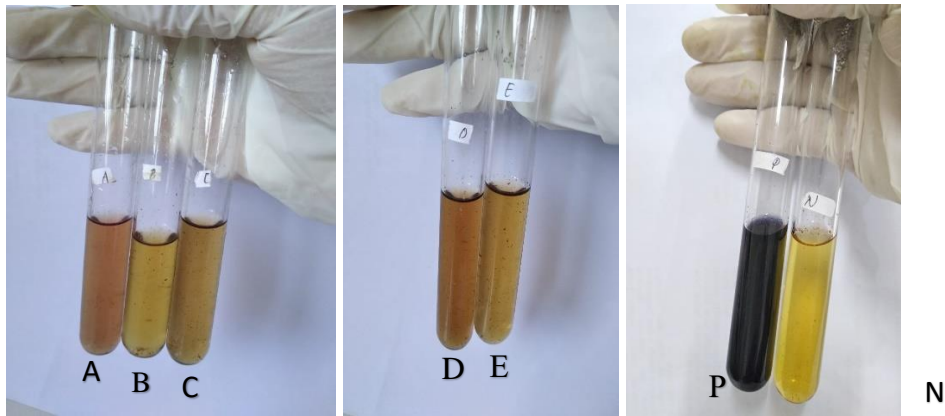


LAMPIRAN

Lampiran 1. Hasil dan perhitungan pada sampel



Gambar 4.1. Hasil Perubahan Warna Uji Kualitatif (a) Positif, (b) Negatif, (c) Negatif, (d) Negatif, (e) Negatif, (p) Kontrol positif, dan (N) Kontrol negatif.

1. Operating Time

Waktu (Menit)	Absorbansi	Waktu (Menit)	Absorbansi
1	0,798	31	0,792
2	0,798	32	0,793
3	0,798	33	0,793
4	0,798	34	0,794
5	0,799	35	0,794
6	0,799	36	0,794
7	0,799	37	0,794
8	0,799	38	0,795
9	0,799	39	0,795
10	0,799	40	0,796
11	0,799	41	0,796
12	0,799	42	0,796
13	0,799	43	0,796
14	0,799	44	0,796
15	0,799	45	0,796
16	0,798	46	0,796
17	0,798	47	0,796
18	0,798	48	0,796
19	0,798	49	0,796
20	0,798	50	0,797
21	0,798	51	0,797
22	0,798	52	0,797
23	0,798	53	0,797
24	0,798	54	0,797
25	0,798	55	0,797
26	0,798	56	0,797

27	0,798	57	0,798
28	0,798	58	0,798
29	0,798	59	0,798
30	0,798	60	0,798

2. Penetapan kadar formalin pada sampel

Sampel	Absorbansi	Kadar (mg/kg)
A 1	0,446	43,1 mg/kg
A 2	0,443	40,63 mg/kg
A 3	0,444	42,82 mg/kg
Rata-rata		42,183 mg/kg

Perhitungan penetapan kadar

Persamaan regresi linier $y = 0,0504x + 0,2282$

Rumus penetapan kadar $\frac{C \times Vol.pem}{penimbangan}$

1. A1 0,446

$$\begin{aligned}
 0,446 &= 0,0504x + 0,2282 \\
 &= \frac{0,446 - 0,2282}{0,0504} \\
 x &= \frac{0,2178}{0,0504} = 4,321 \text{ ppm} \\
 \text{kadar} &= \frac{4,321 \frac{\text{mg}}{\text{L}} \times 0,1 \text{ L}}{0,01 \text{ kg}} \\
 &= \frac{0,431}{0,01 \text{ kg}} = 43,1 \text{ mg/kg}
 \end{aligned}$$

2. A2 0,433

$$\begin{aligned}
 0,433 &= 0,0504x + 0,2282 \\
 &= \frac{0,433 - 0,2282}{0,0504} \\
 x &= 4,063 \text{ ppm} \\
 \text{kadar} &= \frac{4,063 \frac{\text{mg}}{\text{L}} \times 0,1 \text{ L}}{0,01 \text{ kg}} \\
 &= \frac{0,4063 \text{ mg}}{0,01 \text{ kg}} = 40,63 \text{ mg/kg}
 \end{aligned}$$

