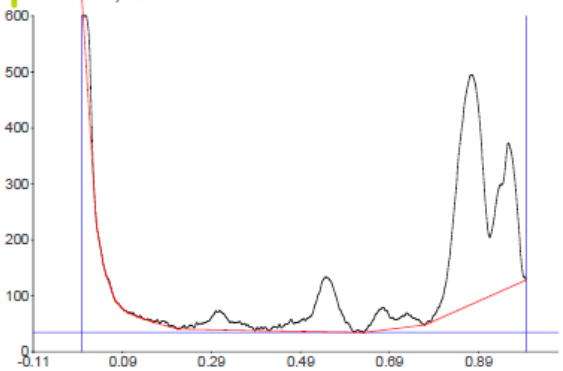

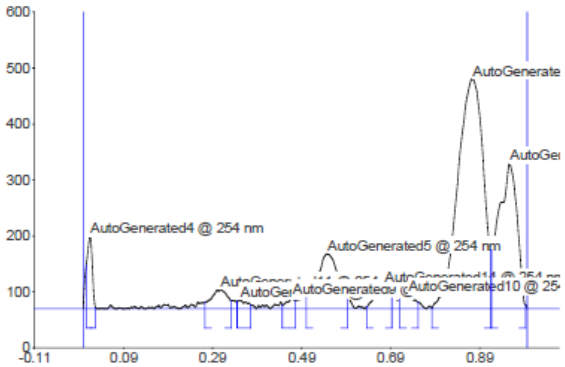

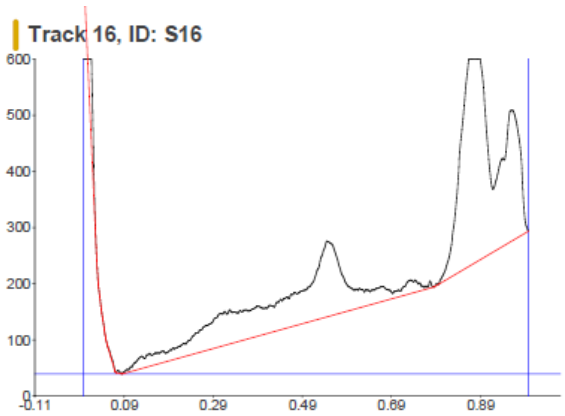
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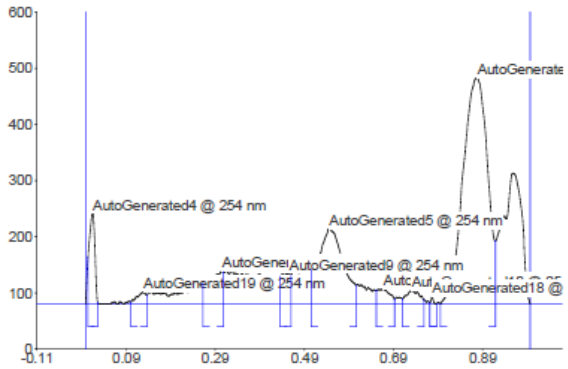
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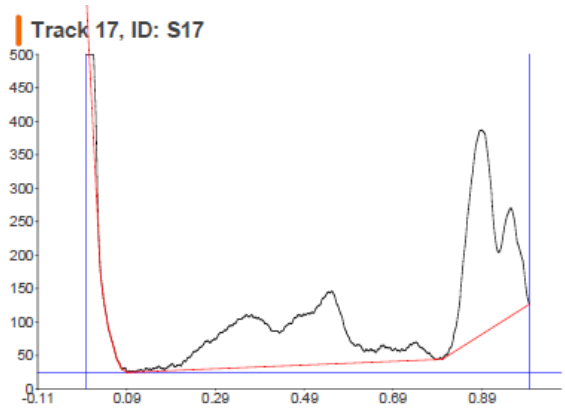
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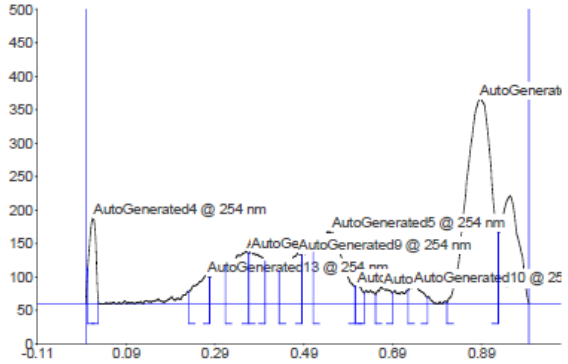
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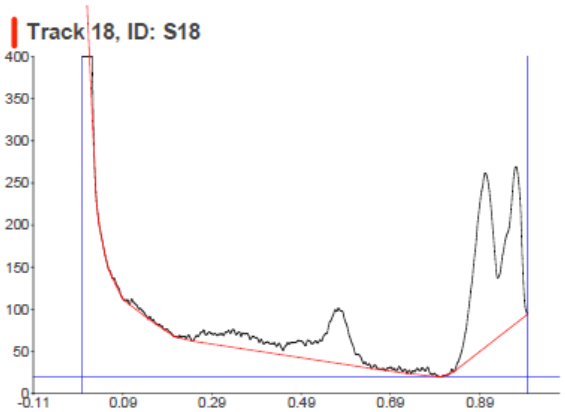
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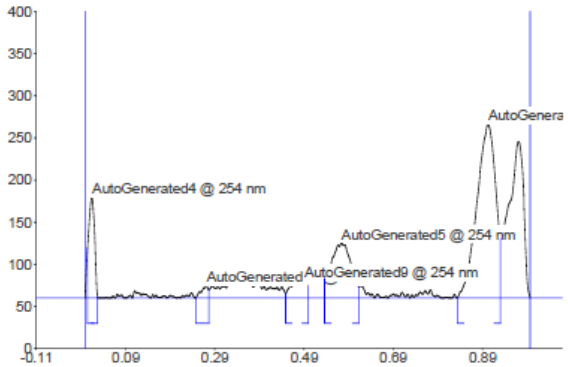
400
350
300
250
200
150
100
50
0
-0.11
0.09
0.29
0.49
0.69
0.89
AutoGenera
AutoGenerated4 @ 254 nm
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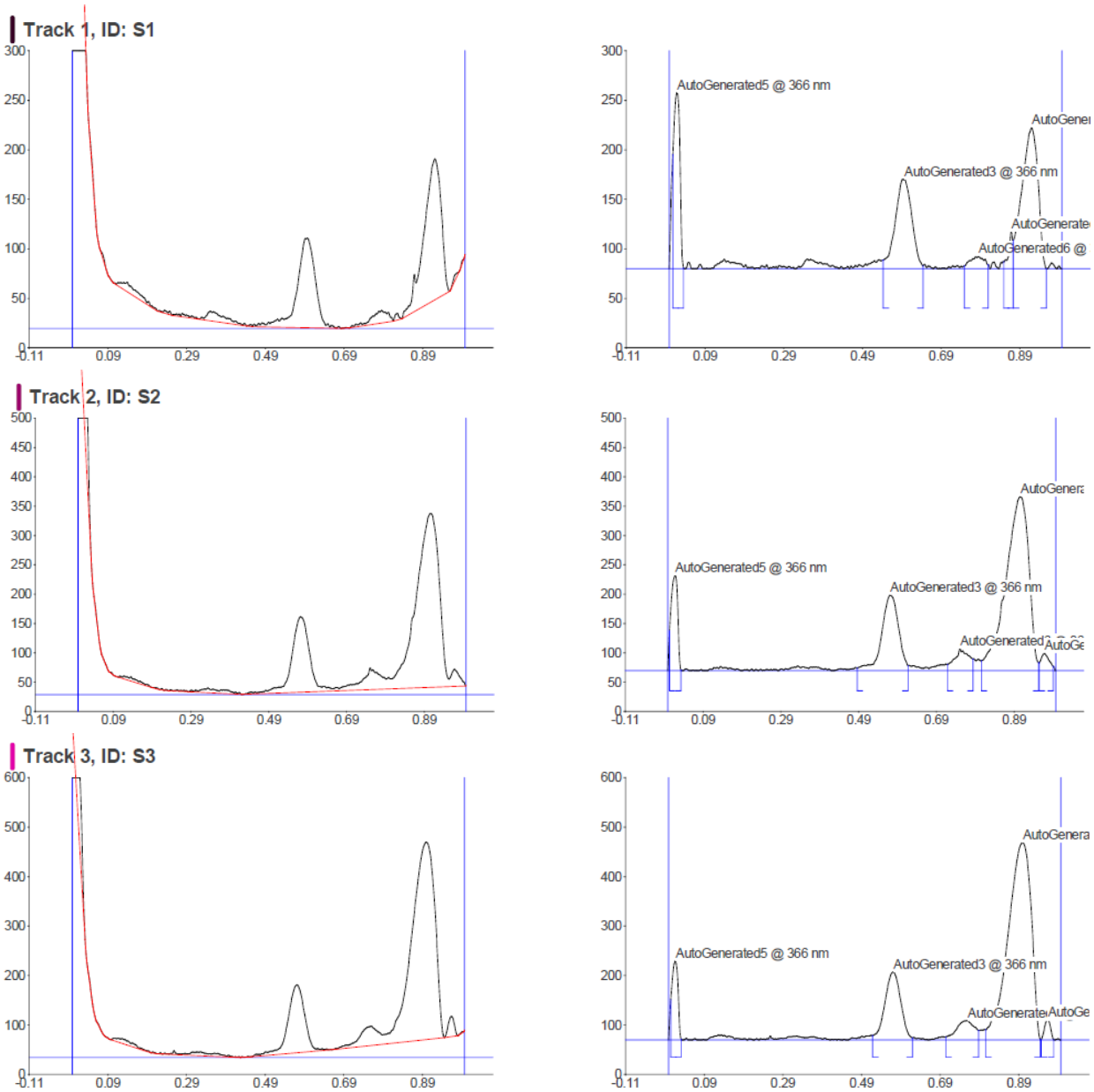
2. Data hasil TLC-*Scanner* ekstrak etanol 96% metode digesti dengan rasio pelarut 1:10 dan 1:20 pada UV 366.



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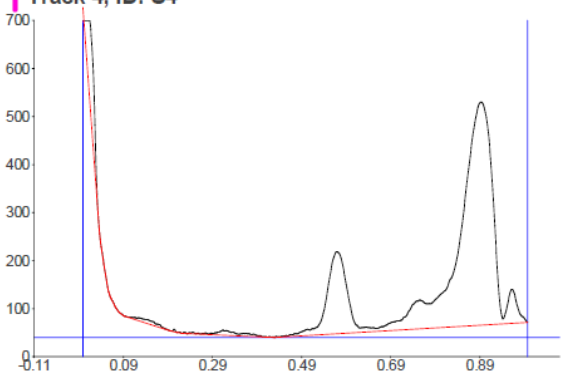

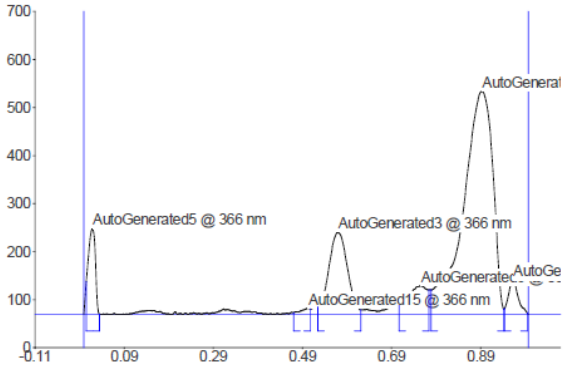

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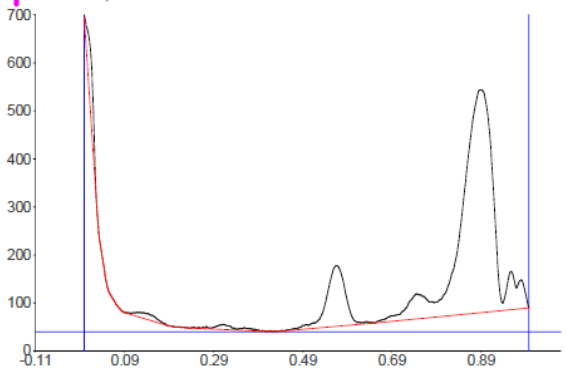

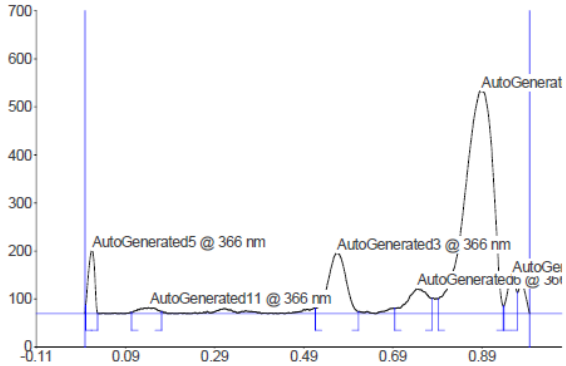

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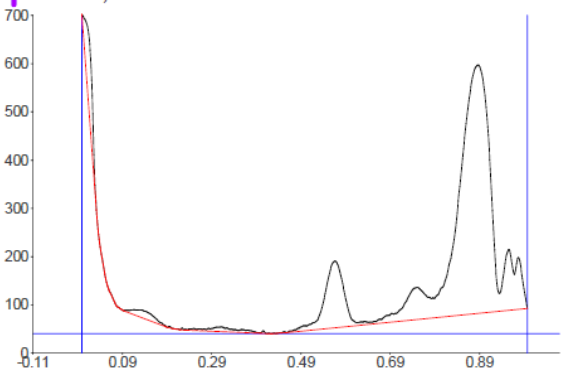

