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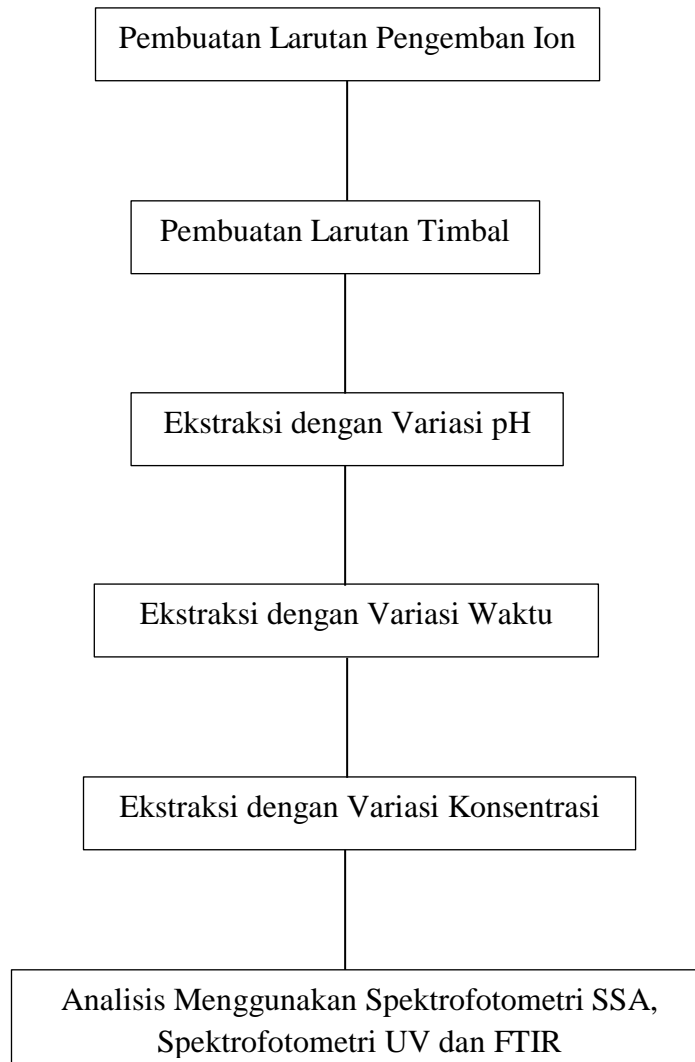
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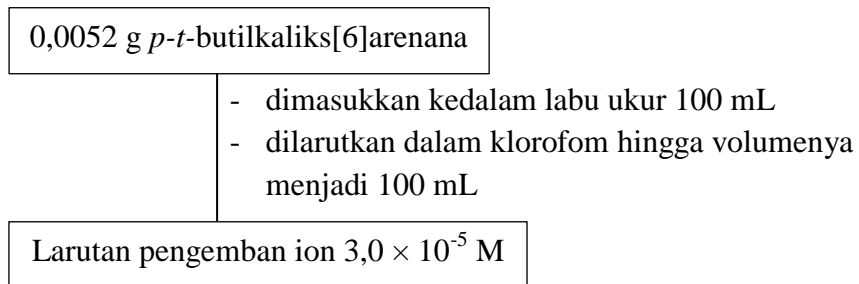
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Lampiran 1. Bagan Alir

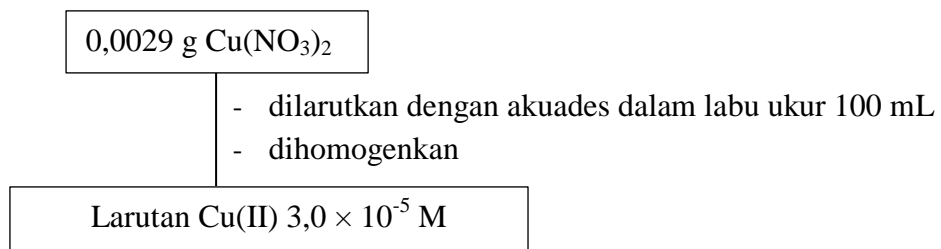


Lampiran 2. Bagan Kerja

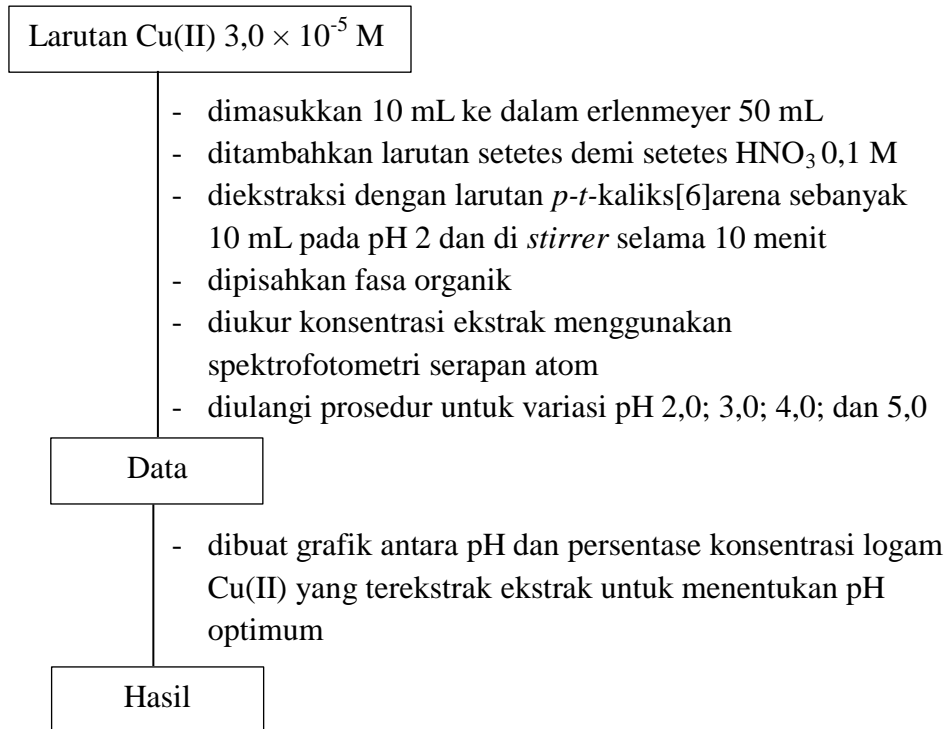
a. Pembuatan larutan pengemban ion



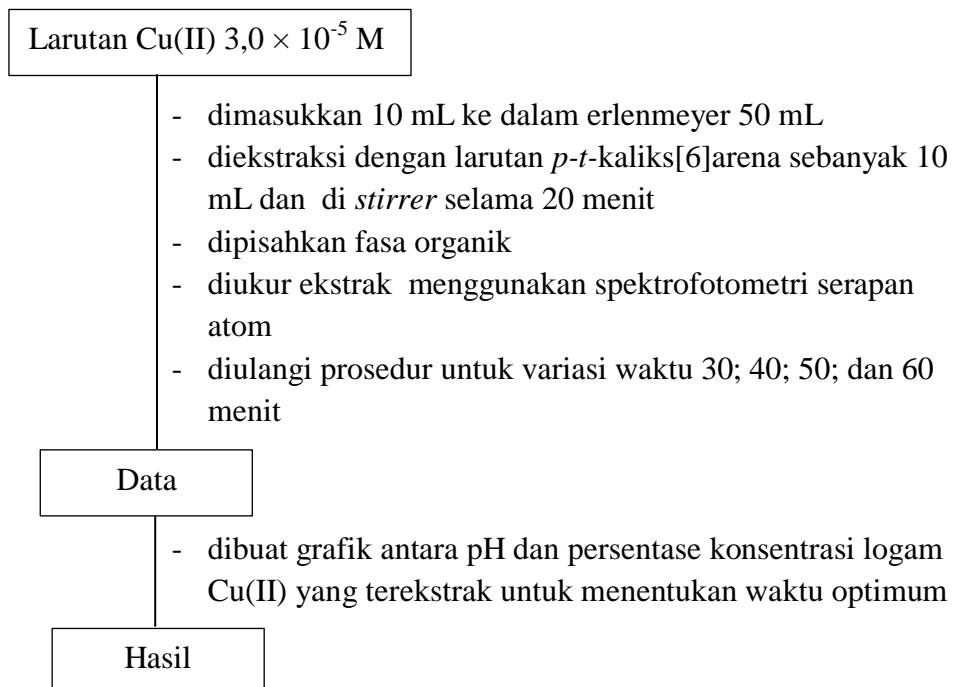
b. Pembuatan Larutan Induk Cu(II) $3,0 \times 10^{-5}$



