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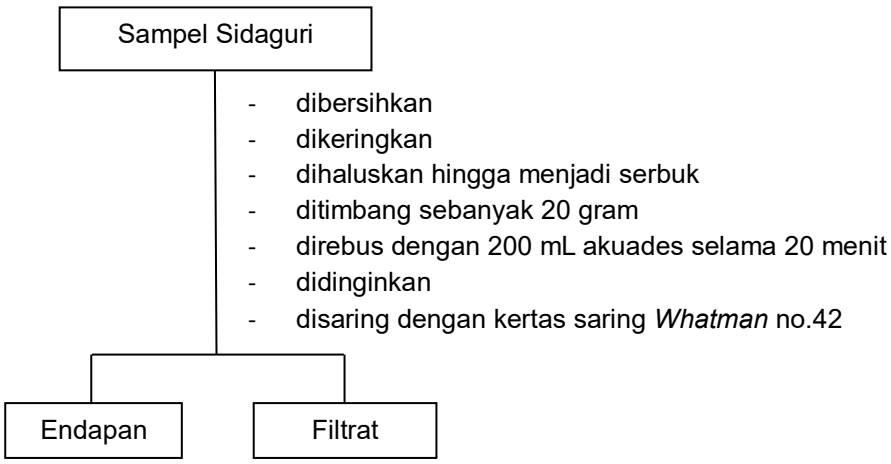
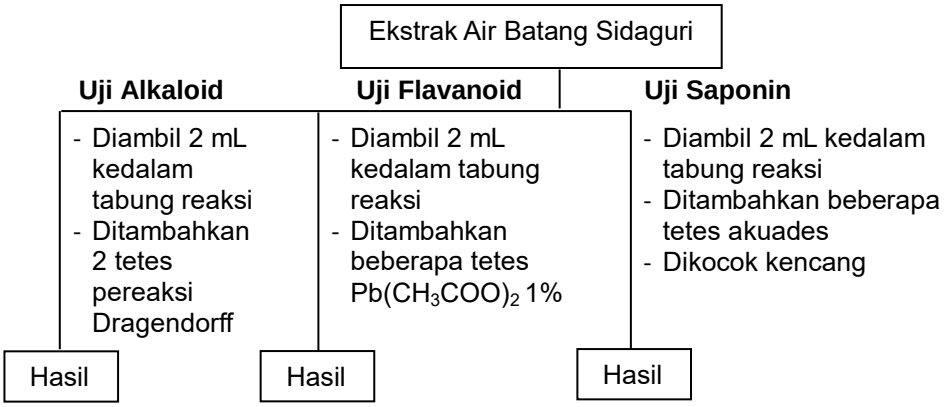
Lampiran 1. Bagan kerja preparasi sampel

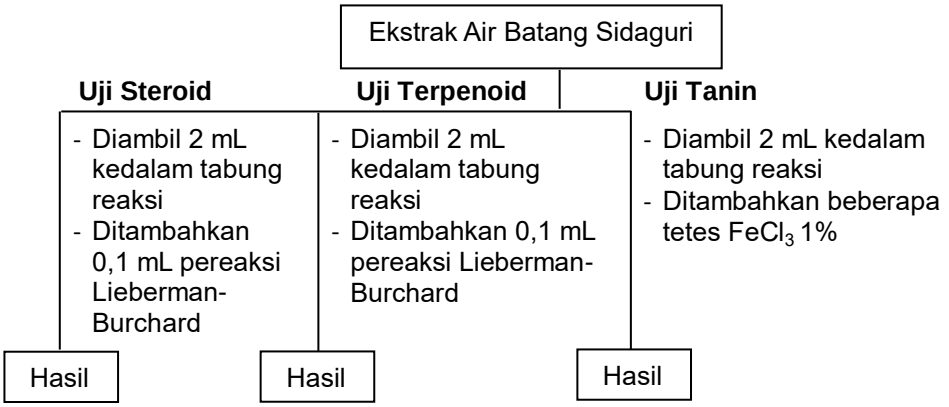


Lampiran 2. Bagan kerja uji fitokimia



Catatan:

1. Hasil positif uji alkaloid ditandai dengan terbentuknya endapan jingga hingga merah kecoklatan
2. Hasil positif flavonoid ditandai dengan terbentuknya endapan kuning
3. Hasil positif saponin ditandai dengan terbentuknya busa yang banyak

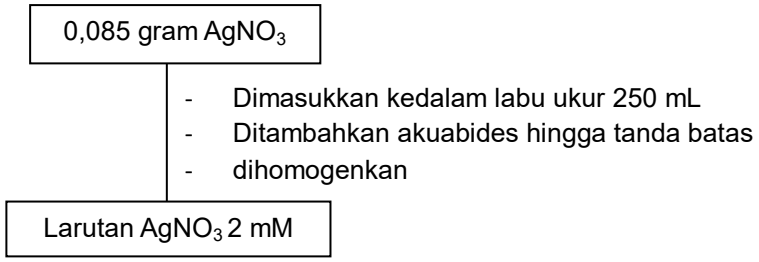


Catatan:

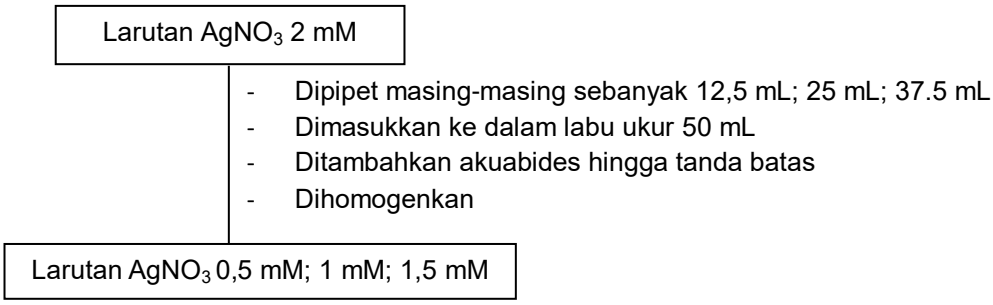
1. Hasil positif steroid ditandai dengan perubahan warna menjadi biru/hijau
2. Hasil positif terpenoid ditandai dengan terbentuknya warna ungu/merah
3. Hasil positif tanin ditandai dengan perubahan warna hijau kehitaman atau biru tua

Lampiran 3. Bagan kerja pembuatan larutan

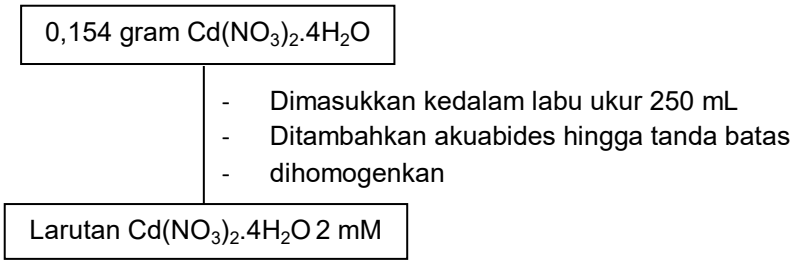
a. Pembuatan Larutan $AgNO_3$ 2 mM



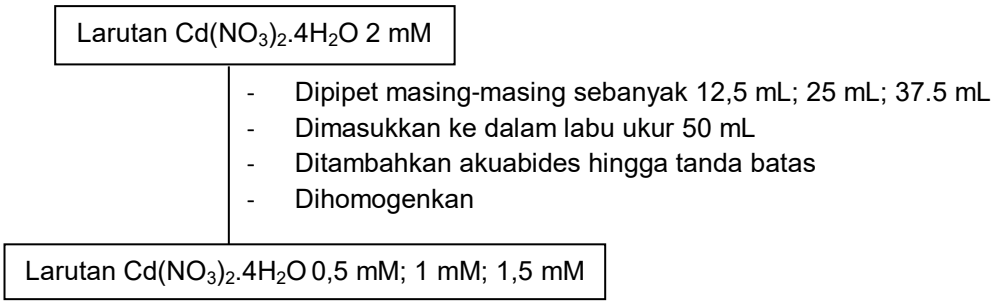
b. Pembuatan Larutan Standar $AgNO_3$ 0,5 mM; 1 mM; 1,5 mM