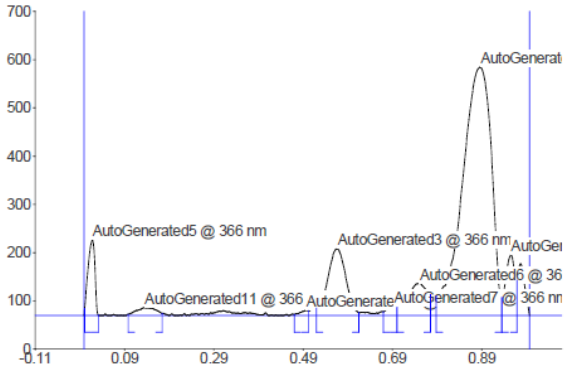

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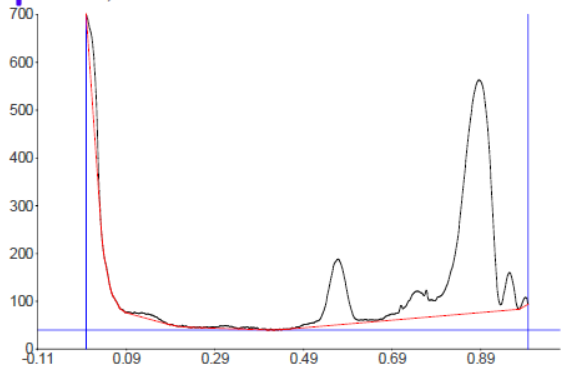

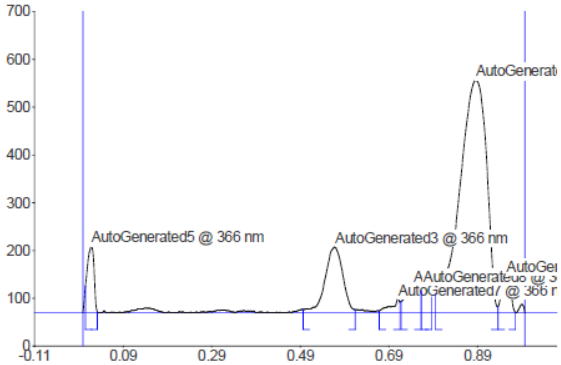

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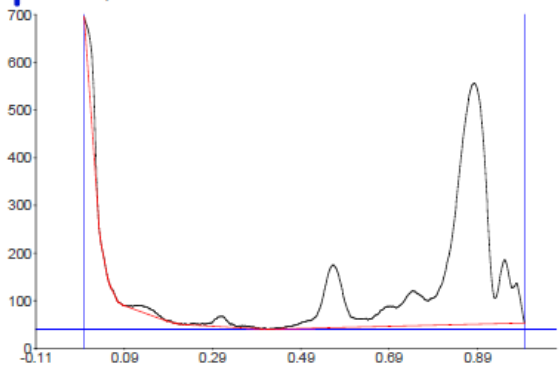

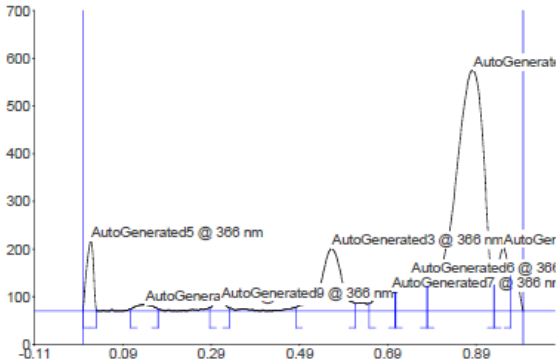

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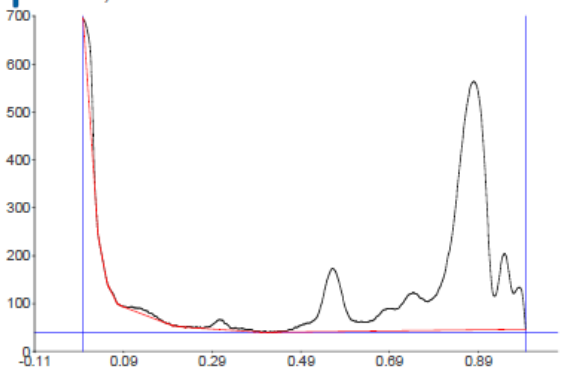

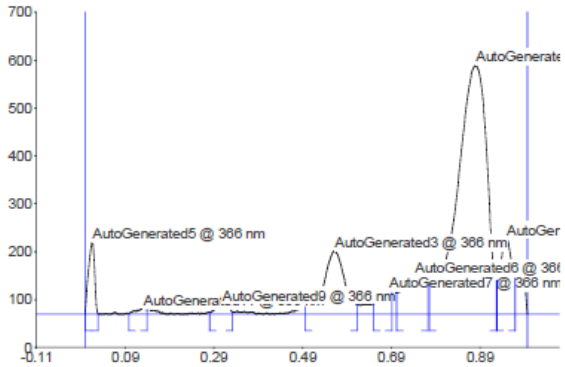

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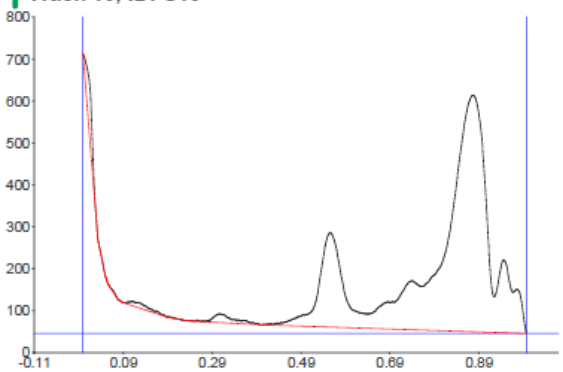

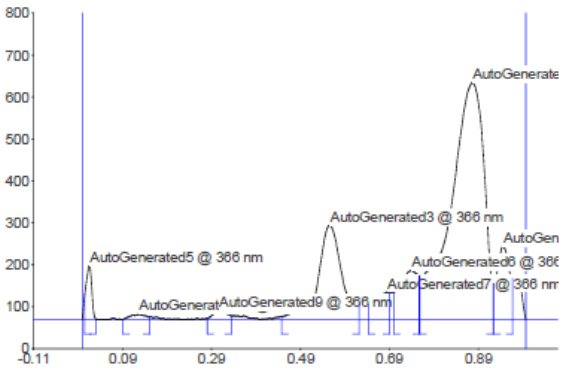

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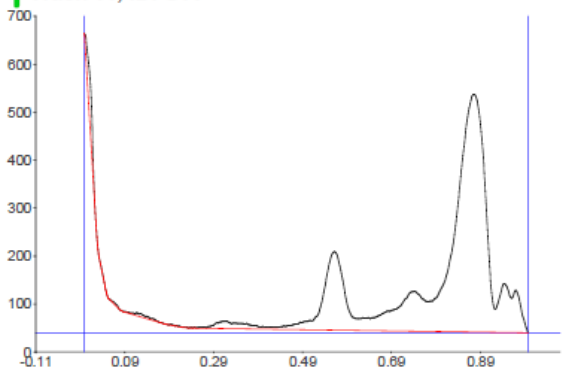

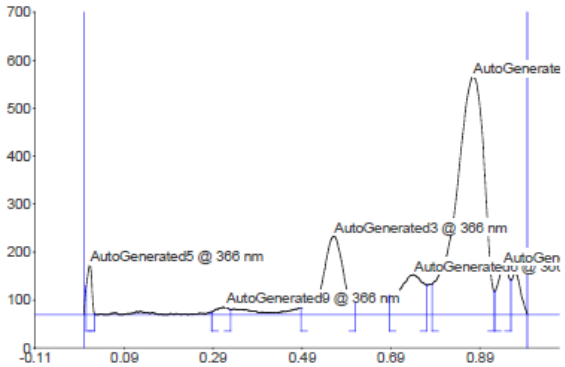

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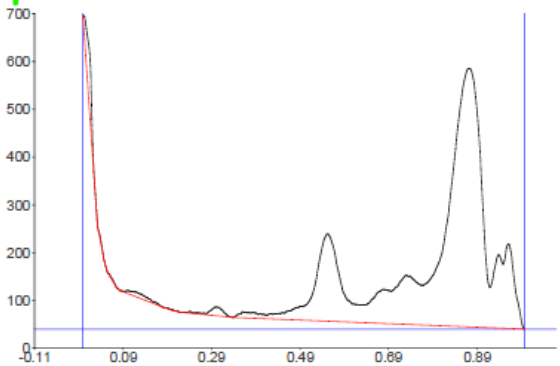
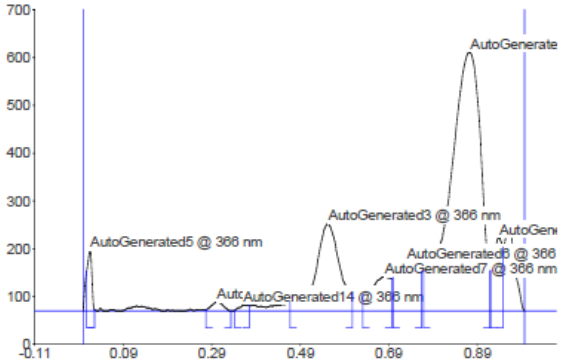
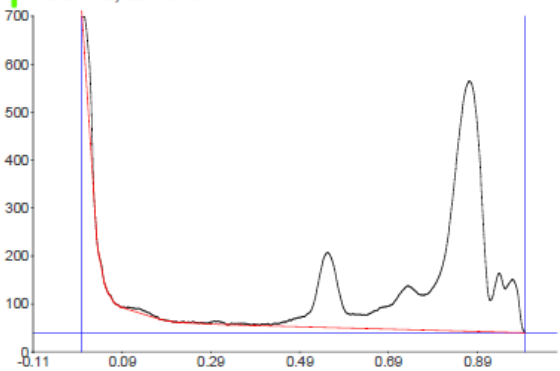
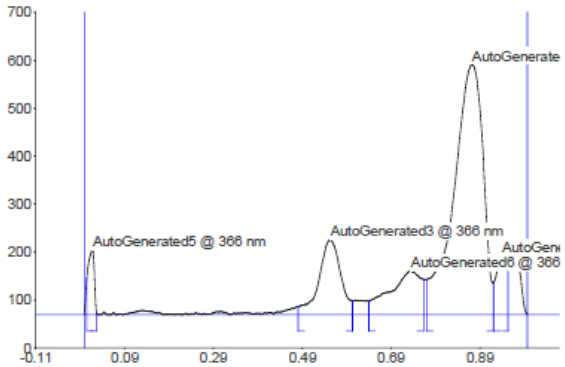




Track 13, ID: S13





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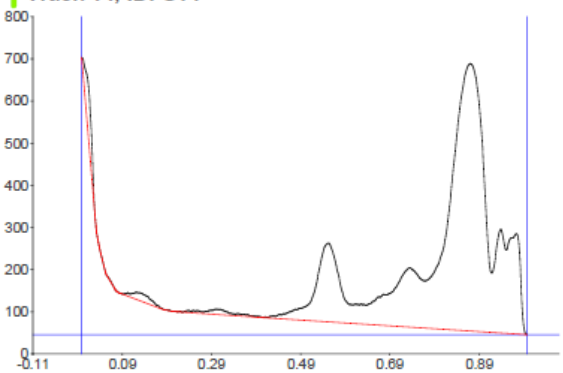

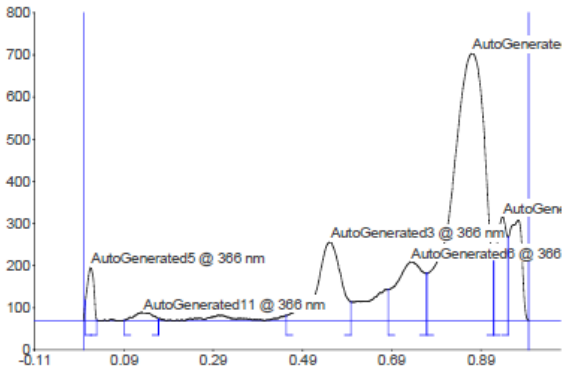

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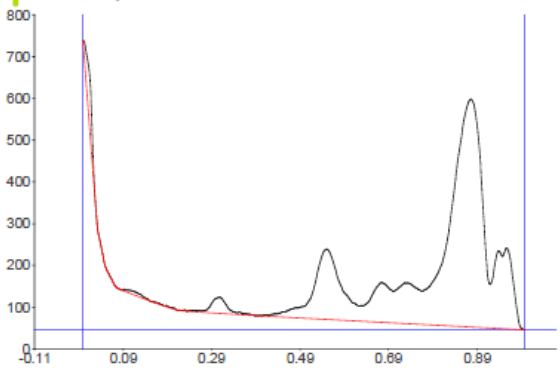