c. Ekstraksi dengan variasi pH



d. Ekstraksi dengan variasi waktu



- e. Pembuatan larutan Cu(II) $3,0 \times 10^{-5}$; $2,0 \times 10^{-5}$; dan $1,0 \times 10^{-5}$ M dan larutan *p-t*-butilkaliks[6]arena $3,0 \times 10^{-5}$; $2,0 \times 10^{-5}$; dan $1,0 \times 10^{-5}$ M

Larutan Cu(II) $3,0 \times 10^{-5}$

- dipipet 6,66 mL ke dalam labu ukur 10 mL
- diencerkan dengan akuades sampai tanda batas
- dihomogenkan

Larutan Cu(II) $2,0 \times 10^{-5}$ M

Larutan Cu(II) $3,0 \times 10^{-5}$

- dipipet 3,33 mL ke dalam labu ukur 10 mL
- diencerkan dengan akuades sampai tanda batas
- dihomogenkan

Larutan Cu(II) $1,0 \times 10^{-5}$ M

Larutan *p-t*-butilkaliks[6]arena $3,0 \times 10^{-5}$ M

- dipipet 6,66 mL ke dalam labu ukur 10 mL
- diencerkan dengan kloroform sampai tanda batas
- dihomogenkan

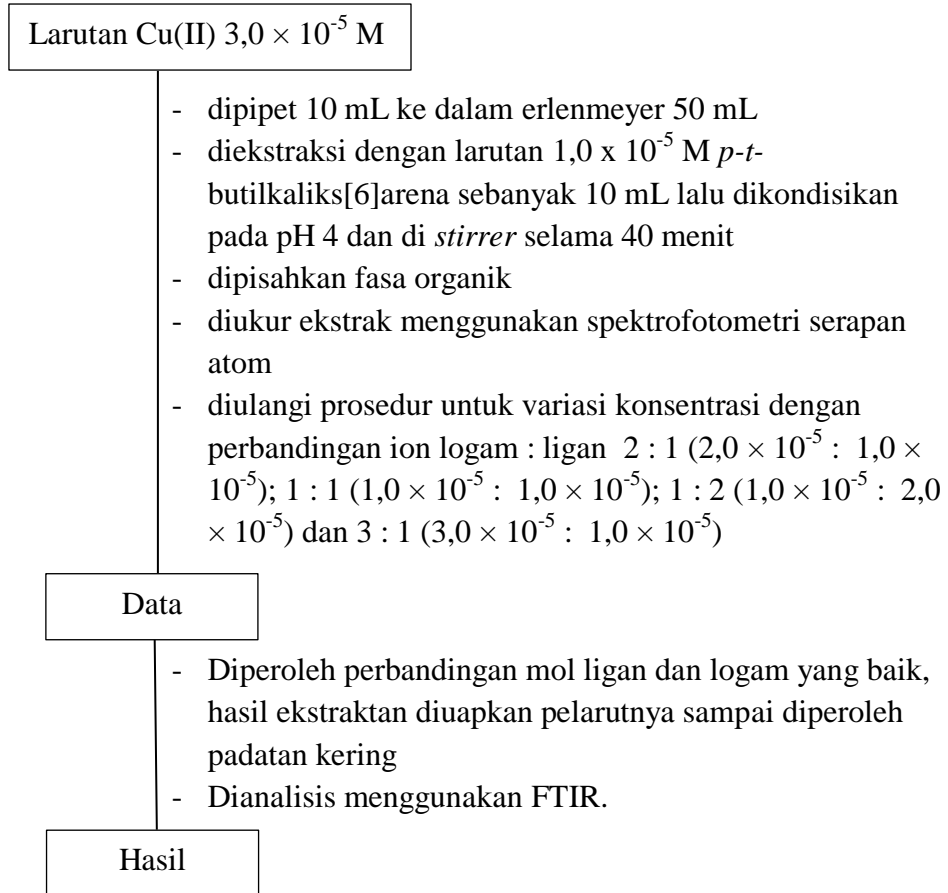
Larutan *p-t*-butilkaliks[6]arena $2,0 \times 10^{-5}$ M

Larutan *p-t*-butilkaliks[6]arena $3,0 \times 10^{-5}$ M

- dipipet 3,33 mL ke dalam labu ukur 10 mL
- diencerkan dengan kloroform sampai tanda batas
- dihomogenkan

Larutan *p-t*-butilkaliks[6]arena $1,0 \times 10^{-5}$ M

f. Ekstraksi dengan variasi Konsentrasi



Lampiran 3. Perhitungan

1. Pembuatan larutan pengemban ion *p-t*-butilkaliks[6]arena $3,0 \times 10^{-5}$ M

$$\begin{aligned}G &= M \times Mr \times L \\ &= 3 \times 10^{-5} \text{ M} \times 973,4 \text{ g/mol} \times 0,1 \text{ L} \\ &= 0,0029 \text{ gram}\end{aligned}$$

2. Pembuatan larutan induk tembaga $3,0 \times 10^{-5}$ M dalam 100 mL

$$\begin{aligned}M &= \frac{G}{Mr} \times \frac{1000}{V} \\ G &= M \times Mr \times L \\ &= 3 \times 10^{-4} \text{ M} \times 187,5 \text{ g/mol} \times 0,1 \text{ L} \\ &= 0,0056 \text{ gram}\end{aligned}$$

3. Pembuatan Larutan HNO_3 0,1 M dari HNO_3 6 M sebanyak 100 mL

$$\begin{aligned}M_1 \times V_1 &= M_2 \times V_2 \\ 6 \text{ M} \times V_1 &= 0,1 \text{ M} \times 100 \text{ mL} \\ V_1 &= 1,6 \text{ mL}\end{aligned}$$