3. A3 0,444

$$0,444 = 0,0504x + 0,2282$$

$$= \frac{0,444 - 0,2282}{0,0504}$$

$$X = 4,282 \text{ ppm}$$

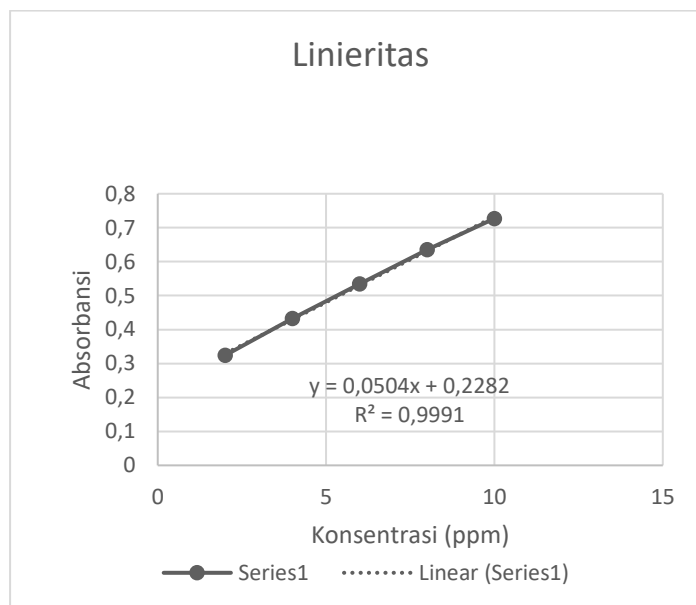
$$\text{Kadar} = \frac{4,282 \frac{\text{mg}}{\text{L}} \times 0,1 \text{ L}}{0,01 \text{ kg}}$$

$$= \frac{0,4282 \text{ mg}}{0,01 \text{ kg}} = 42,82 \text{ mg/kg}$$

Validasi metode

a. Linieritas

Konsentrasi (ppm)	Absorbansi
2	0,324
4	0,433
6	0,534
8	0,635
10	0,727



b. LOD dan LOQ

Konsentrasi (C)	Abs (Y)	Yi	Y-Yi	(Y-Yi)
2 ppm	0,324	0,329	-0,005	0,000025
4 ppm	0,433	0,430	0,003	0,000009
6 ppm	0,534	0,531	0,003	0,000009
8 ppm	0,635	0,631	0,004	0,000016

10 ppm	0,727	0,732	-0,005	0,000025
Jumlah				0,000084

Perhitungan LOD dan LOQ

$$S(y/x) = \sum \frac{(y-y_i)^2}{N-2}$$

$$S(y/x) = \frac{0,000084}{5-2}$$

$$= 0,0000168$$

$$S(y/x) = \sqrt{0,0000168}$$

$$= 0,0041$$

- LOD

$$S(y/x) = \frac{3.SD(\frac{y}{x})}{slope}$$

$$= \frac{3.0,004}{0,0504}$$

$$= 0,244 \text{ ppm}$$

Maka konsentrasi yang dapat terdeteksi yaitu 0,244 ppm.

- LOQ

$$S(y/x) = \frac{10.SD(\frac{y}{x})}{slope}$$

$$= \frac{10.0,0041}{0.0504}$$

$$= 0,813 \text{ ppm}$$

Maka batas dari kuantitasi yang dapat terdeteksi yaitu 0,813 ppm.

c. Presisi

Sampel	Absorbansi
Presisi 1	0,431
Presisi 2	0,436
Presisi 3	0,436
Presisi 4	4,439
Presisi 5	0,431
Presisi 6	0,434
Jumlah	2,607

Rata-rata	0,4345
SD	0,00315
% RSD	0,723%

$$= \frac{0,431+0,436+0,436+0,439+0,431+0,434}{6}$$

$$= 0,435$$

$$\text{Standar Deviasi} = \sqrt{0,003}$$

$$\%RSD = 0,00723502 \times 100\%$$

$$= 0,723\%$$

d. Akurasi

Sampel	Absorbansi	% Recovery	X %Recovery
4 ppm 1	0,435	102,675%	101,482%
4 ppm 2	0,437	103,675%	
4 ppm 3	0,434	102,075%	
6 ppm 1	0,536	101,783%	
6 ppm 2	0,537	102,083%	
6 ppm 3	0,531	100,2%	
8 ppm 1	0,633	100,45%	
8 ppm 2	0,633	100,45%	
8 ppm 3	0,631	99,95%	

Persamaan regresi linier $y = bx+a$

$$y = 0,504x+0,2282$$

Perhitungan % Recovery

1.