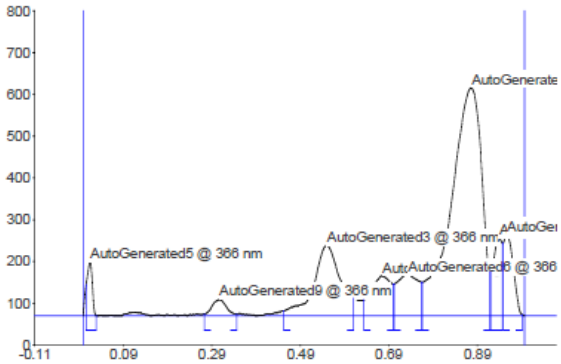

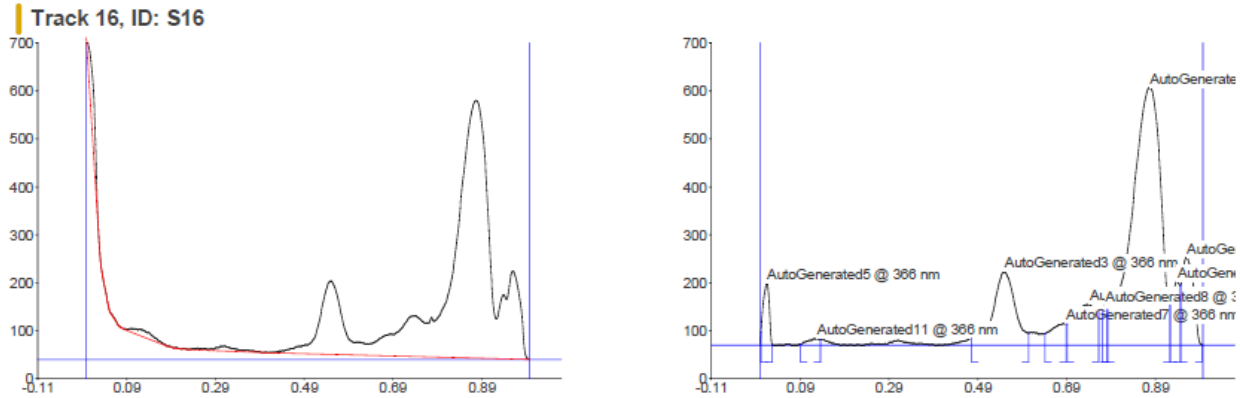
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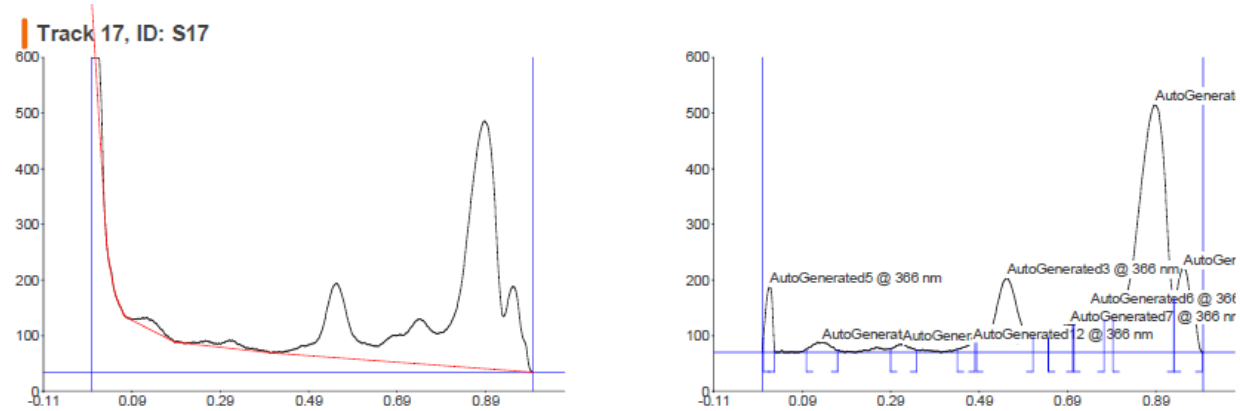
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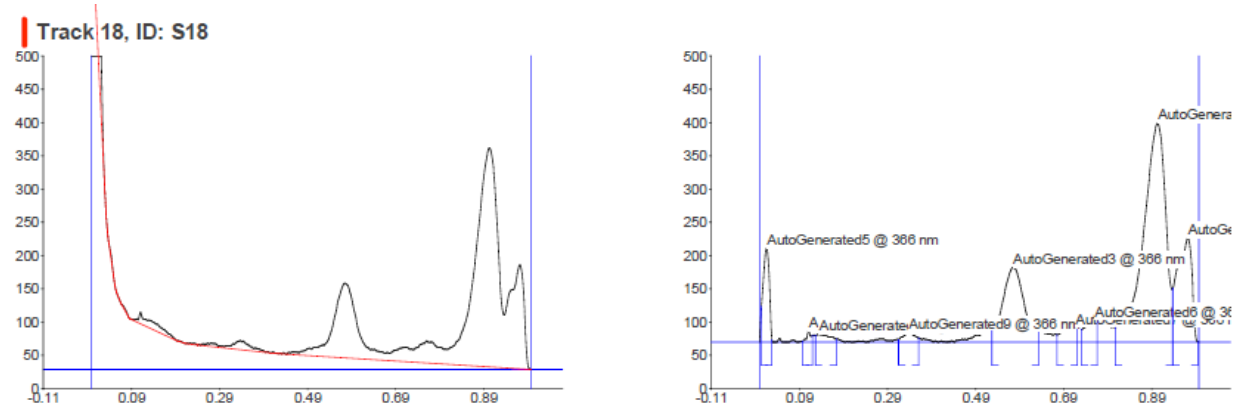
Track 18, ID: S18
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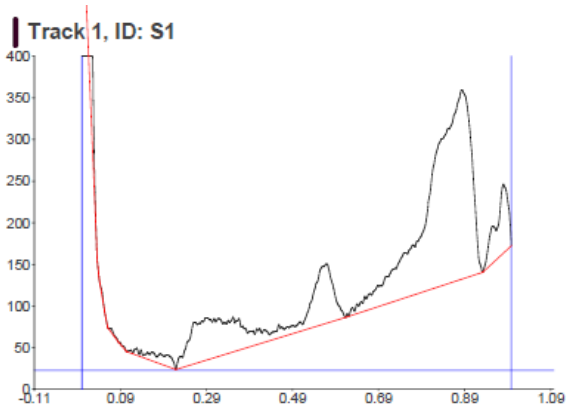
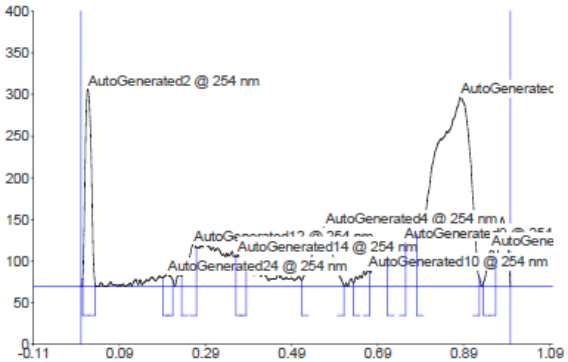
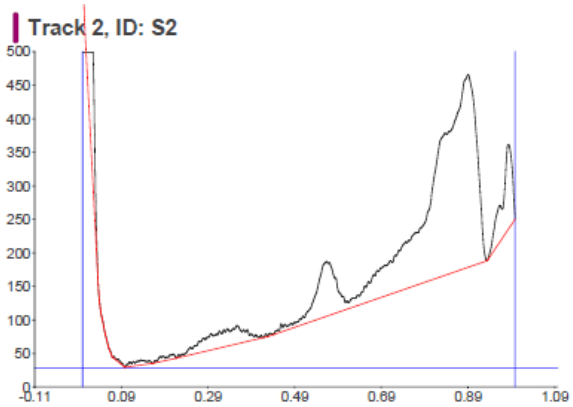
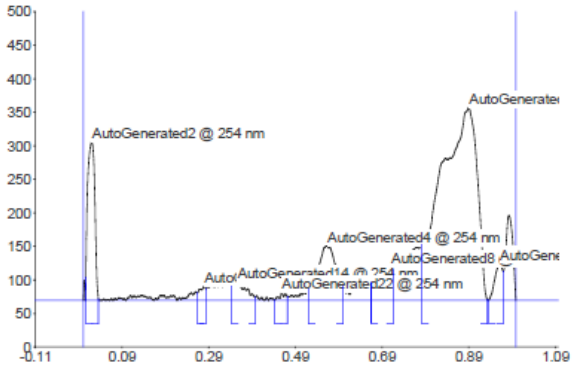
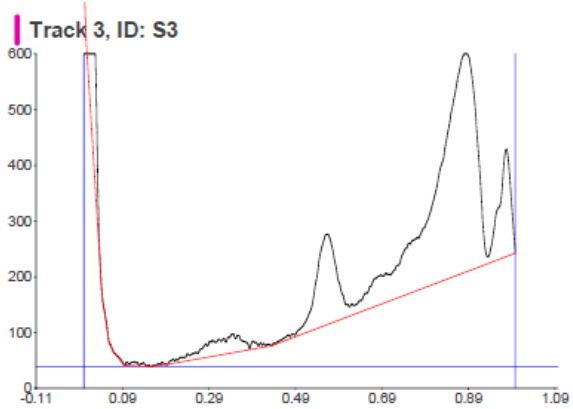
3. Data hasil TLC-*Scanner* ekstrak etanol 96% metode digesti dengan rasio pelarut 1:30 dan metode maserasi pada UV 254.

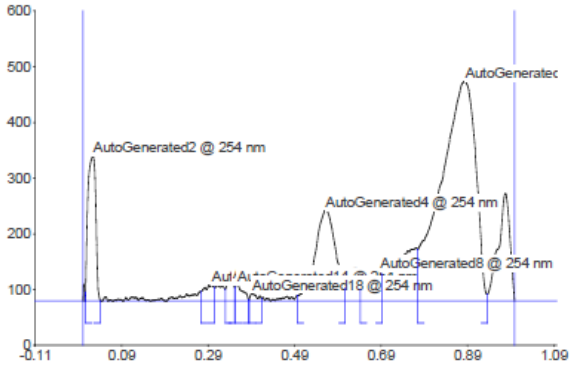


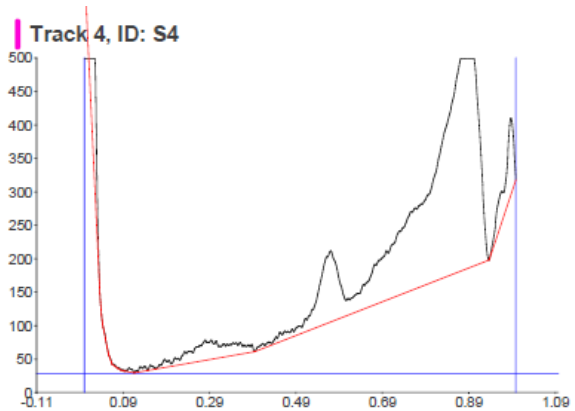


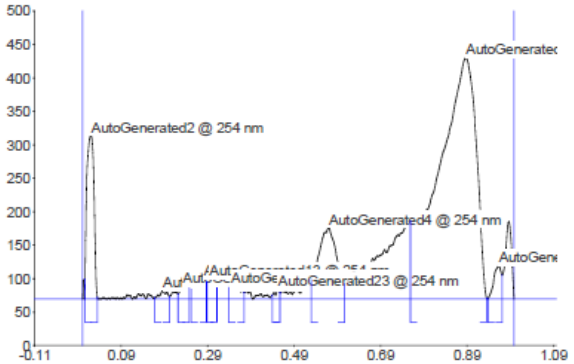









Track 4, ID: S4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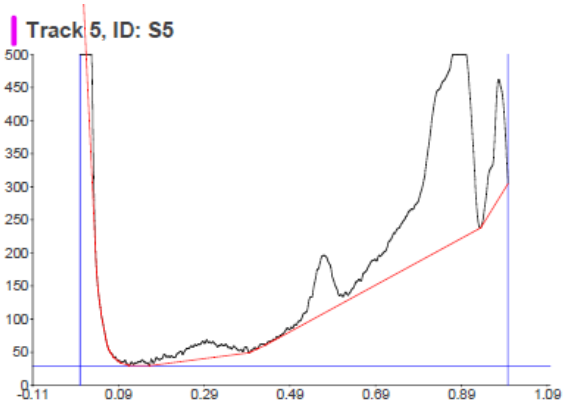
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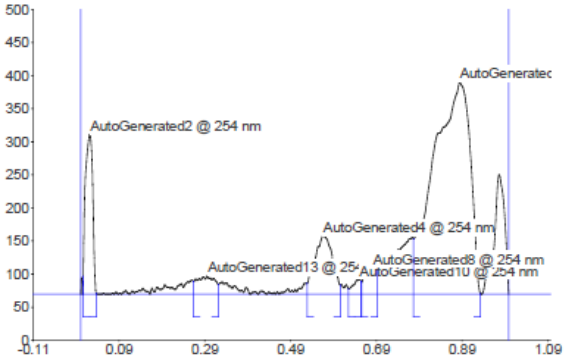
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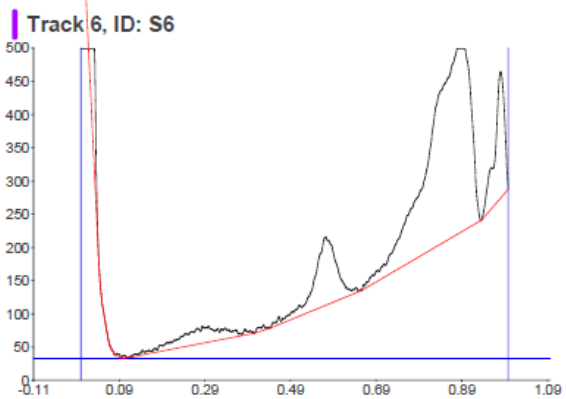
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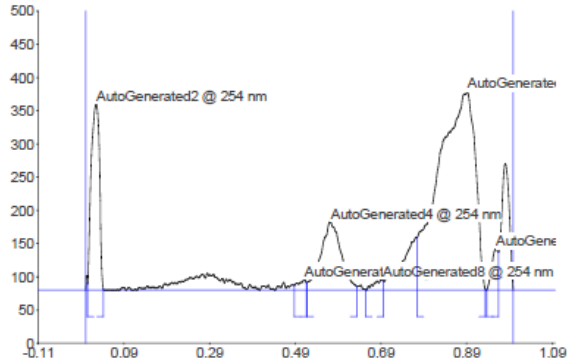
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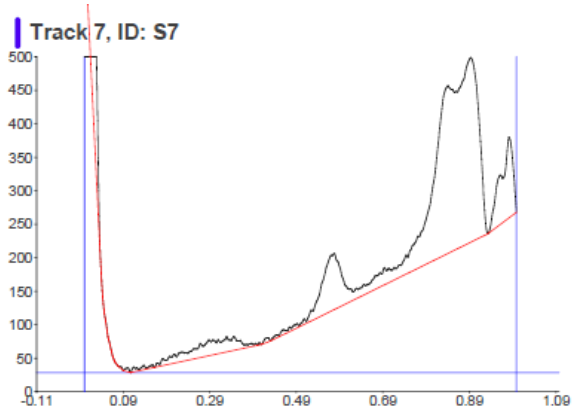
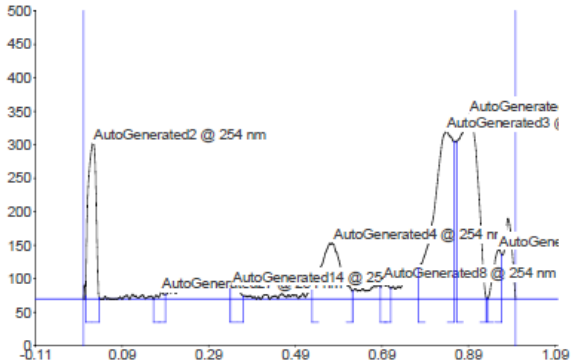