4. Pembuatan larutan standar dari larutan induk 10 ppm

a. Konsentrasi 5 ppm dalam 50 mL

$$\begin{aligned}M_1 \times V_1 &= M_2 \times V_2 \\ 10 \text{ ppm} \times V_1 &= 5 \text{ ppm} \times 50 \text{ mL} \\ V_1 &= 25 \text{ mL}\end{aligned}$$

b. Konsentrasi 3 ppm dalam 50 mL

$$\begin{aligned}M_1 \times V_1 &= M_2 \times V_2 \\ 10 \text{ ppm} \times V_1 &= 3 \text{ ppm} \times 50 \text{ mL}\end{aligned}$$

$$V_1 = 15 \text{ mL}$$

- c. Konsentrasi 2 ppm dalam 50 mL

$$M_1 \times V_1 = M_2 \times V_2$$

$$10 \text{ ppm} \times V_1 = 2 \text{ ppm} \times 50 \text{ mL}$$

$$V_1 = 10 \text{ mL}$$

- d. Konsentrasi 1 ppm dalam 50 mL

$$M_1 \times V_1 = M_2 \times V_2$$

$$10 \text{ ppm} \times V_1 = 1 \text{ ppm} \times 50 \text{ mL}$$

$$V_1 = 5 \text{ mL}$$

- e. Konsentrasi 0,5 ppm dalam 50 mL

$$M_1 \times V_1 = M_2 \times V_2$$

$$10 \text{ ppm} \times V_1 = 0,5 \text{ ppm} \times 50 \text{ mL}$$

$$V_1 = 2,5 \text{ mL}$$

5. Konsentrasi Cu(II) yang terekstrak pada variasi pH

- a. pH 2

$$\text{Persentase} = \frac{\text{Konsentrasi Akhir}}{\text{Konsentrasi Awal}} \times 100 \%$$

$$= \frac{1,84 \times 10^{-5}}{3,0 \times 10^{-5}} \times 100 \%$$

$$= 61,3 \%$$

- b. pH 3

$$\text{persentase} = \frac{\text{Konsentrasi Akhir}}{\text{Konsentrasi Awal}} \times 100 \%$$

$$= \frac{1,94 \times 10^{-5}}{3,0 \times 10^{-5}} \times 100 \%$$

$$= 64,6 \%$$

c. pH 4

$$\text{persentase} = \frac{\text{Konsentrasi Akhir}}{\text{Konsentrasi Awal}} \times 100 \%$$

$$= \frac{2,11 \times 10^{-5}}{3,0 \times 10^{-5}} \times 100 \%$$

$$= 70,3 \%$$

d. pH 5

$$\text{persentase} = \frac{\text{Konsentrasi Akhir}}{\text{Konsentrasi Awal}} \times 100 \%$$

$$= \frac{1,98 \times 10^{-5}}{3,0 \times 10^{-5}} \times 100 \%$$

$$= 66,3 \%$$

6. Konsentrasi Cu(II) yang terekstrak pada variasi waktu

a. 20 menit

$$\text{persentase} = \frac{\text{Konsentrasi Akhir}}{\text{Konsentrasi Awal}} \times 100 \%$$

$$= \frac{2,27 \times 10^{-5}}{3,0 \times 10^{-5}} \times 100 \%$$

$$= 75,8 \%$$

b. 30 menit

$$\text{persentase} = \frac{\text{Konsentrasi Akhir}}{\text{Konsentrasi Awal}} \times 100 \%$$

$$= \frac{2,71 \times 10^{-5}}{3,0 \times 10^{-5}} \times 100 \%$$

$$= 90,4 \%$$

c. 40 menit

$$\text{persentase} = \frac{\text{Konsentrasi Akhir}}{\text{Konsentrasi Awal}} \times 100 \%$$

$$= \frac{2,89 \times 10^{-5}}{3,0 \times 10^{-5}} \times 100 \%$$

$$= 96,4 \%$$

d. 50 menit

$$\text{Persentase} = \frac{\text{Konsentrasi Akhir}}{\text{Konsentrasi Awal}} \times 100 \%$$

$$= \frac{2,87 \times 10^{-5}}{3,0 \times 10^{-5}} \times 100 \%$$

$$= 95,7 \%$$

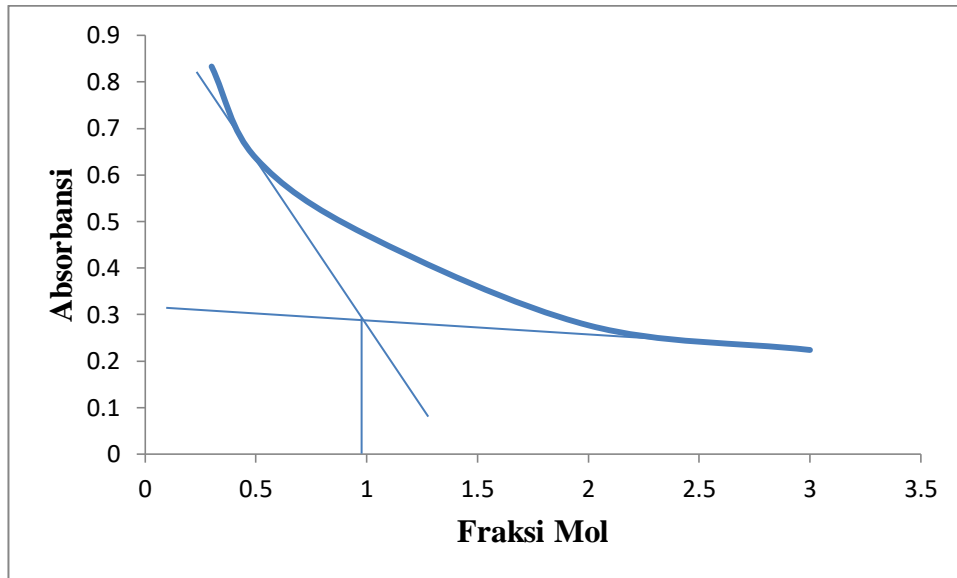
e. 60 menit

$$\text{persentase} = \frac{\text{Konsentrasi Akhir}}{\text{Konsentrasi Awal}} \times 100 \%$$

$$= \frac{2,59 \times 10^{-5}}{3,0 \times 10^{-5}} \times 100 \%$$

$$= 86,45 \%$$

7. Perbandingan konsentrasi ion logam Cu(II) dengan pengemban ion *p-t*-butilkakis[6]arena



$$Y_{(1)} = -0,4812x + 0,9354$$

$$Y_{(2)} = -0,1235x + 0,571$$

$$Y_{(1)} = Y_{(2)}$$

$$-0,4812x + 0,9354 = -0,1235x + 0,571$$

$$-0,4812x + 0,1235x = 0,571 - 0,9354$$

$$-0,3577x = -0,3644$$

$$x = \frac{-0,3644}{-0,3577}$$

$$x = 1,02$$

Lampiran 4. Data Spektrofotometri Serapan Atom

a. Ekstraksi logam Cu(II) dengan *p-t*-butilkaliks[6]arena menggunakan variasi Ph

pH	Absorbansi	Konsentrasi (ppm)	Konsentrasi (10^{-5} M)	% Terekstrak
2	0.281	3.453865337	1.84	61.3
3	0.296	3.640897756	1.94	64.6
4	0.321	3.952618454	2.11	70.3
5	0.303	3.728179551	1.98	66.3

b. Ekstraksi logam Cu(II) dengan *p-t*-butilkaliks[6]arena menggunakan variasi waktu

Waktu	Absorbansi	Konsentrasi (ppm)	Konsentrasi (10^{-5} M)	% Terekstrak
20	0.118	4.264339152	2.27	75.81
30	0.14	5.087281796	2.71	90.44
40	0.149	5.42394015	2.89	96.42
50	0.148	5.386533666	2.87	95.76
60	0.134	4.862842893	2.59	86.45