4ppm 1. $y = 0,435$

$$0,435 = 0,0504x+0,228$$

$$x = 0,435-0,228/0,0504$$

$$= 4,107 \text{ ppm}$$

$$\%Recovery = \frac{\text{kadar terukur/kadar sebenarnya} \times 100\%}{4}$$

$$= 4,107 \text{ ppm}/4 \times 100\%$$

$$102,68\%$$

$$2. y = 0,437 \quad 0,437 = 0,0504x + 0,228$$

$$x = 0,437 - 0,228 / 0,0504$$

$$= 4,147 \text{ ppm}$$

$$\% \text{Recovery} = 4,147 / 4 \times 100\%$$

$$103,68\%$$

$$3. y = 0,434$$

$$0,434 = 0,0504x + 0,2282$$

$$x = 0,434 - 0,228 / 0,0504$$

$$= 4,083 \text{ ppm}$$

$$\% \text{Recovery} = 4,083 / 4 \times 100\%$$

$$102,08\%$$

2. 6 ppm

$$1. y = 0,536$$

$$0,536 = 0,0504x + 0,228$$

$$x = 6,107$$

$$\% \text{Recovery} = 6,107 / 6 \times 100\%$$

$$101,78\%$$

$$2. y = 0,537$$

$$0,537 = 0,0504x + 0,2282$$

$$x = 6,126 \text{ ppm}$$

$$\% \text{Recovery} = 6,126 \text{ ppm} / 6 \times 100\%$$

$$102,08\%$$

$$3 y = 0,531$$

$$0,531 = 0,0504x + 0,2282$$

$$x = 6,012 \text{ ppm}$$

$$\% \text{Recovery} = 6,012 \text{ ppm} / 6 \times 100\%$$

$$100,20\%$$

3. 8 ppm

$$1. y =$$

$$0,633$$

$$0,633 = 0,0504x + 0,2282$$

$$x = 8,036$$

$$\text{ppm}$$

$$\% \text{Recovery} = 8,036 / 8 \times 100\%$$

$$100,45\%$$

$$2. y =$$

$$0,633 \quad 0,633 = 0,0504x + 0,2282$$

$$x = 8,036 \text{ ppm}$$

$$100,45\%$$

$$\% \text{Recovery} = 8,036 / 8 \times 100\%$$

$$3. y =$$

$$0,631$$

$$0,631 = 0,0504x + 0,2282$$


$$x = 7,996$$

ppm

$$\% \text{Recovery} = 7,996 \text{ ppm} / 8 \times 100\%$$

$$99,95\%$$

Lampiran 2. Sertifikat Analisa



Certificate of Analysis

1.02498.0025 Chromotropic acid disodium salt dihydrate for analysis ACS, Reag. Ph Eur'
 Batch CN21009698

	Spec. Values	Batch Values
Appearance	greyish white to brownish white powder	greyish white to brownish white powder
Assay (acidimetric, calc. on anhydrous substance)	≥ 98.5 %	99.4 %
Identity (IR-spectrum)	passes test	passes test
Appearance of solution (5 %; water)	passes test	passes test
Water (according to Karl Fischer)	8.5 - 9.5 %	9.4 %
Sensitivity (of formaldehyde)	passes test	passes test
Sensitivity (of nitrate)	passes test	passes test

Date of release (DD.MM.YYYY) 07.10.2021
 Minimum shelf life (DD.MM.YYYY) 31.10.2026


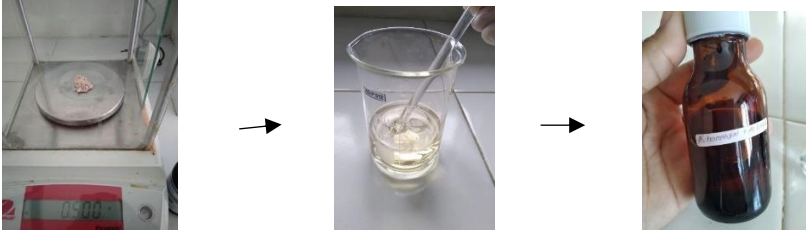
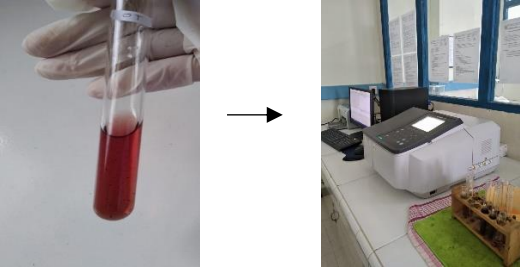
Ioannis Chartomatsidis
 Responsible laboratory manager quality control