Track 7, ID: S7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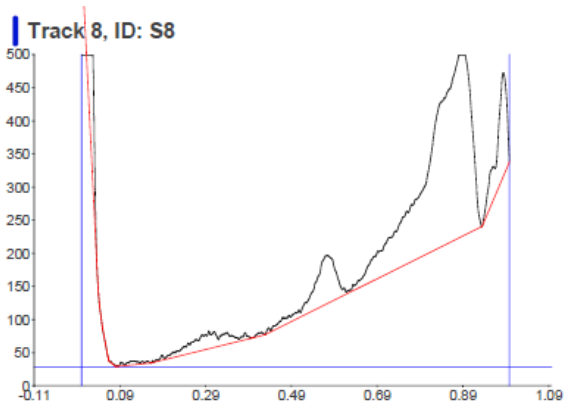
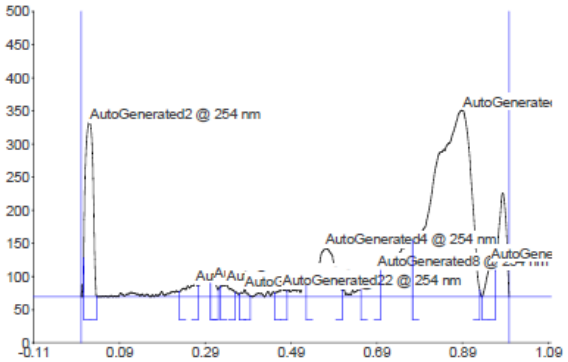

Track 8, ID: S8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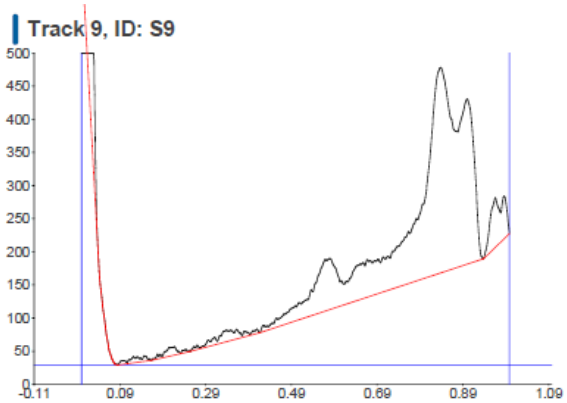
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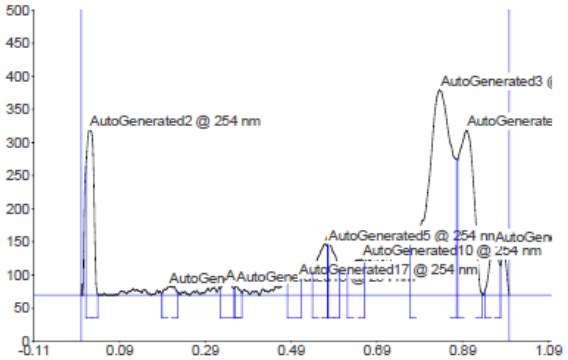
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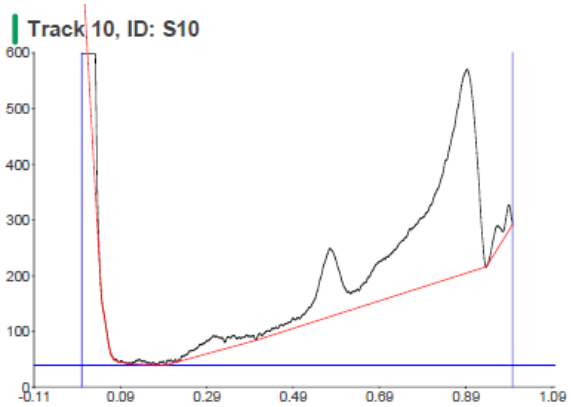
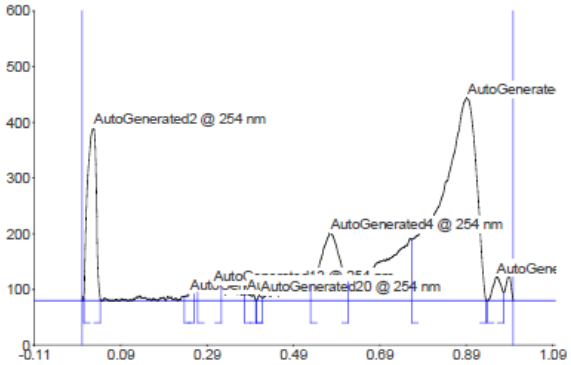

Track 10, ID: S10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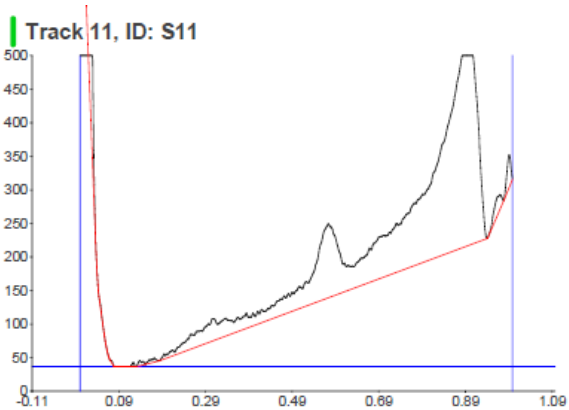
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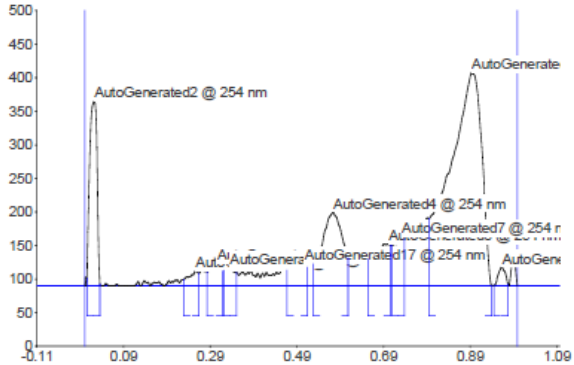
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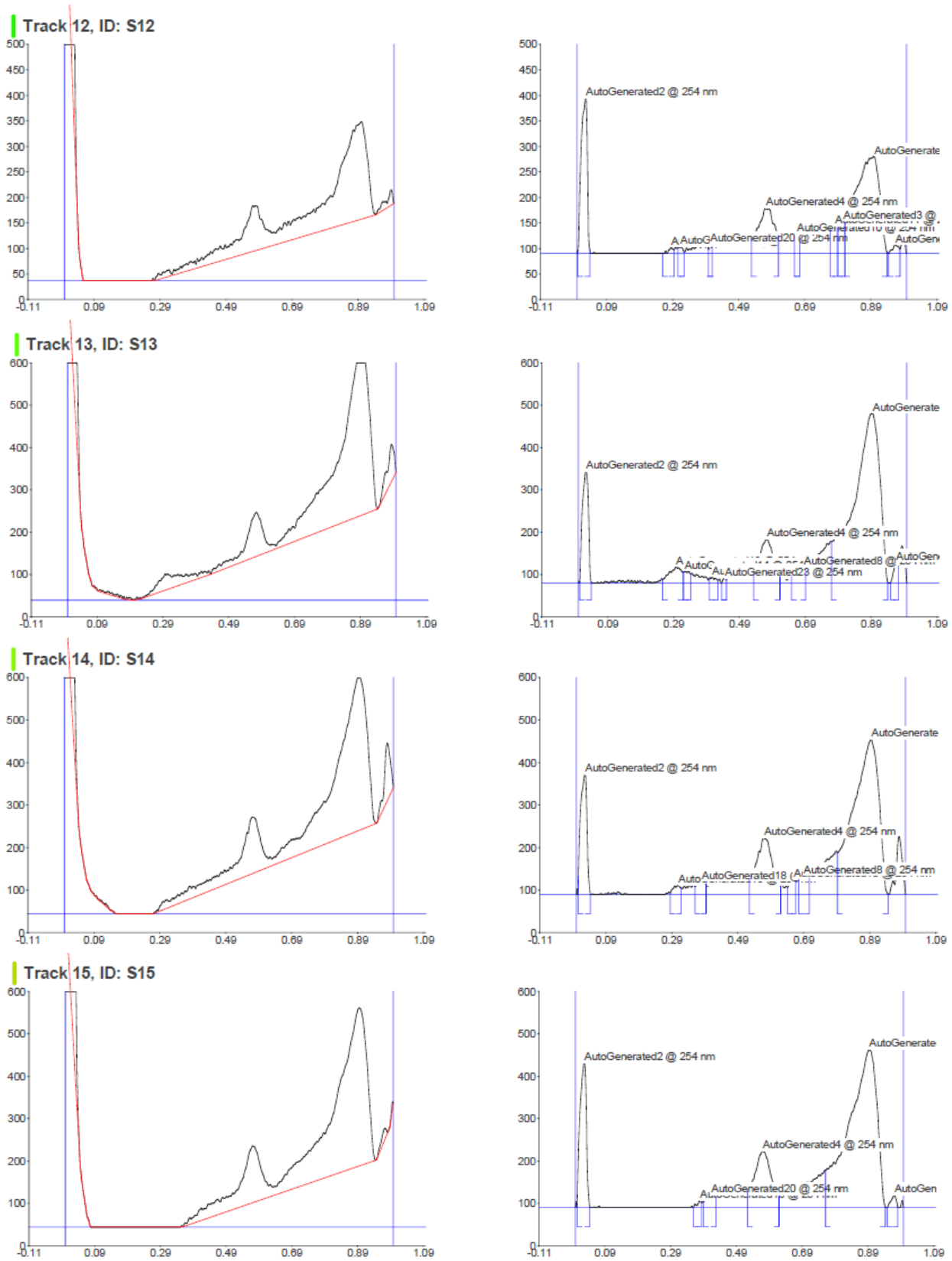
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Track 13, ID: S13
AutoGenerate
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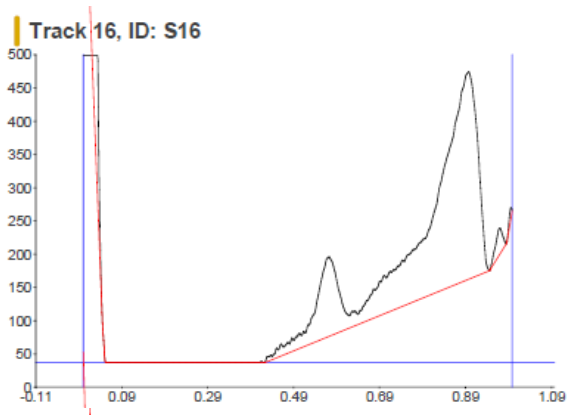
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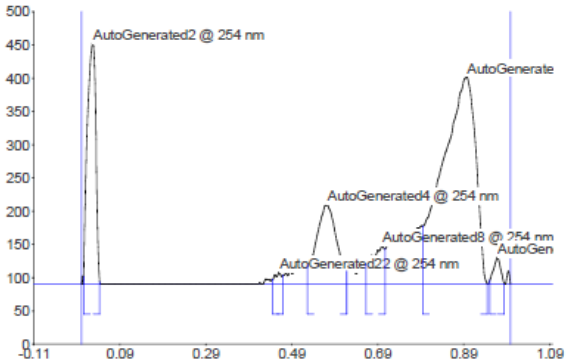
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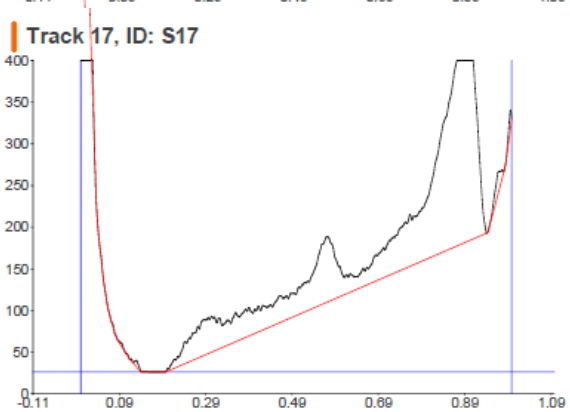
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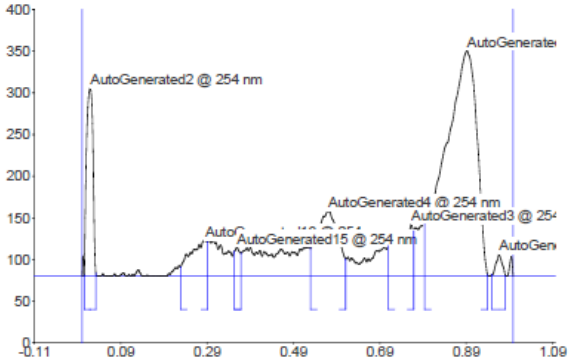
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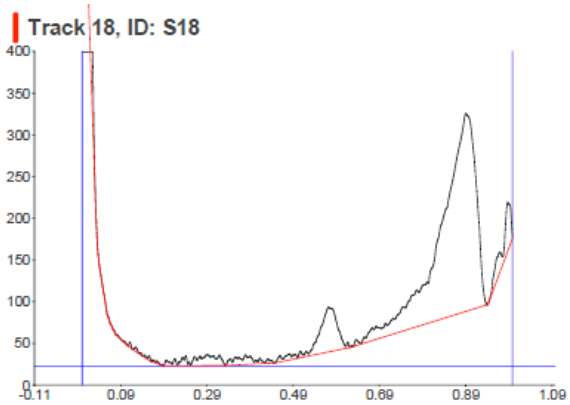
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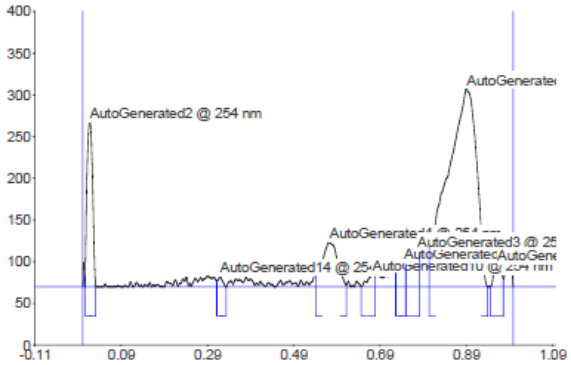
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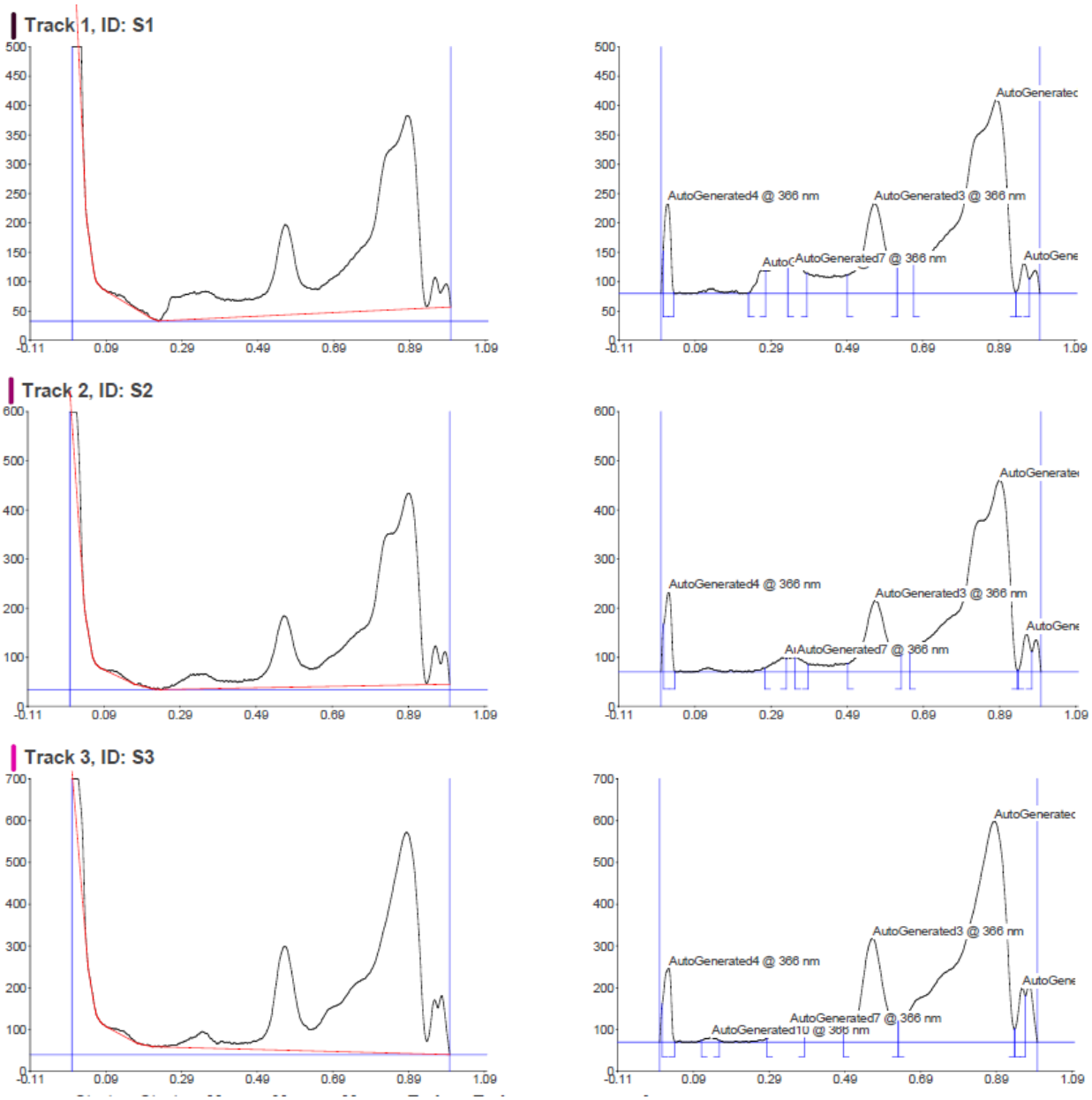
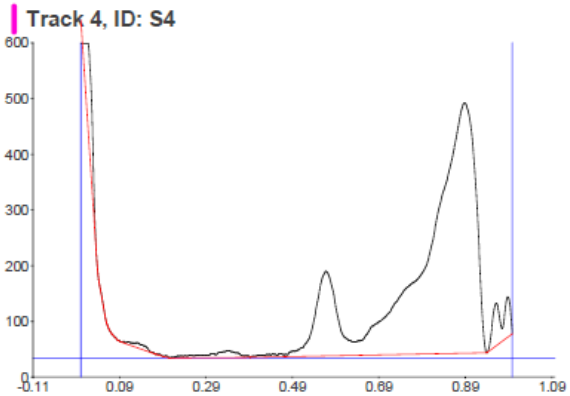
AutoGenerated2 @ 254 nm
AutoGenerate
AutoGenerated3 @ 25
AutoGenerated14 @ 25