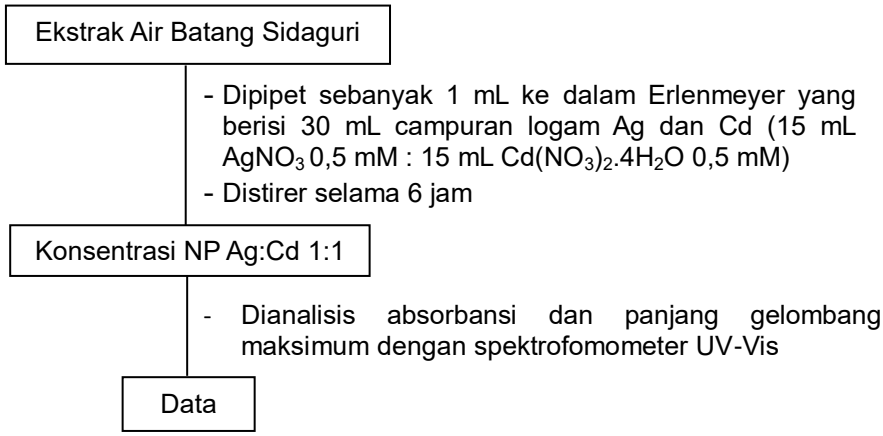
c. Pembuatan Larutan $Cd(NO_3)_2.4H_2O$ 2 mM