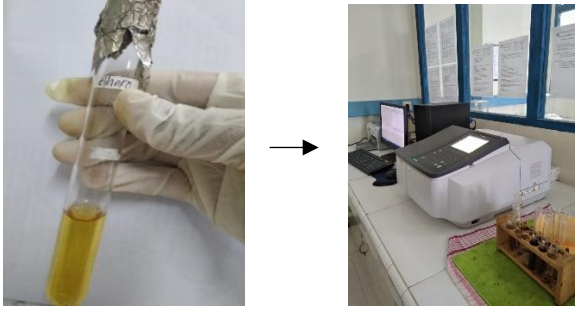

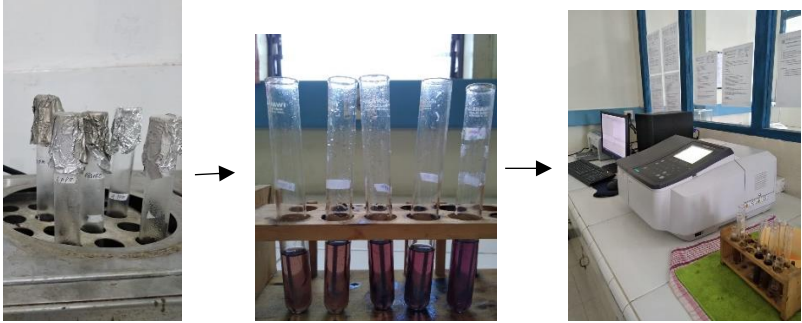
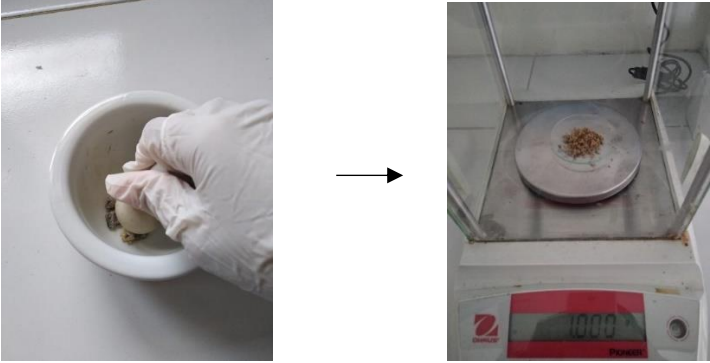
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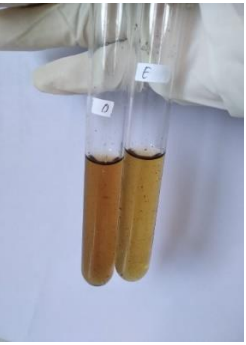
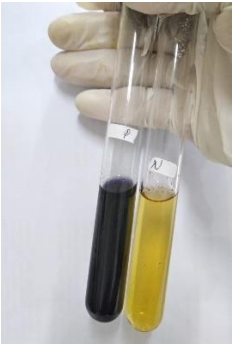
Merck KGaA, Frankfurter Straße 250, 64293 Darmstadt (Germany): +49 6151 72-0
 EMD Millipore Corporation - a subsidiary of Merck KGaA, Darmstadt, Germany
 400 Summit Drive, Burlington, MA 01803, USA, Phone +1 (781) 533-6000
 SALSA Version 1123529990000877792/ Date: 07.10.2021

Page 1 of 1

Lampiran 3. Pembuatan sampel dan uji sampel

Gambar	Keterangan
	<p>Membuat larutan induk 1000 ppm</p> <p>Membuat larutan standar 100 ppm</p> <p>Membuat larutan konsentrasi 2 ppm, 4 ppm, 6 ppm, 8 ppm, dan 10 ppm.</p>
 <p>Timbang As. Kromatofat masukkan kedalam asam sulfat 60%</p>	<p>Membuat reagen asam kromatofat</p>
 <p>Larutan yang telah dibuat, kemudian di ukur menggunakan Spektrofotometri</p>	<p>Membuat Operating time</p>

	<p>Membuat larutan blanko</p>
 <p>Dilakukan 6x pengulangan atau replikasi</p>	<p>Presisi</p>
	<p>Linieritas</p>
	<p>Membuat preparasi sampel</p>

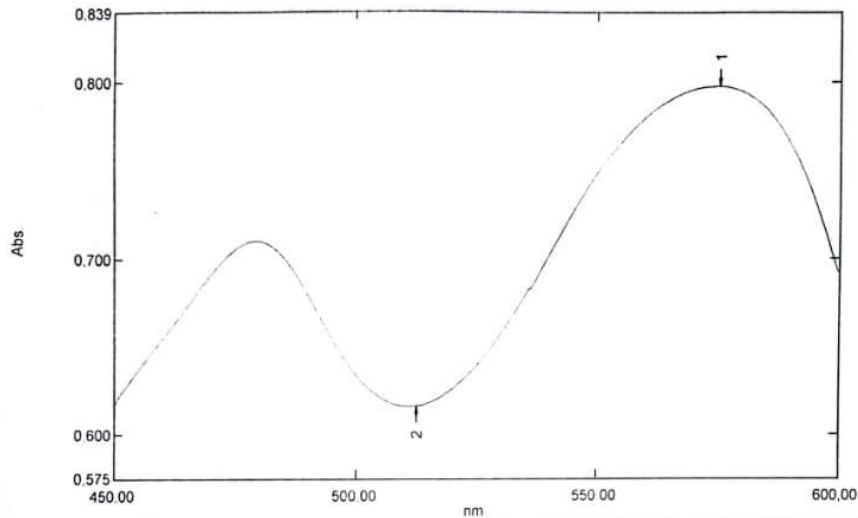
	→		
	→		<p>Membuat larutan uji kualitatif untuk penetapan kadar</p>
<p>setelah membuat larutan, lalu panaskan di waterbath</p>			
			