4. Data hasil TLC-*Scanner* ekstrak etanol 96% metode digesti dengan rasio pelarut 1:30 dan metode maserasi pada UV 366.

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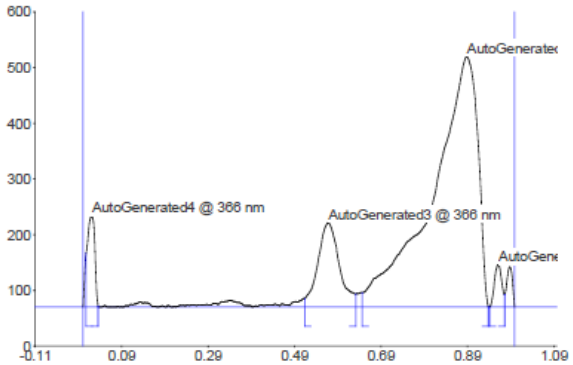
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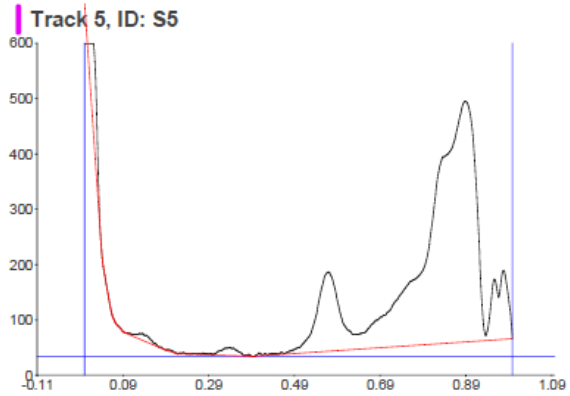
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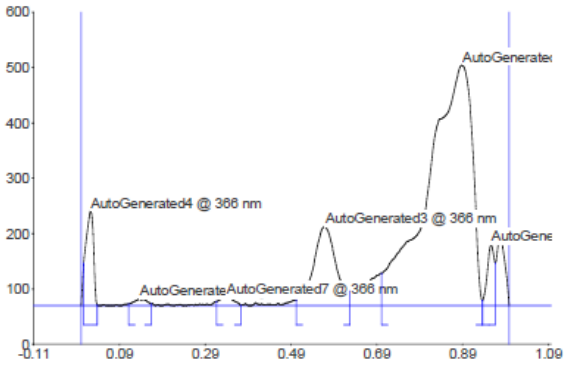
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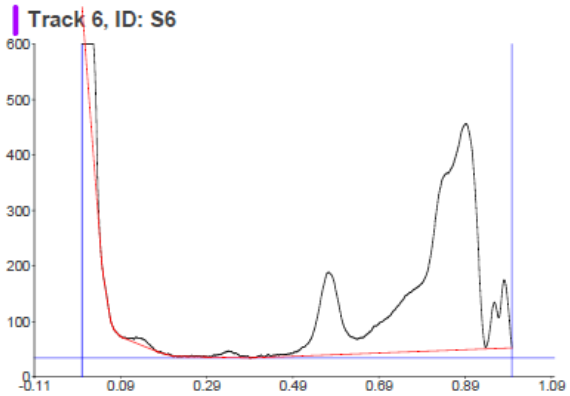
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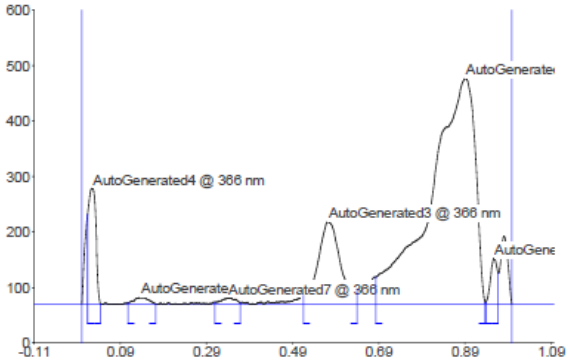
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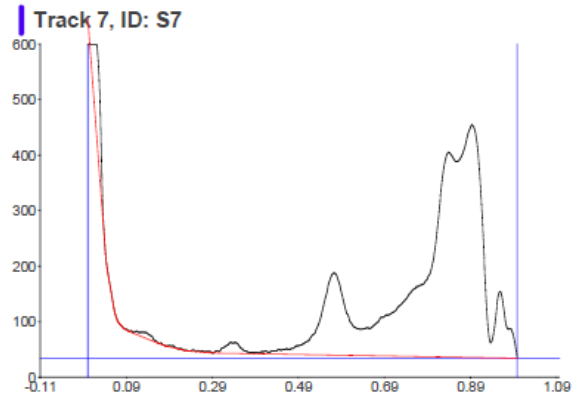
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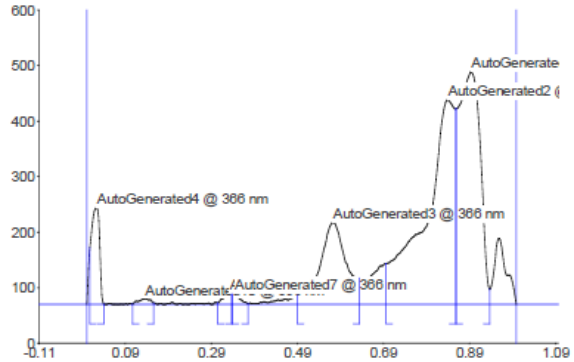
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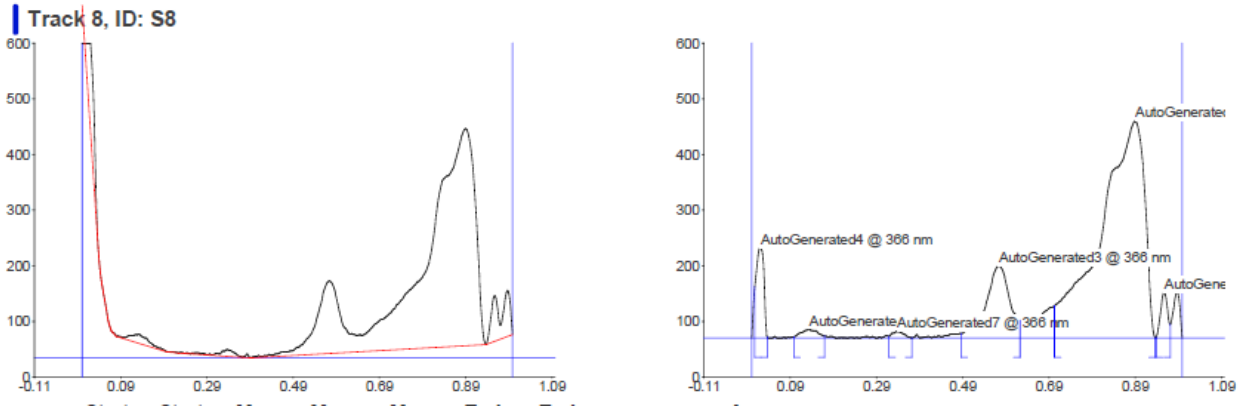
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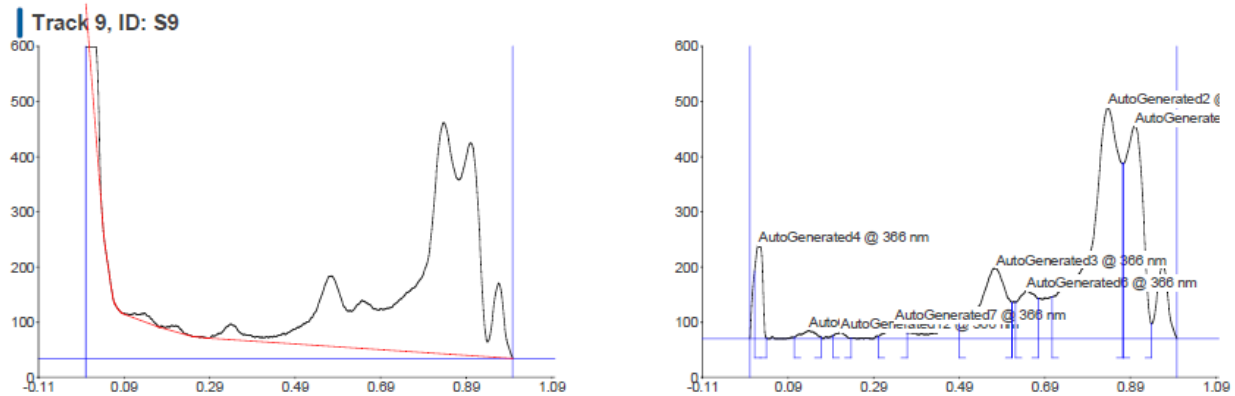
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AutoGenerate
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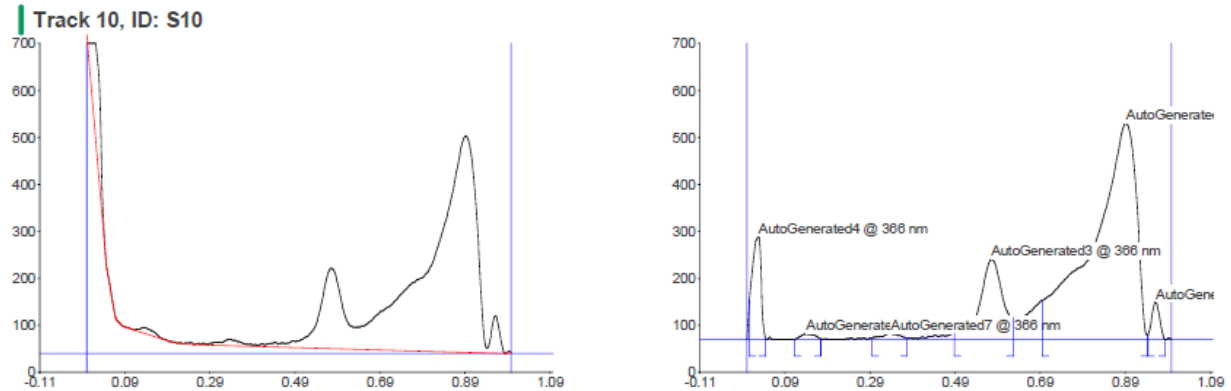
AutoGenerated6 @ 366 nm
AutoGenerated7 @ 366 nm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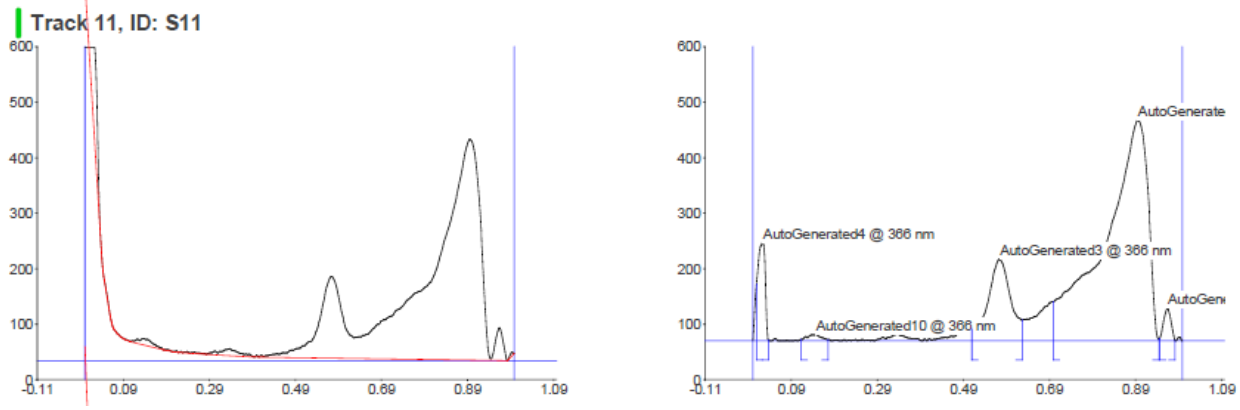
Track 11, ID: S11
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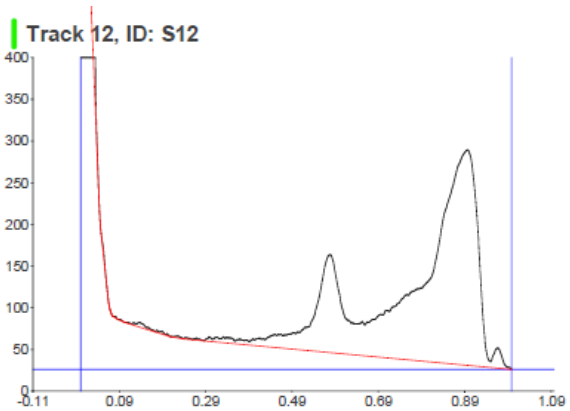
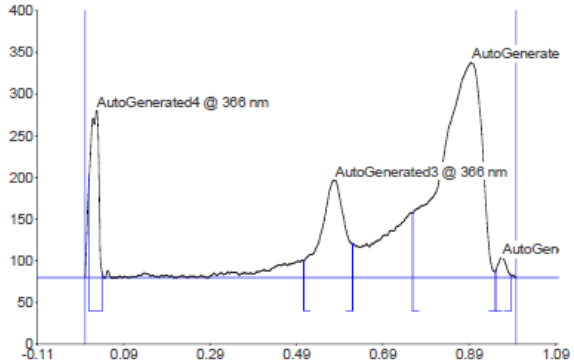