Lampiran 5. Data Spektrofotometri UV-Vis

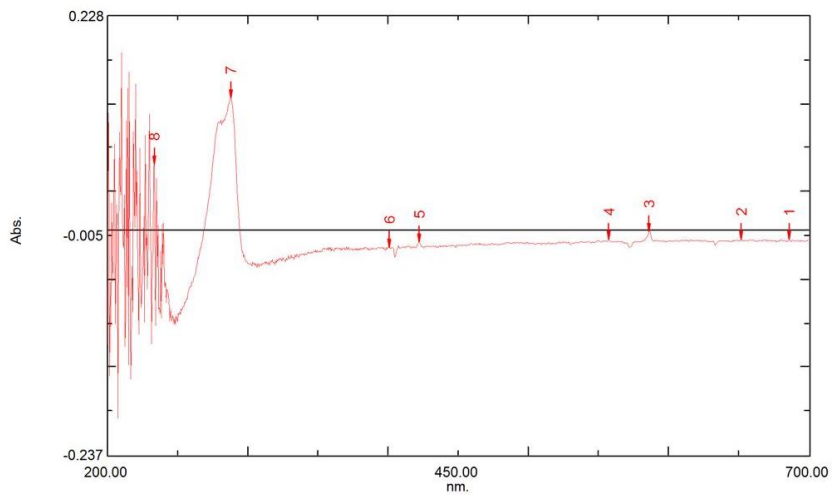
1. Spektrum *p-t*-butilkaliks[6]arena

a. *p-t*-butilkaliks[6]arena $1,0 \times 10^{-5}$ M

Spectrum Peak Pick Report

05/27/2021 03:01:39 PM

Data Set: Kaliks6arena 1x10⁻⁵ M.spc - RawData



[Measurement Properties]
 Wavelength Range (nm.): 200.00 to 700.00
 Scan Speed: Medium
 Sampling Interval: 0.5
 Auto Sampling Interval: Enabled
 Scan Mode: Single

[Instrument Properties]
 Instrument Type: UV-2600 Series
 Measuring Mode: Absorbance
 Slit Width: 0.2
 Accumulation time: 0.1 sec.
 Light Source Change Wavelength: 323.0 nm
 Detector Unit: Direct
 S/R Exchange: Normal
 Stair Correction: OFF

[Attachment Properties]
 Attachment: None

[Operation]
 Threshold: 0.0010000
 Points: 4
 InterPolate: Disabled
 Average: Disabled

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

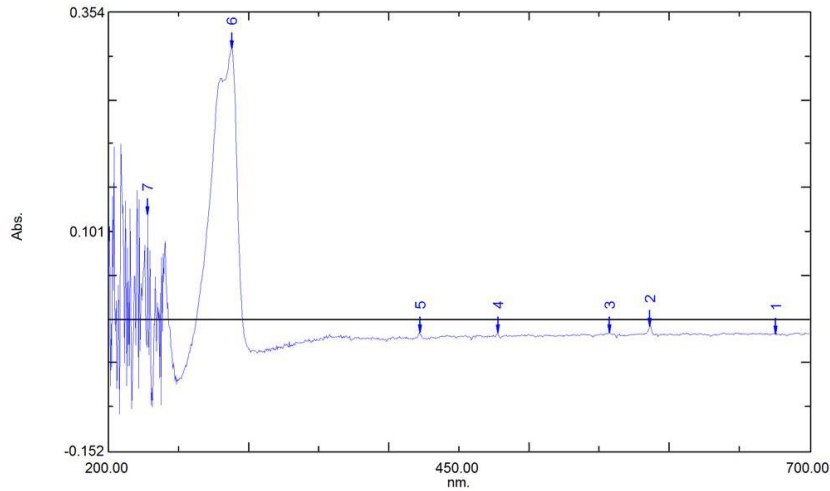
No.	P/V	Wavelength	Abs.	Description
1	●	686.50	-0.009	
2	●	651.50	-0.009	
3	●	586.50	-0.001	
4	●	557.50	-0.009	
5	●	422.00	-0.012	
6	●	400.50	-0.017	
7	●	288.00	0.141	
8	●	233.50	0.071	

b. *p-t*-butilkaliks[6]arena $2,0 \times 10^{-5}$ M

Spectrum Peak Pick Report

05/27/2021 03:03:06 PM

Data Set: Kaliks6arena 2 x10⁻⁵ M.spc - RawData



[Measurement Properties]
Wavelength Range (nm.): 200.00 to 700.00
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Sampling Interval: 0.5
Auto Sampling Interval: Enabled
Scan Mode: Single

[Instrument Properties]
Instrument Type: UV-2600 Series
Measuring Mode: Absorbance
Slit Width: 0.2
Accumulation time: 0.1 sec.
Light Source Change Wavelength: 323.0 nm
Detector Unit: Direct
S/R Exchange: Normal
Stair Correction: OFF

[Attachment Properties]
Attachment: None

[Operation]
Threshold: 0.0010000
Points: 4
InterPolate: Disabled
Average: Disabled

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

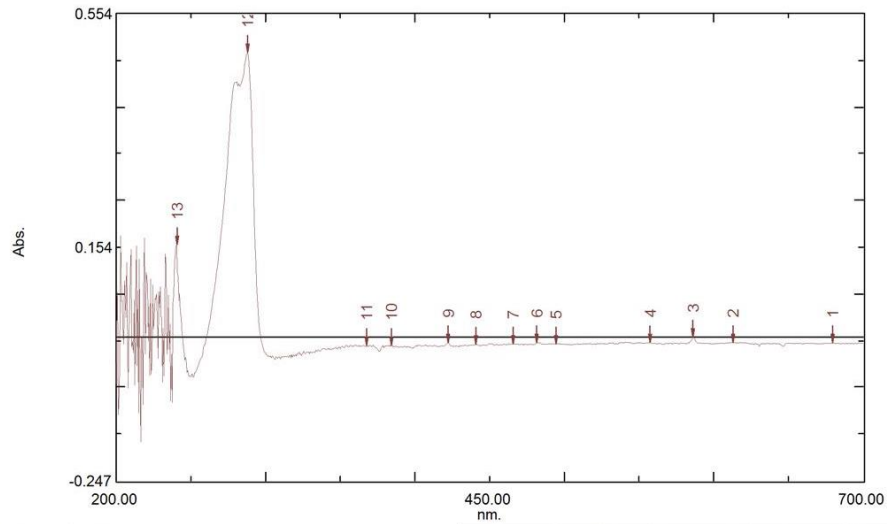
No.	P/V	Wavelength	Abs.	Description
1	●	675.50	-0.017	
2	●	586.50	-0.008	
3	●	557.00	-0.016	
4	●	477.50	-0.016	
5	●	422.00	-0.016	
6	●	288.00	0.312	
7	●	228.00	0.121	

c. *p-t*-butilkaliks[6]arena $3,0 \times 10^{-5}$ M

Spectrum Peak Pick Report

05/27/2021 03:03:58 PM

Data Set: Kaliks6arena 3 x10⁻⁵ M.spc - RawData



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Sampling Interval: 0.5
Auto Sampling Interval: Enabled
Scan Mode: Single

[Instrument Properties]
Instrument Type: UV-2600 Series
Measuring Mode: Absorbance
Slit Width: 0.2
Accumulation time: 0.1 sec.
Light Source Change Wavelength: 323.0 nm
Detector Unit: Direct
S/R Exchange: Normal
Stair Correction: OFF

[Attachment Properties]
Attachment: None

[Operation]
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Points: 4
InterPolate: Disabled
Average: Disabled