<p>Hasil setelah di panaskan</p>			

Lampiran 4. Hasil menggunakan Spektrofotometri UV-Vis

Spectrum Peak Pick Report

04/08/2023 14:45:14

Data Set: Panjang gel. Kontrol positif formalin - RawData



[Measurement Properties]
Wavelength Range (nm) 450.00 to 600.00
Scan Speed Fast
Sampling Interval 0.1
Auto Sampling Interval Enabled
Scan Mode Auto

No.	P/V	Wavelength	Abs.	Description
1	Ⓢ	575.20	0.798	

[Instrument Properties]
Instrument Type UV-1800 Series
Measuring Mode Absorbance
Slit Width 1.0 nm
Light Source Change Wavelength 340.0 nm
S/R Exchange Normal

[Attachment Properties]
Attachment None

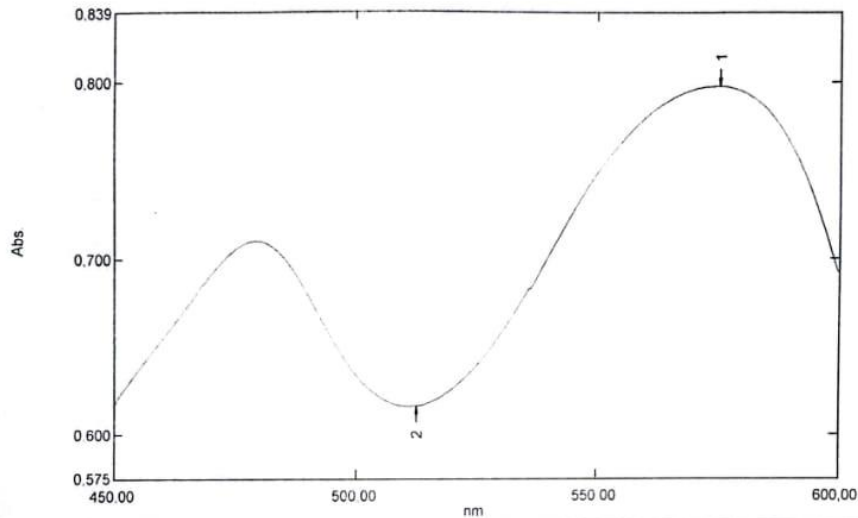
[Operation]
Threshold 0.0010000
Points 1
InterPolate Disabled
Average Disabled

[Sample Preparation Properties]
Weight
Volume
Dilution
Path Length
Additional Information

Spectrum Peak Pick Report

04/08/2023 14:45:14

Data Set: Panjang gel. Kontrol positif formalin - RawData



[Measurement Properties]
Wavelength Range (nm) 450.00 to 600.00
Scan Speed Fast
Sampling Interval 0.1
Auto Sampling Interval Enabled
Scan Mode Auto

No.	P/V	Wavelength	Abs.	Description
1	Ⓢ	575.20	0.798	

[Instrument Properties]
Instrument Type UV-1800 Series
Measuring Mode Absorbance
Slit Width 1.0 nm
Light Source Change Wavelength 340.0 nm
S/R Exchange Normal

[Attachment Properties]
Attachment None

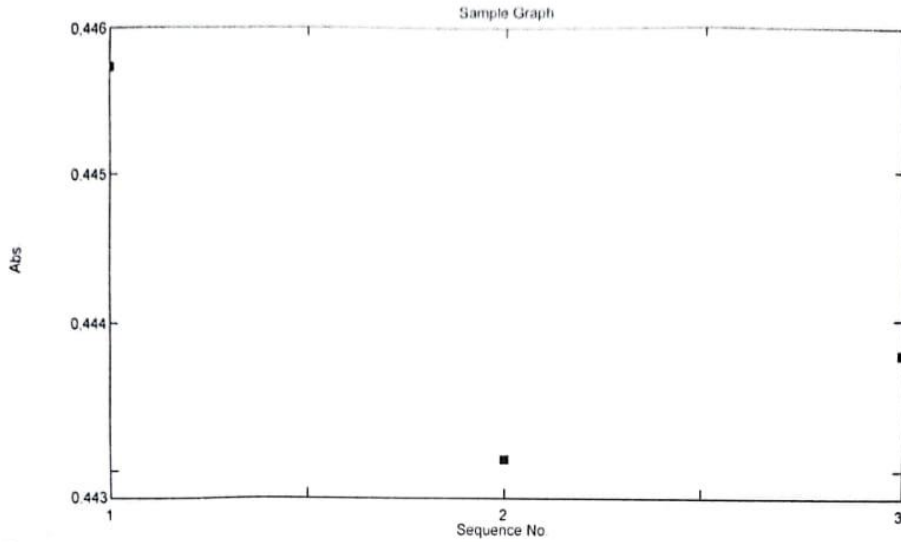
[Operation]
Threshold 0.0010000
Points 1
InterPolate Disabled
Average Disabled