Track 12, ID: S12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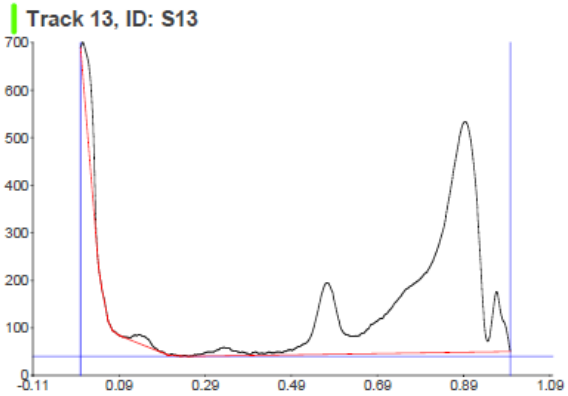
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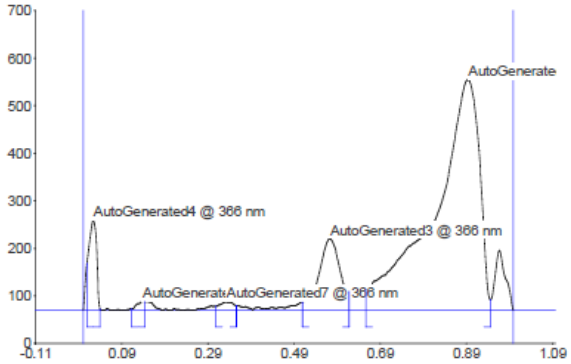
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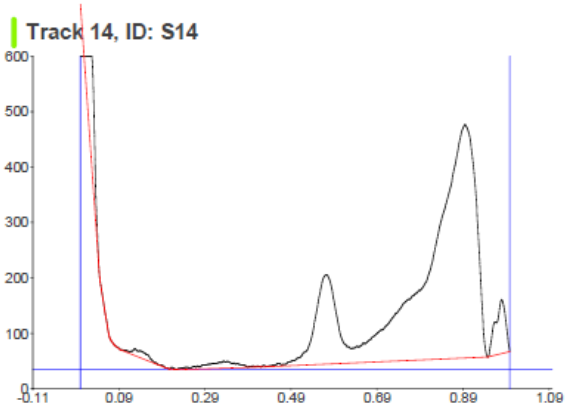
AutoGenerat AutoGenerated7 @ 366 nm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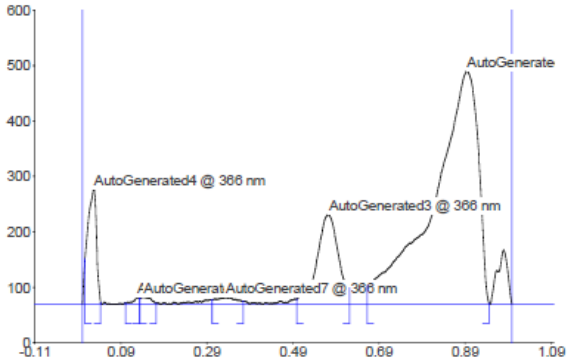
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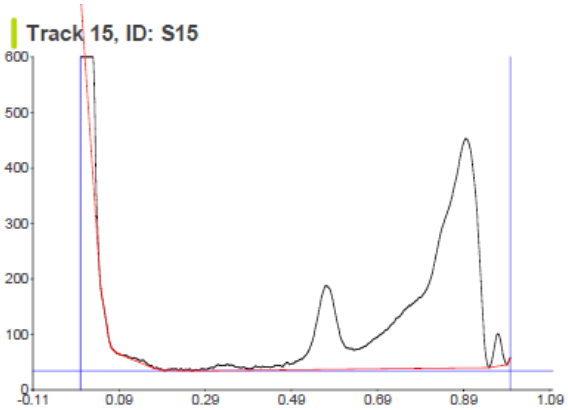
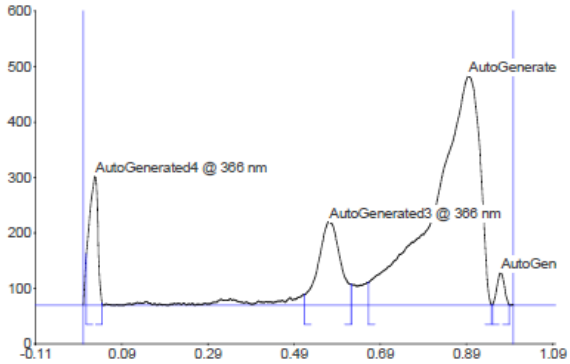

Track 15, ID: S15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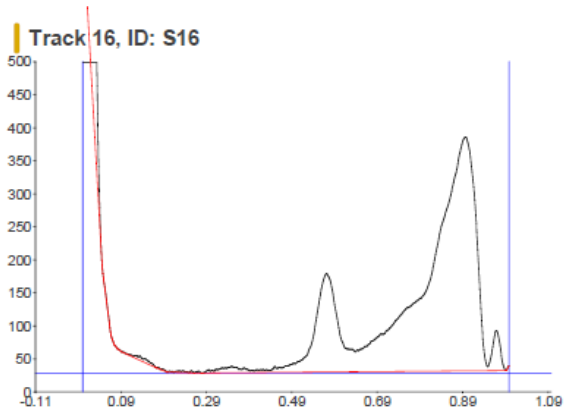
Track 16, ID: S16
500
450
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300
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200
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-0.11
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0.49
0.69
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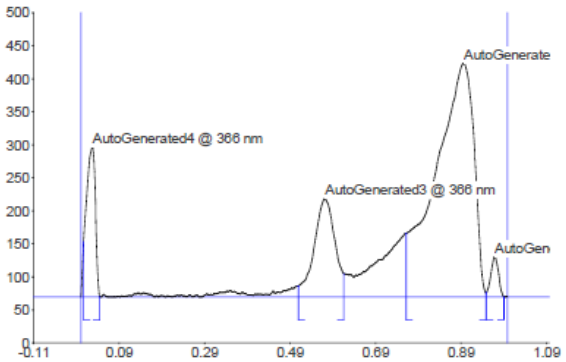
AutoGenerate
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AutoGenerated3 @ 366 nm
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500
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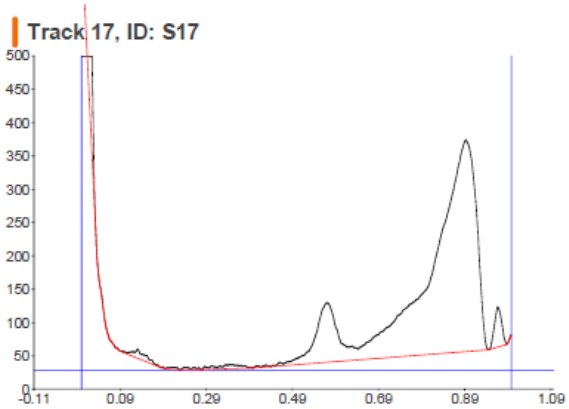
0.29
0.49
0.69
0.89
1.09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0.29
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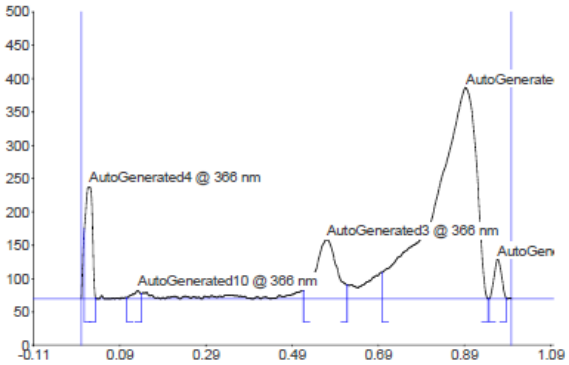
1.09


AutoGenerate
AutoGenerated4 @ 366 nm
AutoGenerated3 @ 366 nm
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AutoGenerated10 @ 366 nm
500
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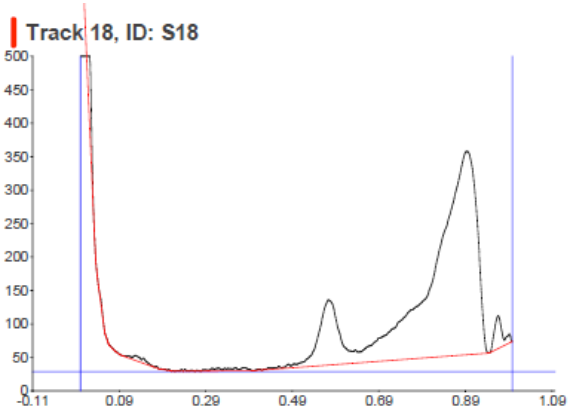
0.49
0.69
0.89
1.09


Track 18, ID: S18
500
450
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300
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200
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100
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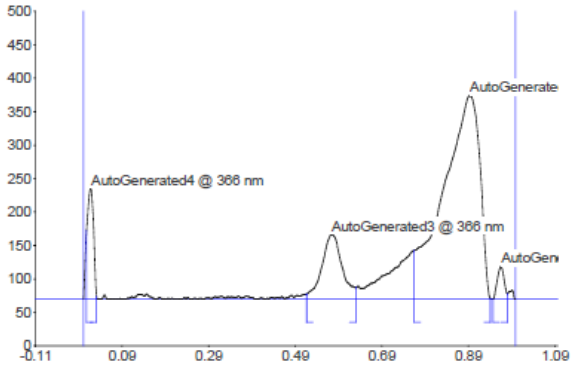
-0.11
0.09
0.29
0.49
0.69
0.89
1.09