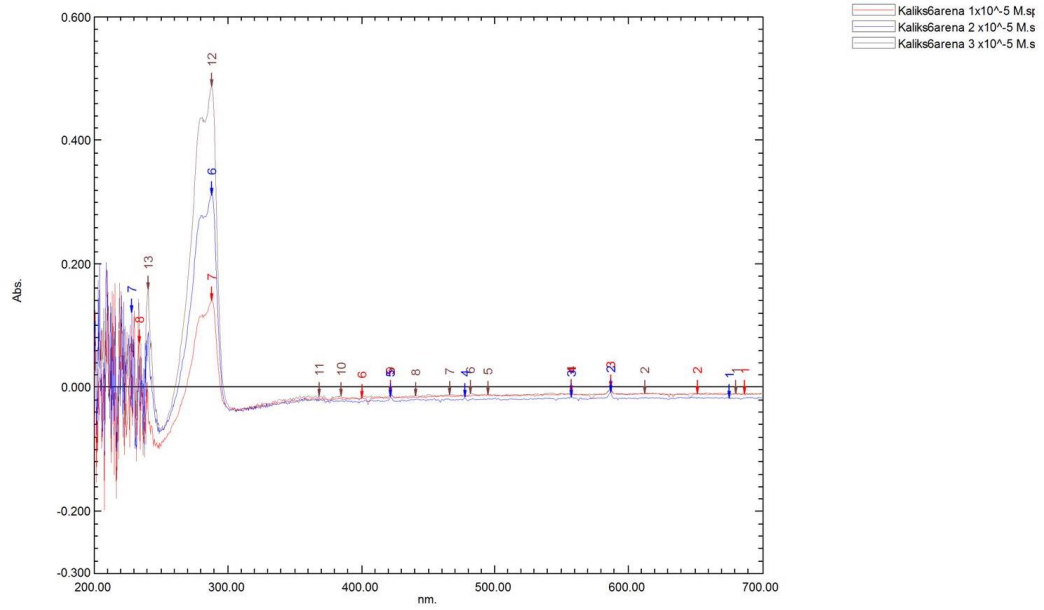
[Sample Preparation Properties]
Weight:
Volume:
Dilution:
Path Length:
Additional Information:

No.	P/V	Wavelength	Abs.	Description
1	⊕	680.00	-0.010	
2	⊕	612.50	-0.009	
3	⊕	586.50	-0.001	
4	⊕	557.50	-0.009	
5	⊕	494.50	-0.011	
6	⊕	481.50	-0.010	
7	⊕	466.00	-0.011	
8	⊕	440.50	-0.013	
9	⊕	422.00	-0.010	
10	⊕	384.50	-0.014	
11	⊕	368.00	-0.014	
12	⊕	288.00	0.487	
13	⊕	240.50	0.158	

- d. Overlay Spektrum *p-t*-butilkaliks[6]arena $2,0 \times 10^{-5} \text{ M}$; $2,0 \times 10^{-5} \text{ M}$
dan $2,0 \times 10^{-5} \text{ M}$

Overlay Spectrum Graph Report

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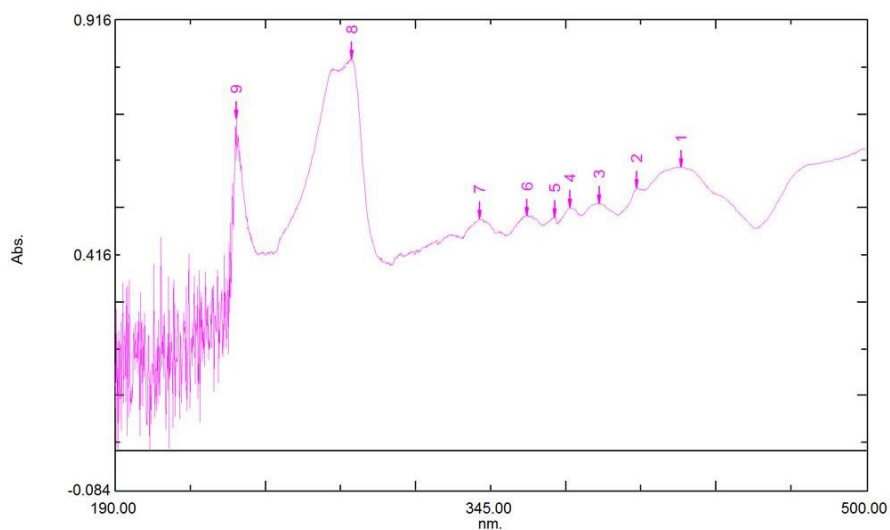
2. Spektrum Cu(II)- *p-t*-butilkaliks[6]arena

a. Cu(II)- *p-t*-butilkaliks[6]arena (1 : 3)

Spectrum Peak Pick Report

04/22/2021 02:43:44 PM

Data Set: Andi Nurmi Ekstraksi Kaliks 6 arena 1 3.spc - RawData



[Measurement Properties]
Wavelength Range (nm.): 190.00 to 500.00
Scan Speed: Medium
Sampling Interval: 0.2
Auto Sampling Interval: Enabled
Scan Mode: Single

[Instrument Properties]
Instrument Type: UV-2600 Series
Measuring Mode: Absorbance
Slit Width: 0.2
Accumulation time: 0.1 sec.
Light Source Change Wavelength: 323.0 nm
Detector Unit: Direct
S/R Exchange: Normal
Stair Correction: OFF

[Attachment Properties]
Attachment: None

[Operation]
Threshold: 0.0010000
Points: 4
InterPolate: Disabled
Average: Disabled

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

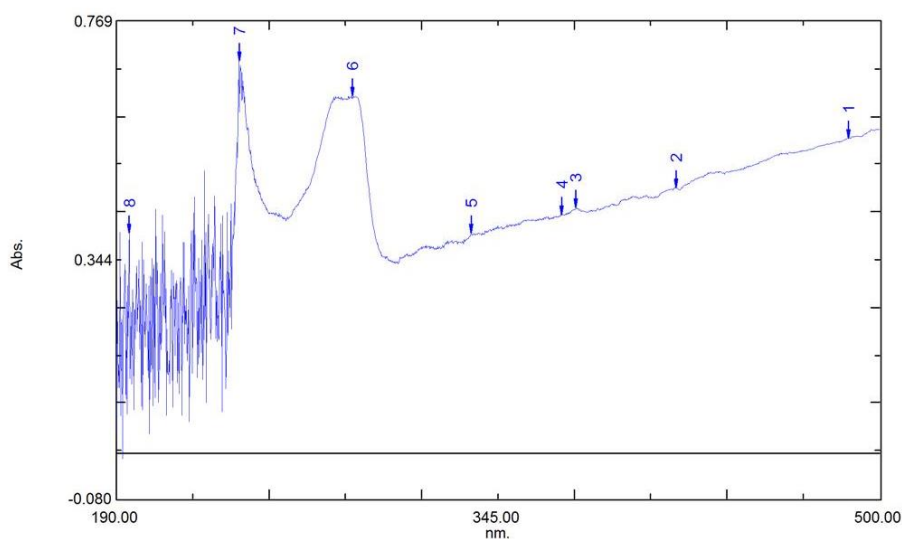
No.	P/V	Wavelength	Abs.	Description
1	①	423.60	0.604	
2	②	405.20	0.559	
3	③	389.60	0.526	
4	④	377.60	0.516	
5	⑤	371.60	0.495	
6	⑥	359.80	0.500	
7	⑦	340.20	0.493	
8	⑧	287.40	0.833	
9	⑨	240.20	0.705	

b. Cu(II)- *p-t*-butilkaliks[6]arena (1 : 2)

Spectrum Peak Pick Report

04/22/2021 02:37:56 PM

Data Set: Andi Nurmi Ekstraksi Kaliks 6 arena 1 2.spc - RawData



[Measurement Properties]
Wavelength Range (nm.): 190.00 to 500.00
Scan Speed: Medium
Sampling Interval: 0.2
Auto Sampling Interval: Enabled
Scan Mode: Single

[Instrument Properties]
Instrument Type: UV-2600 Series
Measuring Mode: Absorbance
Slit Width: 0.2
Accumulation time: 0.1 sec.
Light Source Change Wavelength: 323.0 nm
Detector Unit: Direct
S/R Exchange: Normal
Stair Correction: OFF

[Attachment Properties]
Attachment: None

[Operation]
Threshold: 0.0010000
Points: 4
InterPolate: Disabled
Average: Disabled