[Sample Preparation Properties]
Weight
Volume
Dilution
Path Length
Additional Information

Sample Table Report

04/08/2023 14:57:29

File Name: C:\Users\HP\Documents\MIRNA\Kadar sampel A.pho



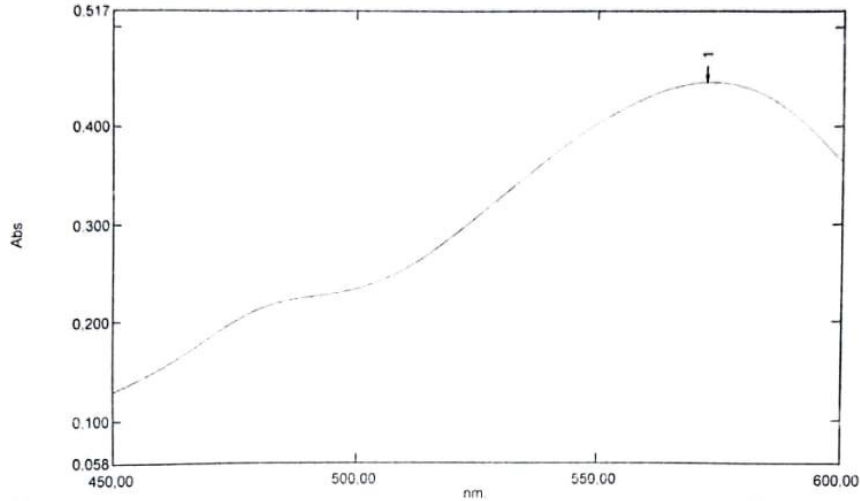
Sample Table

	Sample ID	Type	Ex	Conc	WL574,7	Comments
1	SampelA 1	Unknown		4.318	0.446	
2	SampelA 2	Unknown		4.266	0.443	
3	SampelA 3	Unknown		4.280	0.444	
4						

Spectrum Peak Pick Report

04/08/2023 14:55:29

Data Set: Panjang Gelombang sampel A_145417 - RawData



[Measurement Properties]
Wavelength Range (nm): 450.00 to 600.00
Scan Speed: Fast
Sampling Interval: 0.1
Auto Sampling Interval: Enabled
Scan Mode: Auto

No.	P/V	Wavelength	Abs.	Description
1	⊕	572.30	0.445	

[Instrument Properties]
Instrument Type: UV-1800 Series
Measuring Mode: Absorbance
Slit Width: 1.0 nm
Light Source Change Wavelength: 340.0 nm
S/R Exchange: Normal

[Attachment Properties]
Attachment: None

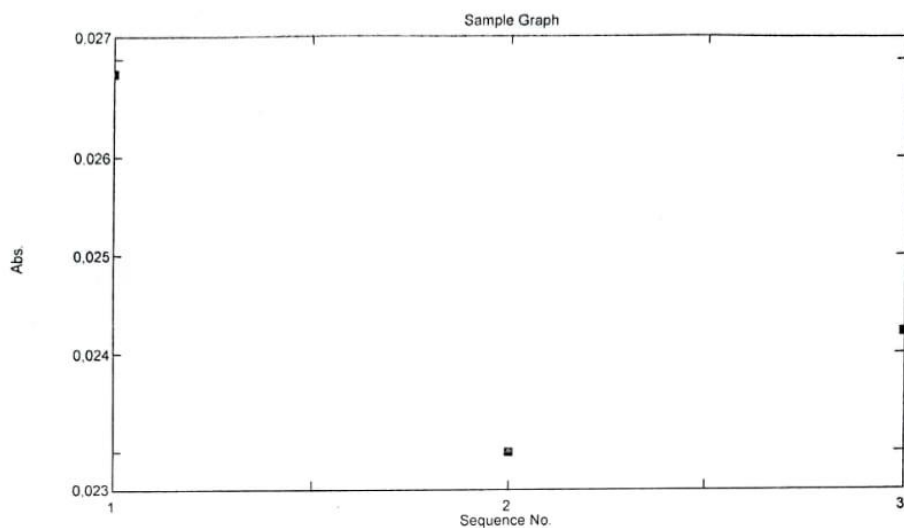
[Operation]
Threshold: 0.0010000
Points: 1
InterPolate: Disabled
Average: Disabled

[Sample Preparation Properties]
Weight:
Volume:
Dilution:
Path Length:
Additional Information:

Sample Table Report

04/08/2023 15:34:35

File Name: C:\Users\HP\Documents\MIRNA\Kadar sampel B.pho



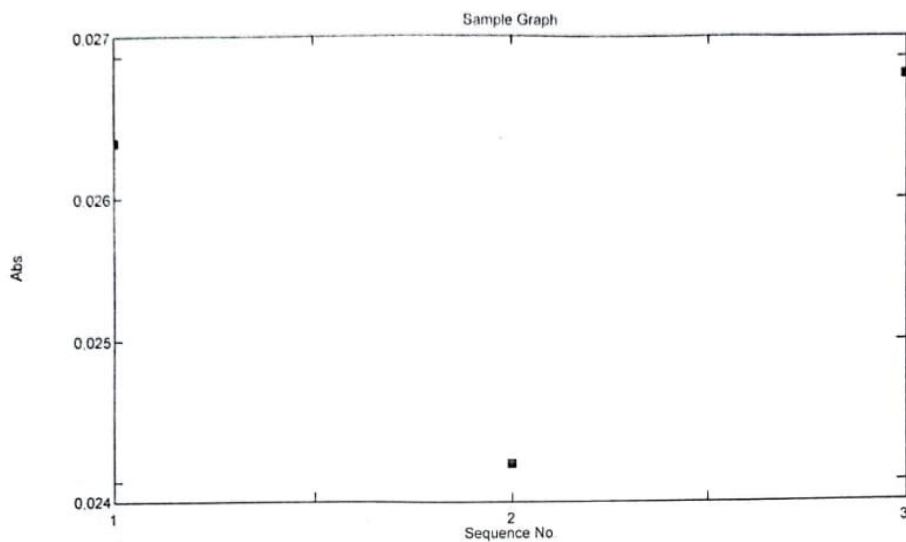
Sample Table

	Sample ID	Type	Ex	Conc	WL574,7	Comments
1	sampelB.1	Unknown		-3.991	0.027	
2	SampelB.2	Unknown		-4.067	0.023	
3	SampelB.3	Unknown		-4.043	0.024	
4						

Sample Table Report

04/08/2023 15:28:47

File Name: C:\Users\HP\Documents\MIRNA\Kadar sampel C.pho



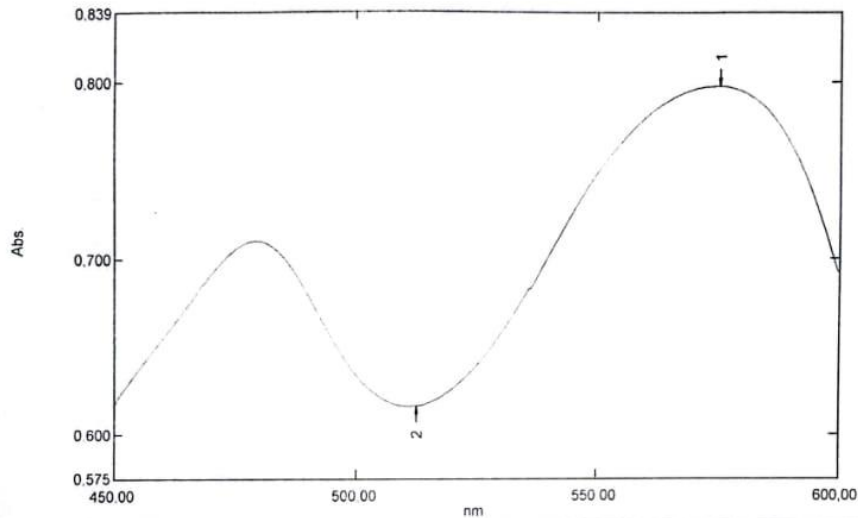
Sample Table

	Sample ID	Type	Ex	Conc	WL574,7	Comments
1	sampleC 1	Unknown		-4.000	0.026	
2	SampleC 2	Unknown		-4.045	0.024	
3	sampleC 3	Unknown		-3.990	0.027	
4						

Spectrum Peak Pick Report

04/08/2023 14:45:14

Data Set: Panjang gel. Kontrol positif formalin - RawData



[Measurement Properties]
Wavelength Range (nm) 450.00 to 600.00
Scan Speed Fast
Sampling Interval 0.1
Auto Sampling Interval Enabled
Scan Mode Auto

No.	P/V	Wavelength	Abs.	Description
1	Ⓢ	575.20	0.798	

[Instrument Properties]
Instrument Type UV-1800 Series
Measuring Mode Absorbance
Slit Width 1.0 nm
Light Source Change Wavelength 340.0 nm
S/R Exchange Normal