AutoGenerate
AutoGenerated4 @ 366 nm
AutoGenerated3 @ 366 nm
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0.49
0.69
0.89
1.09

Lampiran 4. Data Hasil Spektrofotometri UV-Vis Hasil Optimasi

1. Tabel hasil absorbansi kurva baku.

	Sample ID	Type	Ex	Conc (µg/mL)	WL 439,5	Wgt. Factor
1.	Blanko	Standard		0,00	-0,000	1,000
2.	Kuarsetin 1	Standard		2,000	0,142	1,000
3.	Kuarsetin 2	Standard		4,000	0,307	1,000
4.	Kuarsetin 3	Standard		6,000	0,437	1,000
5.	Kuarsetin 4	Standard		8,000	0,622	1,000
6.	Kuarsetin 5	Standard		10,000	0,710	1,000

2. Tabel hasil absorbansi sampel uji.

	Sample ID	Type	Ex	Conc (µg/mL)	WL 439,5
1.	Blanko	Unknown		0,00	-0,057
2.	A91	Unknown		2,067	0,158
3.	A92	Unknown		2,153	0,184
4.	X91	Unknown		2,122	0,173
5.	X92	Unknown		2,075	0,161
6.	C91	Unknown		2,023	0,145
7.	C92	Unknown		2,037	0,151
8.	D61	Unknown		2,253	0,187
9.	D62	Unknown		2,315	0,193

Lampiran 5. Perhitungan

1. Susut Pengeringan.

Susut Pengeringan = $\frac{bobot\ awal\ simplisia\ (g) - bobot\ akhir\ simplisia\ (g)}{bobot\ awal\ simplisia\ (g)}$ x 100%

= $\frac{1,0002 - 0,99979}{1,0002}$ x 100%

= 0,239 %

2. Rendemen hasil ekstraksi dengan metode digesti menggunakan pelarut etanol 96% dengan rasio pelarut 1:10.

a. Rasio simplisia dan pelarut 1:10, waktu ekstraksi 1 jam dengan suhu 40°C

Rendemen (%) = $\frac{Berat\ ekstrak\ (g)}{Berat\ simplisia\ (g)}\ X\ 100\%$

= $\frac{0,82}{10}\ X\ 100\%$

= 8,2 %

b. Rasio simplisia dan pelarut 1:10, waktu ekstraksi 1 jam dengan suhu 50°C

Rendemen (%) = $\frac{Berat\ ekstrak\ (g)}{Berat\ simplisia\ (g)}\ X\ 100\%$

= $\frac{0,55}{10}\ X\ 100\%$

= 5,5 %

C. Rasio simplisia dan pelarut 1:10, waktu ekstraksi 1 jam dengan suhu 60°C

Rendemen (%) = $\frac{Berat\ ekstrak\ (g)}{Berat\ simplisia\ (g)}\ X\ 100\%$

= $\frac{0,74}{10}\ X\ 100\%$

= 7,4 %

d. Rasio simplisia dan pelarut 1:10, waktu ekstraksi 3 jam dengan suhu 40°C

Rendemen (%) = $\frac{Berat\ ekstrak\ (g)}{Berat\ simplisia\ (g)}\ X\ 100\%$

= $\frac{0,64}{10}\ X\ 100\%$

= 6,4 %

e. Rasio simplisia dan pelarut 1:10, waktu ekstraksi 3 jam dengan suhu 50°C

Rendemen (%) = $\frac{Berat\ ekstrak\ (g)}{Berat\ simplisia\ (g)}\ X\ 100\%$

= $\frac{0,7}{10}\ X\ 100\%$

= 7 %

f. Rasio simplisia dan pelarut 1:10, waktu ekstraksi 3 jam dengan suhu 60°C

Rendemen (%) = $\frac{Berat\ ekstrak\ (g)}{Berat\ simplisia\ (g)}\ X\ 100\%$

= $\frac{0,83}{10}\ X\ 100\%$

= 8,3 %

g. Rasio simplisia dan pelarut 1:10, waktu ekstraksi 6 jam dengan suhu 40°C

Rendemen (%) = $\frac{Berat\ ekstrak\ (g)}{Berat\ simplisia\ (g)}\ X\ 100\%$

= $\frac{0,74}{10}\ X\ 100\%$

= 7,4 %

h. Rasio simplisia dan pelarut 1:10, waktu ekstraksi 6 jam dengan suhu 50°C

Rendemen (%) = $\frac{Berat\ ekstrak\ (g)}{Berat\ simplisia\ (g)}\ X\ 100\%$

= $\frac{0,78}{10}\ X\ 100\%$

= 7,8 %

i. Rasio simplisia dan pelarut 1:10, waktu ekstraksi 6 jam dengan suhu 60°C

Rendemen (%) = $\frac{Berat\ ekstrak\ (g)}{Berat\ simplisia\ (g)}\ X\ 100\%$

= $\frac{0,79}{10}\ X\ 100\%$

= 7,9 %

3. Rendemen hasil ekstraksi dengan metode digesti menggunakan pelarut etanol 96% dengan rasio pelarut 1:20.

a. Rasio simplisia dan pelarut 1:20, waktu ekstraksi 1 jam dengan suhu 40°C

Rendemen (%) = $\frac{Berat\ ekstrak\ (g)}{Berat\ simplisia\ (g)}\ X\ 100\%$

= $\frac{0,76}{10}\ X\ 100\%$

= 7,6 %

b. Rasio simplisia dan pelarut 1:20, waktu ekstraksi 1 jam dengan suhu 50°C

Rendemen (%) = $\frac{Berat\ ekstrak\ (g)}{Berat\ simplisia\ (g)}\ X\ 100\%$

= $\frac{0,8}{10}\ X\ 100\%$

= 8 %

C. Rasio simplisia dan pelarut 1:20, waktu ekstraksi 1 jam dengan suhu 60°C

Rendemen (%) = $\frac{Berat\ ekstrak\ (g)}{Berat\ simplisia\ (g)}\ X\ 100\%$

= $\frac{0,81}{10}\ X\ 100\%$

= 8,1 %

d. Rasio simplisia dan pelarut 1:20, waktu ekstraksi 3 jam dengan suhu 40°C

Rendemen (%) = $\frac{Berat\ ekstrak\ (g)}{Berat\ simplisia\ (g)}\ X\ 100\%$

= $\frac{0,75}{10}\ X\ 100\%$

= 7,5 %

e. Rasio simplisia dan pelarut 1:20, waktu ekstraksi 3 jam dengan suhu 50°C

Rendemen (%) = $\frac{Berat\ ekstrak\ (g)}{Berat\ simplisia\ (g)}\ X\ 100\%$

= $\frac{0,83}{10}\ X\ 100\%$

= 8,3 %

f. Rasio simplisia dan pelarut 1:20, waktu ekstraksi 3 jam dengan suhu 60°C

Rendemen (%) = $\frac{Berat\ ekstrak\ (g)}{Berat\ simplisia\ (g)}\ X\ 100\%$

= $\frac{0,94}{10}\ X\ 100\%$

= 9,4 %

g. Rasio simplisia dan pelarut 1:20, waktu ekstraksi 6 jam dengan suhu 40°C

Rendemen (%) = $\frac{Berat\ ekstrak\ (g)}{Berat\ simplisia\ (g)}\ X\ 100\%$

= $\frac{0,82}{10}\ X\ 100\%$

= 8,2 %

h. Rasio simplisia dan pelarut 1:20, waktu ekstraksi 6 jam dengan suhu 50°C

Rendemen (%) = $\frac{Berat\ ekstrak\ (g)}{Berat\ simplisia\ (g)}\ X\ 100\%$

= $\frac{0,95}{10}\ X\ 100\%$

= 9,5 %

i. Rasio simplisia dan pelarut 1:20, waktu ekstraksi 6 jam dengan suhu 60°C

Rendemen (%) = $\frac{Berat\ ekstrak\ (g)}{Berat\ simplisia\ (g)}\ X\ 100\%$

= $\frac{1,01}{10}\ X\ 100\%$

= 10,1 %

4. Rendemen hasil ekstraksi dengan metode digesti menggunakan

pelarut etanol 96% dengan rasio pelarut 1:30.

a. Rasio simplisia dan pelarut 1:30, waktu ekstraksi 1 jam dengan suhu 40°C

Rendemen (%) = $\frac{Berat\ ekstrak\ (g)}{Berat\ simplisia\ (g)}\ X\ 100\%$

= $\frac{0,84}{10}\ X\ 100\%$

= 8,4 %

b. Rasio simplisia dan pelarut 1:30, waktu ekstraksi 1 jam dengan suhu 50°C

Rendemen (%) = $\frac{Berat\ ekstrak\ (g)}{Berat\ simplisia\ (g)}\ X\ 100\%$

= $\frac{0,71}{10}\ X\ 100\%$

= 7,1 %

C. Rasio simplisia dan pelarut 1:30, waktu ekstraksi 1 jam dengan suhu 60°C

Rendemen (%) = $\frac{Berat\ ekstrak\ (g)}{Berat\ simplisia\ (g)}\ X\ 100\%$

= $\frac{0,99}{10}\ X\ 100\%$

= 9,9 %

d. Rasio simplisia dan pelarut 1:30, waktu ekstraksi 3 jam dengan suhu 40°C

Rendemen (%) = $\frac{Berat\ ekstrak\ (g)}{Berat\ simplisia\ (g)}\ X\ 100\%$

= $\frac{0,8}{10}\ X\ 100\%$

= 8 %

e. Rasio simplisia dan pelarut 1:30, waktu ekstraksi 3 jam dengan suhu 50°C

Rendemen (%) = $\frac{Berat\ ekstrak\ (g)}{Berat\ simplisia\ (g)}\ X\ 100\%$

= $\frac{0,94}{10}\ X\ 100\%$

= 9,4 %

f. Rasio simplisia dan pelarut 1:30, waktu ekstraksi 3 jam dengan suhu 60°C

Rendemen (%) = $\frac{Berat\ ekstrak\ (g)}{Berat\ simplisia\ (g)}\ X\ 100\%$

= $\frac{0,98}{10}\ X\ 100\%$

= 9,8 %

g. Rasio simplisia dan pelarut 1:30, waktu ekstraksi 6 jam dengan suhu 40°C

Rendemen (%) = $\frac{Berat\ ekstrak\ (g)}{Berat\ simplisia\ (g)}\ X\ 100\%$

= $\frac{0,85}{10}\ X\ 100\%$

= 8,5 %

h. Rasio simplisia dan pelarut 1:30, waktu ekstraksi 6 jam dengan suhu 50°C

Rendemen (%) = $\frac{Berat\ ekstrak\ (g)}{Berat\ simplisia\ (g)}\ X\ 100\%$

= $\frac{1,01}{10}\ X\ 100\%$

= 10,1 %

i. Rasio simplisia dan pelarut 1:30, waktu ekstraksi 6 jam dengan suhu 60°C

Rendemen (%) = $\frac{Berat\ ekstrak\ (g)}{Berat\ simplisia\ (g)}\ X\ 100\%$

= $\frac{1,06}{10}\ X\ 100\%$

= 10,6 %

5. Rendemen hasil ekstraksi dengan metode maserasi menggunakan pelarut etanol 96%

a. Rasio simplisia dan pelarut 1:10 dengan waktu 24 jam

Rendemen (%) = $\frac{Berat\ ekstrak\ (g)}{Berat\ simplisia\ (g)}\ X\ 100\%$

= $\frac{0,86}{10}\ X\ 100\%$

= 8,6 %

b. Rasio simplisia dan pelarut 1:20 dengan waktu 24 jam

Rendemen (%) = $\frac{Berat\ ekstrak\ (g)}{Berat\ simplisia\ (g)}\ X\ 100\%$

= $\frac{0,94}{10}\ X\ 100\%$

= 9,4 %

C. Rasio simplisia dan pelarut 1:30 dengan waktu 24 jam

Rendemen (%) = $\frac{Berat\ ekstrak\ (g)}{Berat\ simplisia\ (g)}\ X\ 100\%$

= $\frac{1,01}{10}\ X\ 100\%$

= 10,1 %

d. Rasio simplisia dan pelarut 1:10 dengan waktu 48 jam

Rendemen (%) = $\frac{Berat\ ekstrak\ (g)}{Berat\ simplisia\ (g)}\ X\ 100\%$

$= \frac{0,86}{10} X\ 100\%$

= 8,6 %

e. Rasio simplisia dan pelarut 1:20 dengan waktu 48 jam

Rendemen (%) = $\frac{Berat\ ekstrak\ (g)}{Berat\ simplisia\ (g)} X\ 100\%$

$= \frac{1}{10} X\ 100\%$

= 10 %

f. Rasio simplisia dan pelarut 1:30 dengan waktu 48 jam

Rendemen (%) = $\frac{Berat\ ekstrak\ (g)}{Berat\ simplisia\ (g)} X\ 100\%$

$= \frac{1,68}{10} X\ 100\%$

= 16,8 %

g. Rasio simplisia dan pelarut 1:10 dengan waktu 72 jam

Rendemen (%) = $\frac{Berat\ ekstrak\ (g)}{Berat\ simplisia\ (g)} X\ 100\%$

$= \frac{0,89}{10} X\ 100\%$

= 8,9 %

h. Rasio simplisia dan pelarut 1:20 dengan waktu 72 jam

Rendemen (%) = $\frac{Berat\ ekstrak\ (g)}{Berat\ simplisia\ (g)} X\ 100\%$

$= \frac{1,05}{10} X\ 100\%$

= 10,5 %

i. Rasio simplisia dan pelarut 1:30 dengan waktu 72 jam

Rendemen (%) = $\frac{Berat\ ekstrak\ (g)}{Berat\ simplisia\ (g)} X\ 100\%$

$= \frac{1,03}{10} X\ 100\%$

= 10,3 %

6. Kadar Flavonoid Total Spektrofotometri UV-Vis Hasil Optimasi

Persamaan: y = 0,073x + 0,003

Keterangan:

y = serapan

x = konsentrasi

a. Ekstrak etanol 96% dengan rasio simplisia dan pelarut 1:30 pada waktu 6 jam dengan suhu 60°C pada replikasi I diperoleh serapan 0,145