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

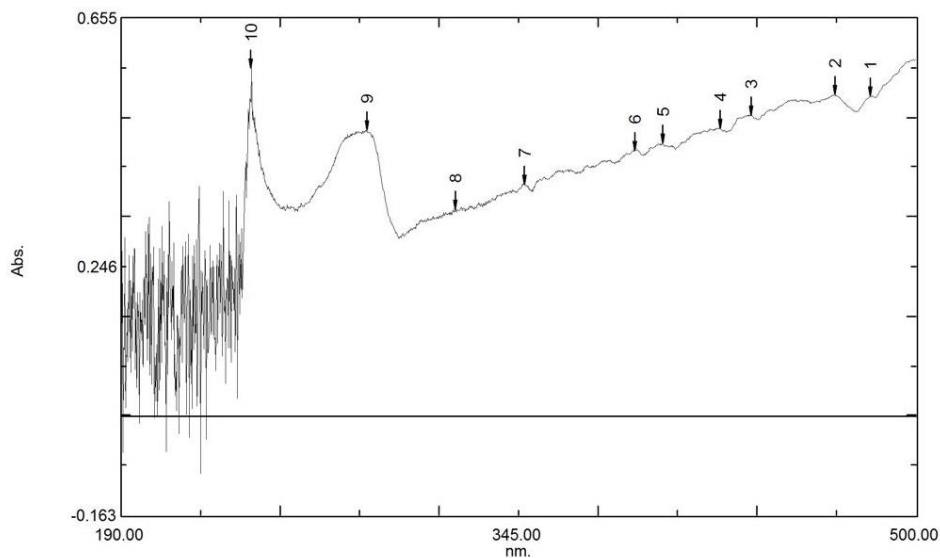
No.	P/V	Wavelength	Abs.	Description
1	●	487.40	0.561	
2	●	417.40	0.472	
3	●	376.80	0.436	
4	●	370.60	0.425	
5	●	334.20	0.392	
6	●	285.80	0.636	
7	●	239.80	0.698	
8	●	195.40	0.391	

c. Cu(II)- *p-t*-butilkaliks[6]arena (1 : 1)

Spectrum Peak Pick Report

04/22/2021 02:32:20 PM

Data Set: Andi Nurmi Ekstraksi Kaliks 6 arena 1 1.spc - RawData



[Measurement Properties]
 Wavelength Range (nm.): 190.00 to 500.00
 Scan Speed: Medium
 Sampling Interval: 0.2
 Auto Sampling Interval: Enabled
 Scan Mode: Single

[Instrument Properties]
 Instrument Type: UV-2600 Series
 Measuring Mode: Absorbance
 Slit Width: 0.2
 Accumulation time: 0.1 sec.
 Light Source Change Wavelength: 323.0 nm
 Detector Unit: Direct
 S/R Exchange: Normal
 Stair Correction: OFF

[Attachment Properties]
 Attachment: None

[Operation]
 Threshold: 0.0010000
 Points: 4
 InterPolate: Disabled
 Average: Disabled

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

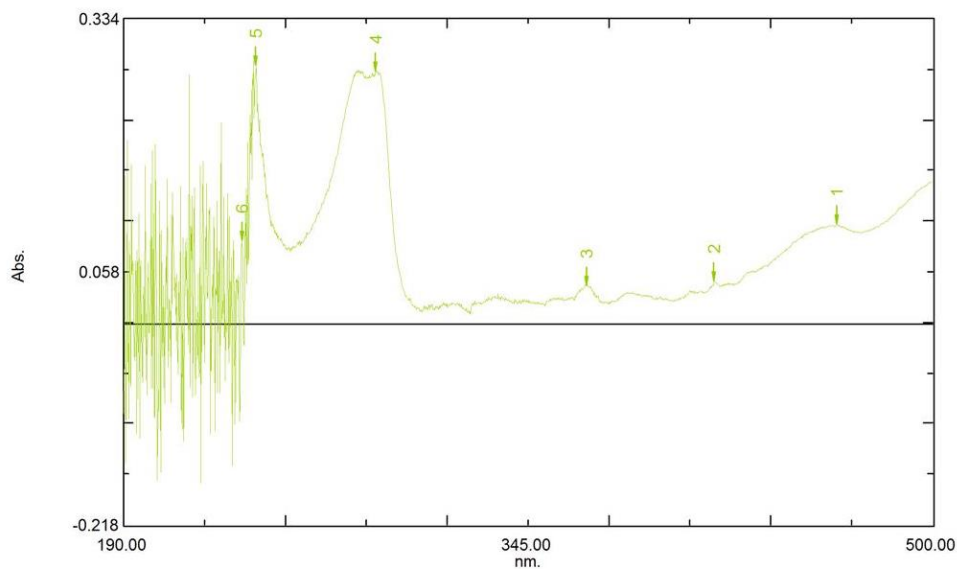
No.	P/V	Wavelength	Abs.	Description
1	🟢	482.40	0.527	
2	🟢	468.20	0.528	
3	🟢	435.60	0.495	
4	🟢	423.60	0.474	
5	🟢	401.00	0.448	
6	🟢	390.60	0.438	
7	🟢	347.40	0.382	
8	🟢	320.40	0.340	
9	🟢	285.80	0.471	
10	🟢	240.80	0.573	

d. Cu(II)- *p-t*-butilkaliks[6]arena (2 : 1)

Spectrum Peak Pick Report

04/22/2021 02:26:58 PM

Data Set: Andi Nurmi Ekstraksi Kaliks 6 arena 2 1.spc - RawData



[Measurement Properties]
 Wavelength Range (nm.): 190.00 to 500.00
 Scan Speed: Medium
 Sampling Interval: 0.2
 Auto Sampling Interval: Enabled
 Scan Mode: Single

[Instrument Properties]
 Instrument Type: UV-2600 Series
 Measuring Mode: Absorbance
 Slit Width: 0.2
 Accumulation time: 0.1 sec.
 Light Source Change Wavelength: 323.0 nm
 Detector Unit: Direct
 S/R Exchange: Normal
 Stair Correction: OFF

[Attachment Properties]
 Attachment: None

[Operation]
 Threshold: 0.0010000
 Points: 4
 InterPolate: Disabled
 Average: Disabled

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

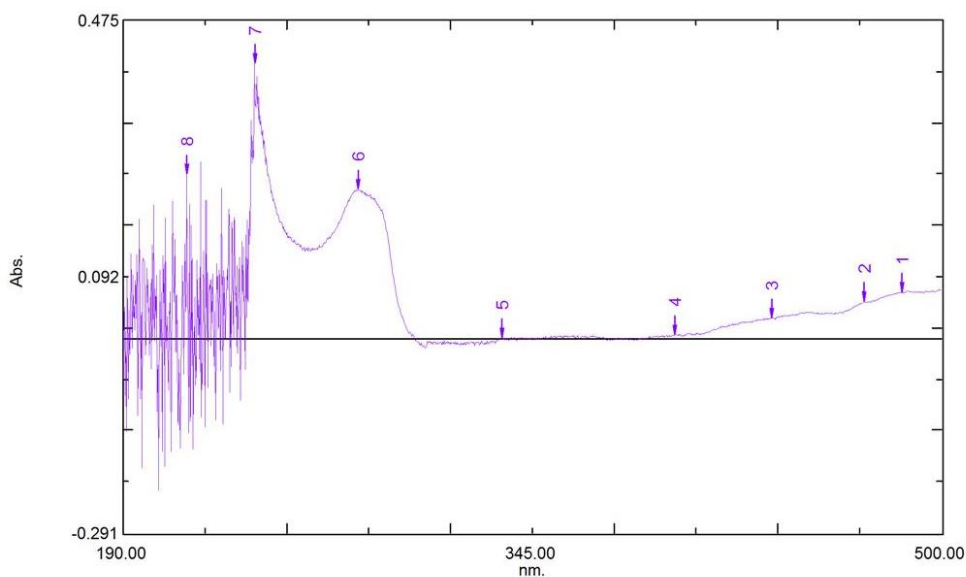
No.	P/V	Wavelength	Abs.	Description
1	Ⓢ	463.20	0.110	
2	Ⓢ	416.20	0.048	
3	Ⓢ	367.20	0.043	
4	Ⓢ	286.60	0.277	
5	Ⓢ	240.80	0.283	
6	Ⓢ	235.40	0.093	

e. Cu(II)- *p-t*-butilkaliks[6]arena (3 : 1)