[Attachment Properties]
Attachment None

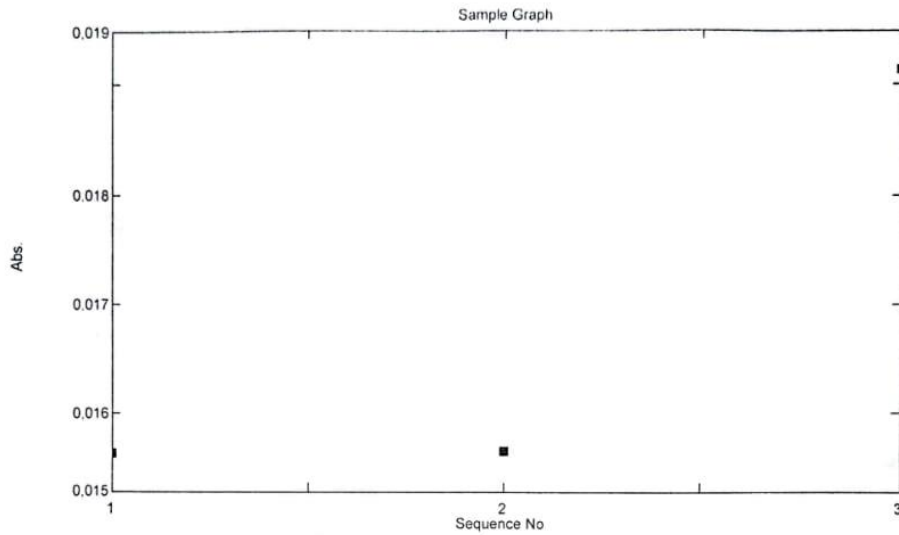
[Operation]
Threshold 0.0010000
Points 1
InterPolate Disabled
Average Disabled

[Sample Preparation Properties]
Weight
Volume
Dilution
Path Length
Additional Information

Sample Table Report

04/08/2023 15:30:04

File Name: C:\Users\HP\Documents\MIRNA\Kadar sampel D.pho



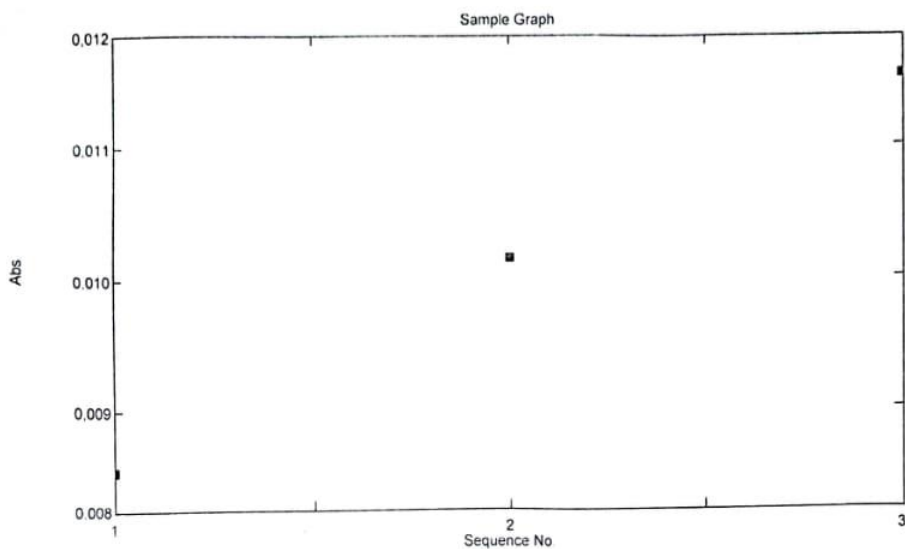
Sample Table

	Sample ID	Type	Ex	Conc	WL574,7	Comments
1	SampelD 1	Unknown		-4 213	0 016	
2	sampelD 2	Unknown		-4 213	0 016	
3	SampelD 3	Unknown		-4 144	0 019	
4						

Sample Table Report

04/08/2023 15:37:27

File Name: C:\Users\HP\Documents\MIRNA\Kadar sampel E.pho



Sample Table

	Sample ID	Type	Ex	Conc	WL574,7	Comments
1	SampelE 1	Unknown		-4.354	0.009	
2	SampelE 2	Unknown		-4.322	0.010	
3	SampelE 3	Unknown		-4.295	0.012	
4						

Kinetics Data Print Report

04/08/2023 13:32:24

Time (Minute)	RawData ...	RawData ...
1.000	0.798	0.792
2.000	0.798	0.793
3.000	0.798	0.793
4.000	0.798	0.794
5.000	0.799	0.794
6.000	0.799	0.794
7.000	0.799	0.795
8.000	0.799	0.795
9.000	0.799	0.796
10.000	0.799	0.796
11.000	0.799	0.796
12.000	0.799	0.796
13.000	0.799	0.796
14.000	0.799	0.796
15.000	0.799	0.796
16.000	0.798	0.796
17.000	0.798	0.796
18.000	0.798	0.796
19.000	0.798	0.796
20.000	0.798	0.797
21.000	0.798	0.797
22.000	0.798	0.797
23.000	0.798	0.797
24.000	0.798	0.797
25.000	0.798	0.797
26.000	0.798	0.797
27.000	0.798	0.798
28.000	0.798	0.798
29.000	0.798	0.798
30.000	0.798	0.798

Swati