Sehingga, untuk mendapatkan konsentrasi:

0,145 = 0,073x + 0,003

x = $\frac{0,145-0,003}{0,073}$

x = 1,945 µg/mL

Kadar flavonoid = $\frac{x.v.fp}{g}$

$= \frac{1,945.0,005.2,5}{0,01}$

= 2,431 µg/mg

b. Ekstrak etanol 96% dengan rasio simplisia dan pelarut 1:30 pada waktu 6 jam dengan suhu 60°C pada replikasi II diperoleh serapan 0,151

Sehingga, untuk mendapatkan konsentrasi:

0,151 = 0,073x + 0,003

x = $\frac{0,151-0,003}{0,073}$

x = 2,027 µg/mL

Kadar flavonoid $= \frac{x.v.fp}{g}$

$= \frac{2,027\ .0,005.2,5}{0,01}$

= 2.534 µg/mg

c. Ekstrak etanol 96% dengan rasio simplisia dan pelarut 1:30 pada waktu 48 jam dengan maserasi suhu ruang pada replikasi I diperoleh serapan 0,187

Sehingga, untuk mendapatkan konsentrasi:

0,187 = 0,073x + 0,003

x = $\frac{0,187-0,003}{0,073}$

x = 2,520 µg/mL

Kadar flavonoid $= \frac{x.v.fp}{g}$

$= \frac{2,520.0,005.2,5}{0,01}$

= 3,150 µg/mg

d. Ekstrak etanol 96% dengan rasio simplisia dan pelarut 1:30 pada waktu 48 jam dengan maserasi suhu ruang pada replikasi II diperoleh serapan 0,193

Sehingga, untuk mendapatkan konsentrasi:

0,193 = 0,073x + 0,003

x = $\frac{0,193-0,003}{0,073}$

x = 2,602 µg/mL

Kadar flavonoid $= \frac{x.v.fp}{g}$

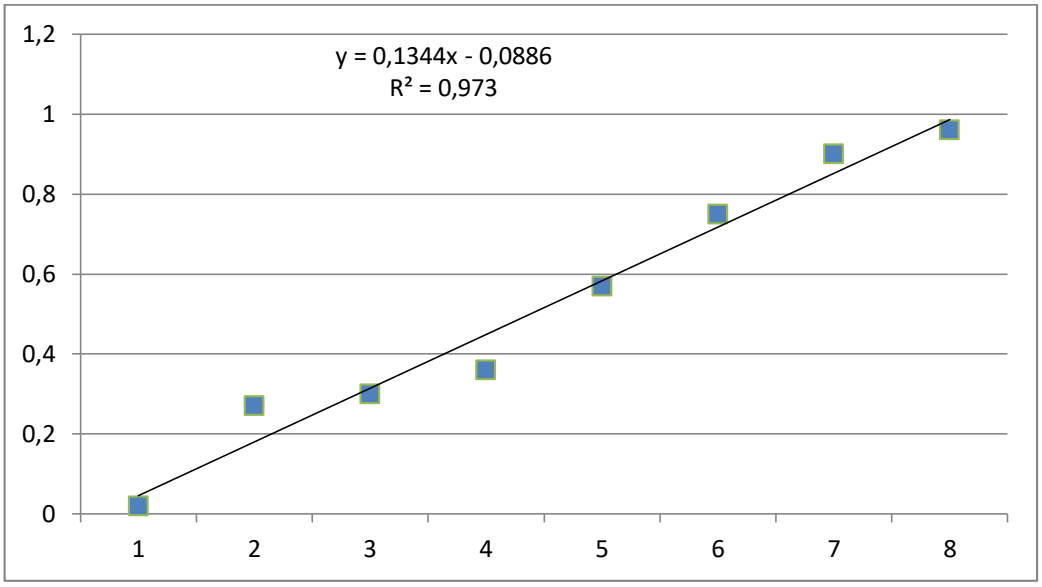
$= \frac{2,602.0,005.2,5}{0,01}$

= 3,253 µg/mg.

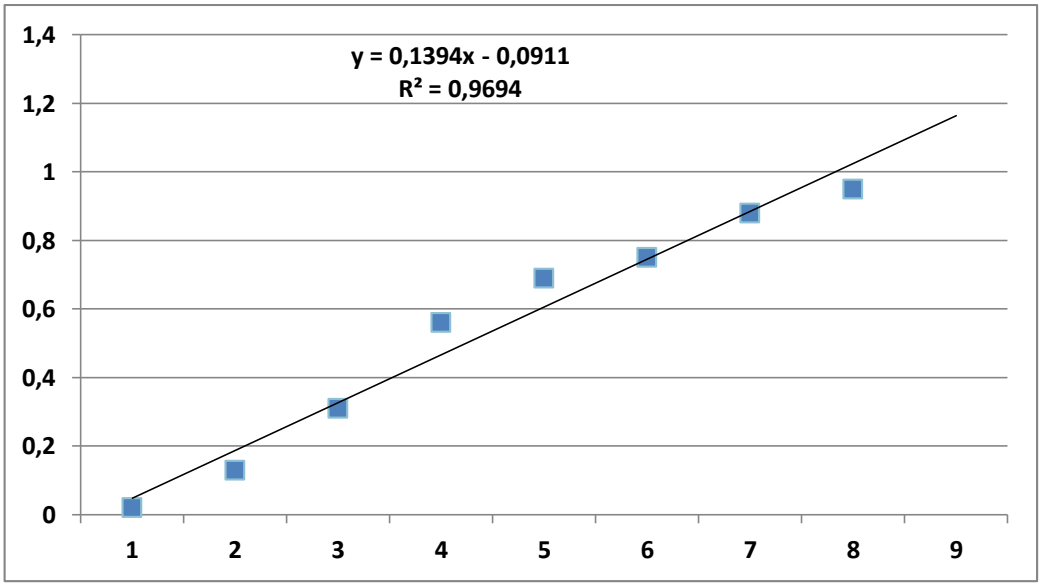
Lampiran 6. Grafik Analisis Koefisien Korelasi *Cluster* pada PCA *Scores*

1. Rasio 1:10

a. *Cluster* A

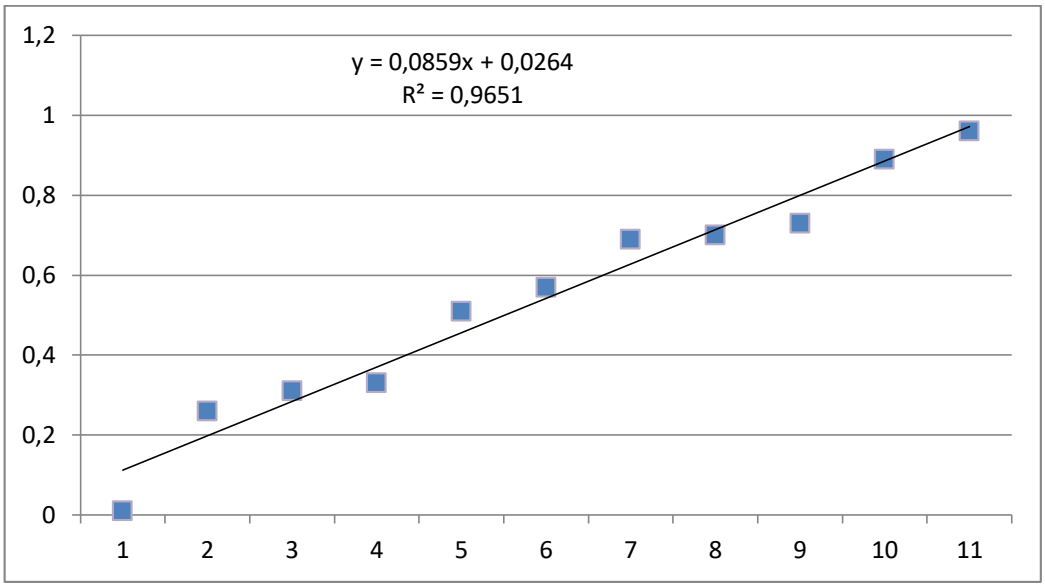


b. *Cluster* B

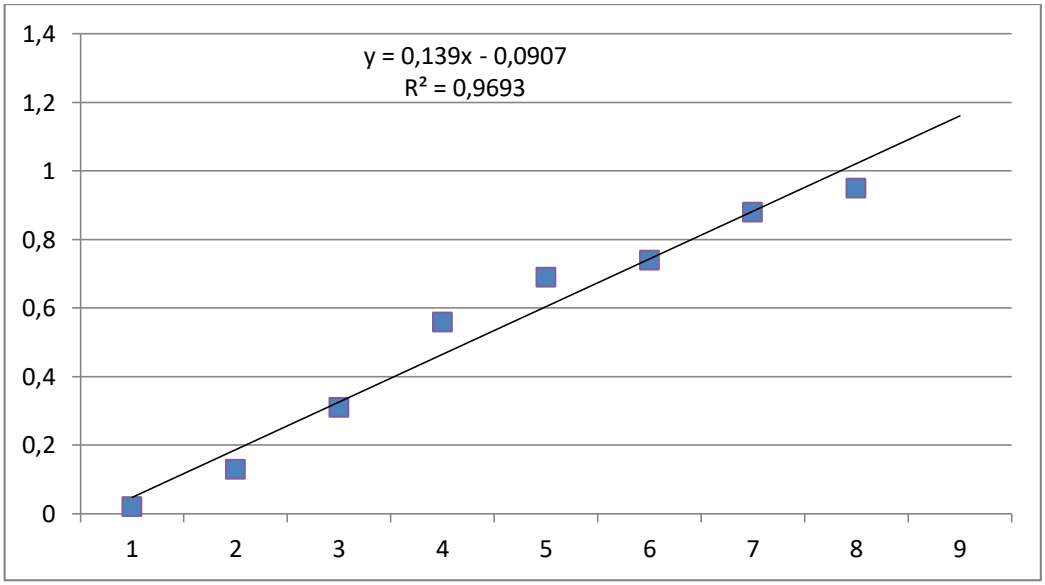


2. Rasio pelarut 1:20

a. *Cluster* A

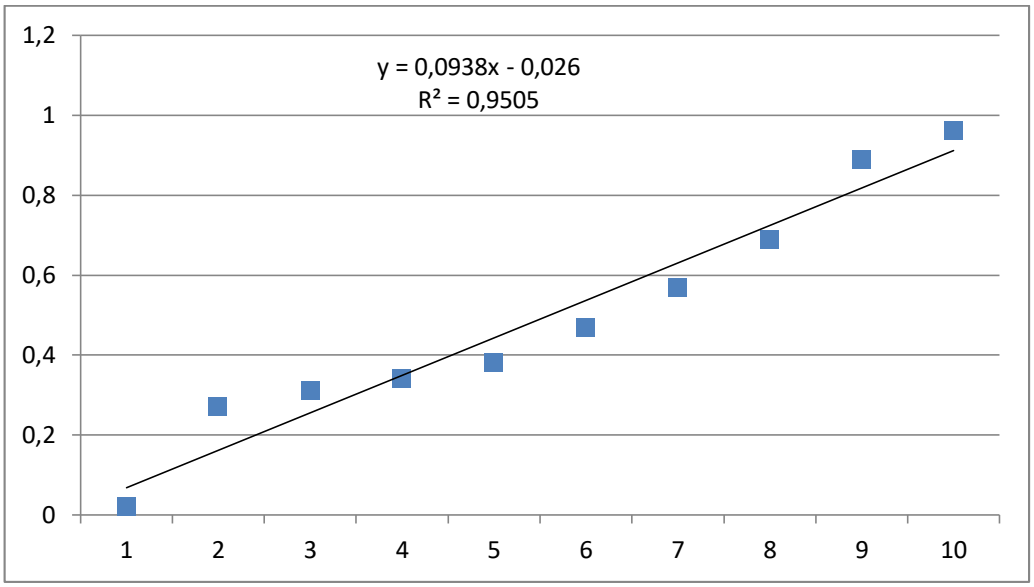


b. *Cluster* B

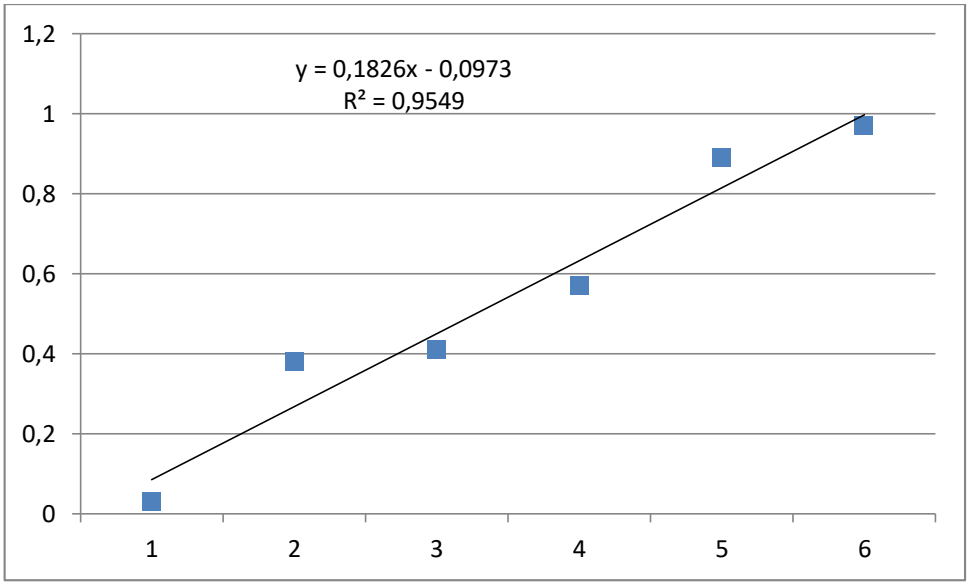


3. Rasio pelarut 1:30

a. *Cluster* A.



b. *Cluster* B.



C. *Cluster* C.