Spectrum Peak Pick Report

04/22/2021 02:21:37 PM

Data Set: Andi Nurmi Ekstraksi Kaliks 6 arena 3 1.spc - RawData



[Measurement Properties]
Wavelength Range (nm.): 190.00 to 500.00
Scan Speed: Medium
Sampling Interval: 0.2
Auto Sampling Interval: Enabled
Scan Mode: Single

[Instrument Properties]
Instrument Type: UV-2600 Series
Measuring Mode: Absorbance
Slit Width: 0.2
Accumulation time: 0.1 sec.
Light Source Change Wavelength: 323.0 nm
Detector Unit: Direct
S/R Exchange: Normal
Stair Correction: OFF

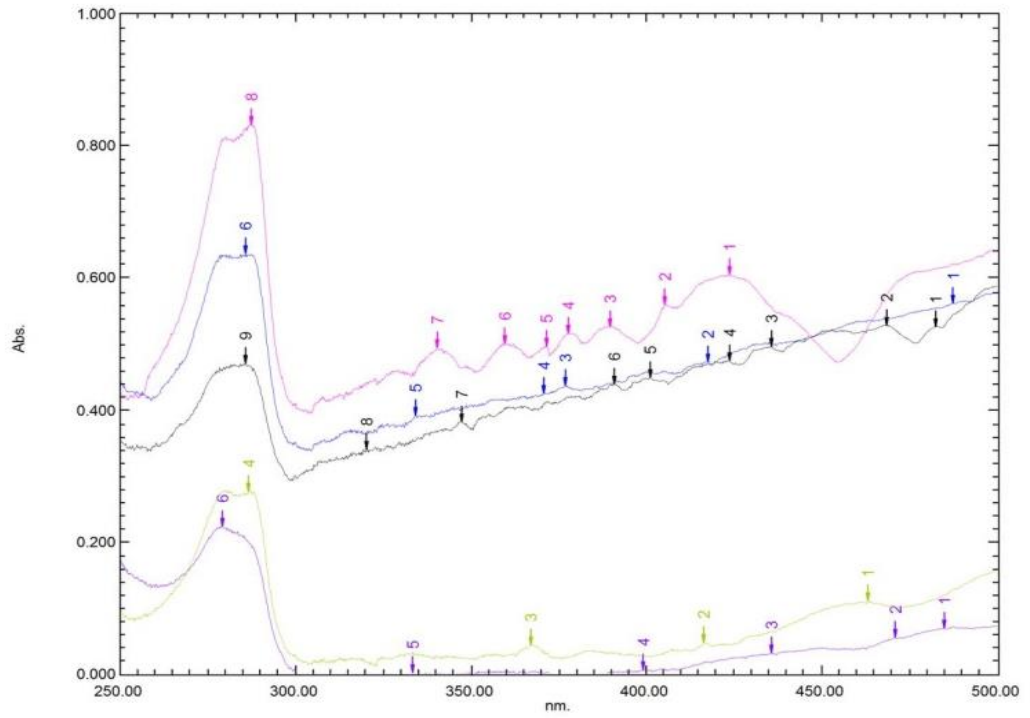
[Attachment Properties]
Attachment: None

[Operation]
Threshold: 0.0010000
Points: 4
InterPolate: Disabled
Average: Disabled

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

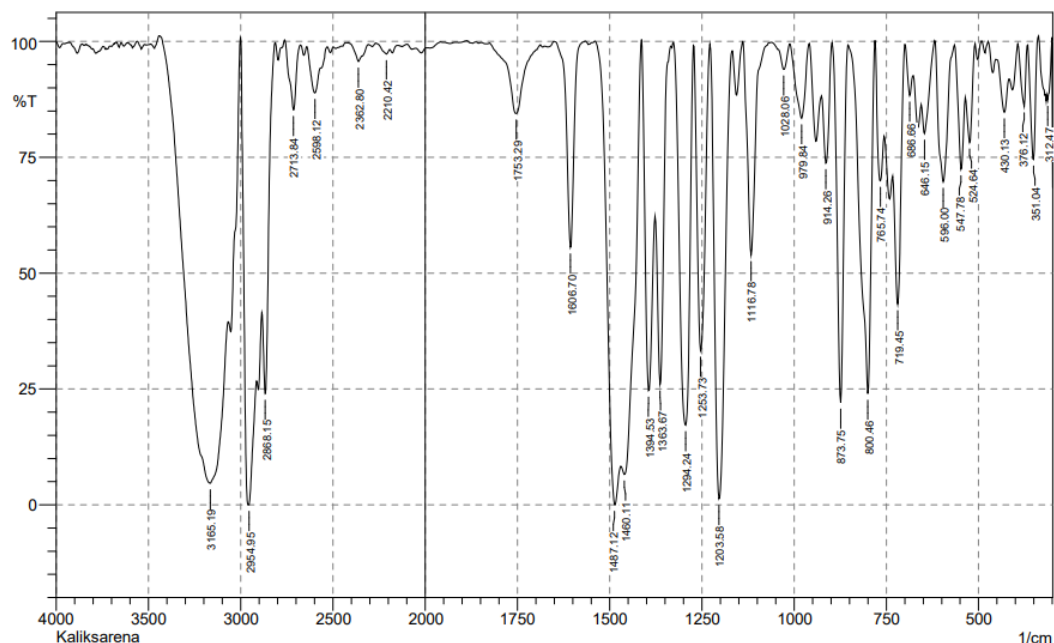
No.	P/V	Wavelength	Abs.	Description
1	📍	484.80	0.069	
2	📍	471.00	0.055	
3	📍	435.60	0.031	
4	📍	399.00	0.006	
5	📍	333.40	0.002	
6	📍	279.00	0.224	
7	📍	239.80	0.411	
8	📍	214.00	0.246	

f. Overlay Spektrum Cu(II)- *p-t*-butilkaliks[6]arena



Lampiran 6. Data FT-IR

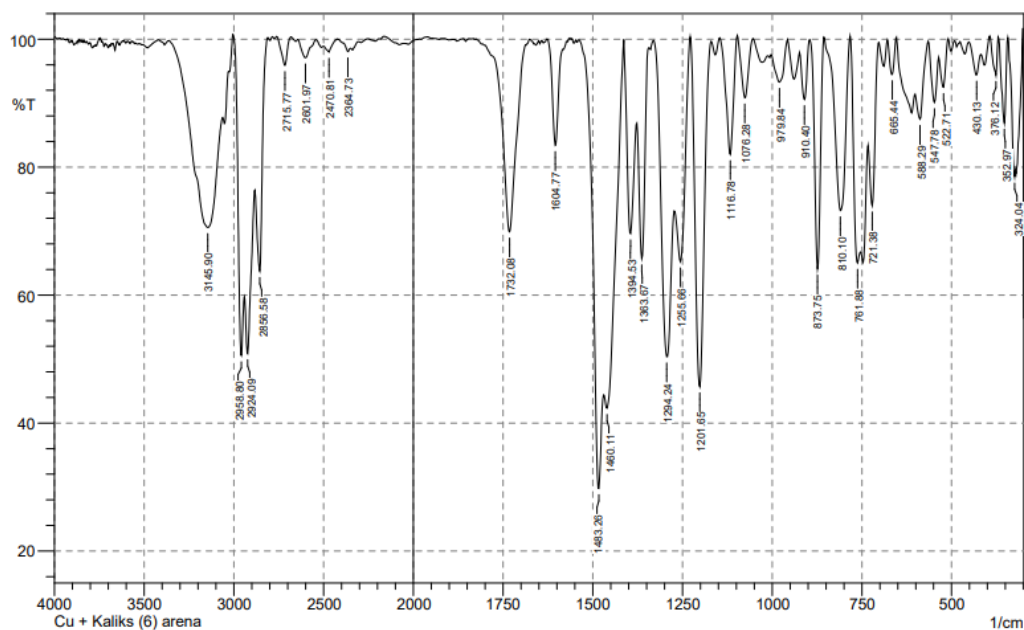
SHIMADZU



No.	Peak	Intensity	Corr. Intensity	Base (H)	Base (L)	Area	Corr. Area
1	312.47	87.423	11.479	337.54	302.82	1.373	1.297
2	351.04	74.515	25.656	366.48	339.47	1.705	1.717
3	376.12	86.007	13.32	393.48	366.48	0.891	0.815
4	430.13	84.697	8.565	453.27	418.55	1.582	0.633
5	524.64	78.188	13.801	534.28	511.14	1.617	0.916
6	547.78	72.439	20.022	565.14	536.21	2.318	1.413
7	596	69.752	29.74	617.22	567.07	4.068	3.935
8	646.15	80.133	8.7	653.87	619.15	1.832	0.739
9	686.66	88.353	7.078	700.16	677.01	0.761	0.344
10	719.45	43.311	39.313	732.95	700.16	6.557	4.205
11	765.74	69.927	17.454	779.24	756.1	2.744	1.421
12	800.46	23.975	75.942	852.54	781.17	15.567	15.464
13	873.75	22.059	77.426	896.9	854.47	9.985	9.893
14	914.26	73.759	19.081	925.83	898.83	2.211	1.465
15	979.84	83.438	15.927	1010.7	960.55	2.18	2.044
16	1028.06	93.95	4.901	1043.49	1010.7	0.52	0.36
17	1116.78	53.923	45.916	1138	1062.78	5.71	5.654
18	1203.58	1.272	96.91	1226.73	1168.86	31.776	31.303
19	1253.73	33.273	65.857	1271.09	1228.66	9.828	9.676
20	1294.24	17.208	82.176	1327.03	1273.02	19.045	18.914
21	1363.67	26.022	45.836	1375.25	1334.74	9.682	5.706
22	1394.53	24.666	55.655	1413.82	1377.17	12.254	8.319
23	1460.11	6.567	15.124	1467.83	1415.75	31.76	4.618
24	1487.12	0	0.926	1489.05	1483.26	773.7	761.609
25	1606.7	55.55	44.488	1651.07	1566.2	5.048	5.062
26	1753.29	84.456	14.966	1824.66	1689.64	3.578	3.244
27	2210.42	97.298	1.292	2262.5	2193.06	0.534	0.203
28	2362.8	95.679	3.855	2416.81	2308.79	1.046	0.826
29	2598.12	88.91	7.286	2640.55	2567.25	2.524	1.38
30	2713.84	85.242	14.447	2762.06	2677.2	2.73	2.637
31	2868.15	24.01	30.03	2883.58	2814.14	18.421	6.469
32	2954.95	0	0.382	2962.66	2953.02	1537.68	1512.984
33	3165.19	4.644	50.764	3442.94	3068.75	216.092	142.088

Date/Time; 6/24/2021 2:19:21 PM

No. of Scans;



No.	Peak	Intensity	Corr. Intensity	Base (H)	Base (L)	Area	Corr. Area
1	324.04	78.51	21.07	343.33	302.82	2.38	2.294
2	352.97	86.928	13.356	370.33	343.33	0.768	0.802
3	376.12	94.398	5.967	393.48	370.33	0.296	0.337
4	430.13	94.403	3.9	451.34	418.55	0.479	0.275
5	522.71	92.501	6.107	536.21	509.21	0.556	0.39
6	547.78	90.116	8.042	565.14	536.21	0.777	0.574
7	588.29	87.507	6.943	601.79	565.14	1.259	0.555
8	665.44	94.491	5.597	678.94	653.87	0.329	0.337
9	721.38	73.981	15.8	732.95	704.02	2.272	1.165
10	761.88	65.031	10.704	783.1	754.17	3.591	0.951
11	810.1	73.23	26.724	854.47	785.03	4.173	4.173
12	873.75	64.124	36.024	894.97	856.39	3.115	3.138
13	910.4	90.582	8.264	923.9	894.97	0.692	0.554
14	979.84	93.289	5.487	1002.98	956.69	0.907	0.658
15	1076.28	90.846	9.497	1097.5	1053.13	0.846	0.909
16	1116.78	82.01	18.19	1145.72	1099.43	1.817	1.858
17	1201.65	45.717	53.924	1226.73	1170.79	8.325	8.238
18	1256.66	65.24	17.755	1271.09	1228.66	4.872	2.155
19	1294.24	50.375	32.825	1328.95	1273.02	9.345	5.4
20	1363.67	65.716	25.987	1377.17	1344.38	3.275	2.231
21	1394.53	69.601	22.944	1413.82	1379.1	3.398	2.252
22	1460.11	42.311	10.03	1467.83	1415.75	11.043	2.011
23	1483.26	29.808	25.69	1537.27	1469.76	13.701	3.649
24	1604.77	83.426	16.418	1625.99	1573.91	1.538	1.493
25	1732.08	69.888	29.63	1799.59	1678.07	6.368	6.09
26	2364.73	98.046	0.797	2422.59	2351.23	0.275	0.056
27	2470.81	98.005	1.336	2501.67	2422.59	0.368	0.183
28	2601.97	97.102	2.843	2644.41	2542.18	0.66	0.634
29	2715.77	95.922	4.471	2762.06	2681.05	0.57	0.709
30	2856.58	63.76	21.65	2883.58	2812.21	7.205	3.307
31	2924.09	50.901	13.95	2941.44	2885.51	12.279	2.825
32	2958.8	50.545	19.341	3005.1	2943.37	9.354	2.831
33	3145.9	70.575	20.497	3361.93	3062.96	23.625	14.946

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No. of Scans;

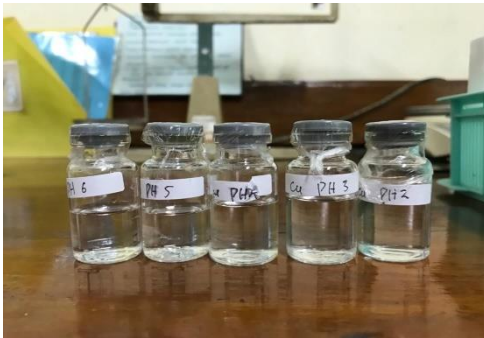
Lampiran 3. Dokumentasi Penelitian



Pembuatan larutan *p-t*-butilkaliks[6]arena dengan menimbang 0,0053 gram



Pembuatan larutan kerja Cu(II) 3×10^{-5} M



Cu(II) dengan *p-t*-butilkaliks[6]arena pada variasi pH 2-5



Cu(II) dengan *p-t*-butilkaliks[6]arena pada variasi waktu 20, 30, 40, 50, dan 60 menit





Cu(II) dengan *p-t*-butilkaliks[6]arena pada variasi waktu 20, 30, 40, 50, dan 60 menit



Larutan standar Cu(II)



Kristal Cu(II)-*p-t*-butilkaliks[6]arena



Spektrofotometri UV-Vis
(merk shimadzu UV-2600)



FT-IR
(merk shimadzu IRPrestige-21)