d. Pembuatan Larutan Standar $Cd(NO_3)_2.4H_2O$ 0,5 mM; 1 mM; 1,5 mM

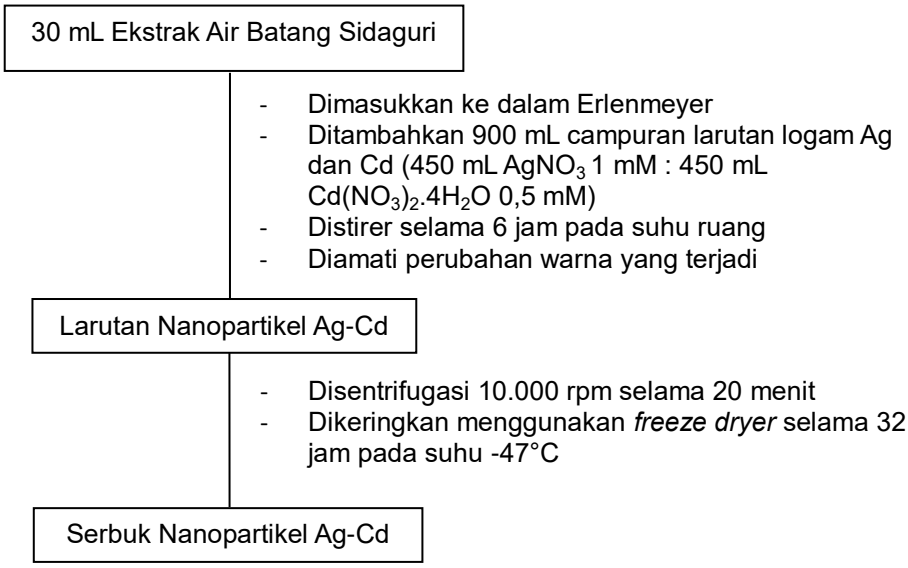


Lampiran 4. Bagan kerja optimasi konsentrasi logam

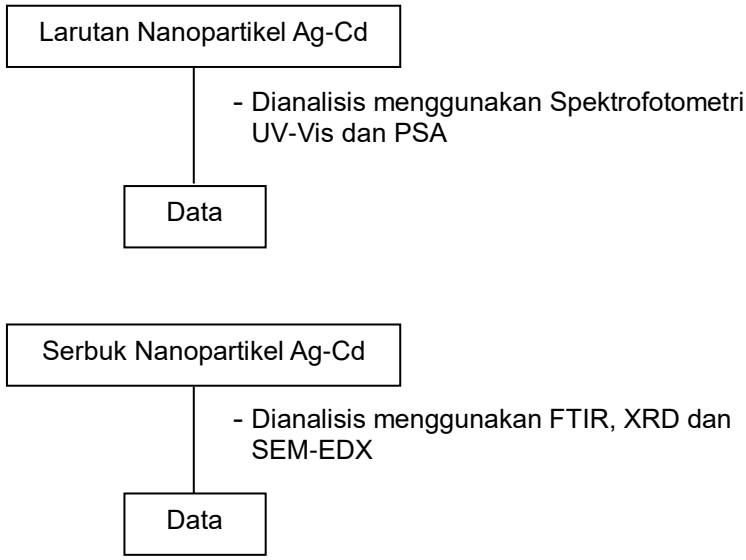


Catatan: Prosedur yang sama diulangi untuk perbandingan konsentrasi Ag:Cd yaitu 1:3 (0,5 mM : 1,5 mM), 1:4 (0,5 mm : 2 mM), 2:1 (1 mM : 0,5 mM) dan 3:2 (1,5 mM : 1 mM)

Lampiran 5. Bagan kerja sintesis nanopartikel Ag–Cd

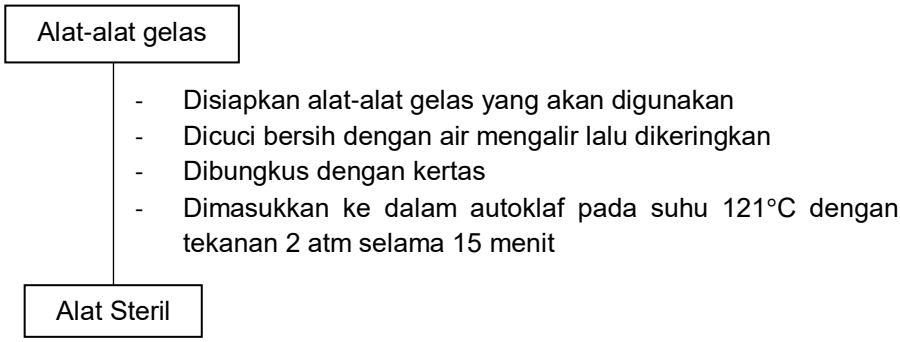


Lampiran 6. Bagan kerja karakterisasi nanopartikel bimetal Ag–Cd

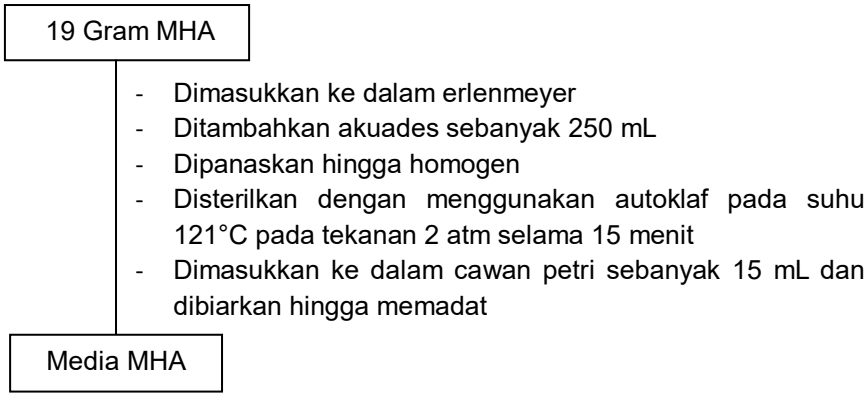


Lampiran 7. Bagan kerja uji bioaktifitas antibakteri

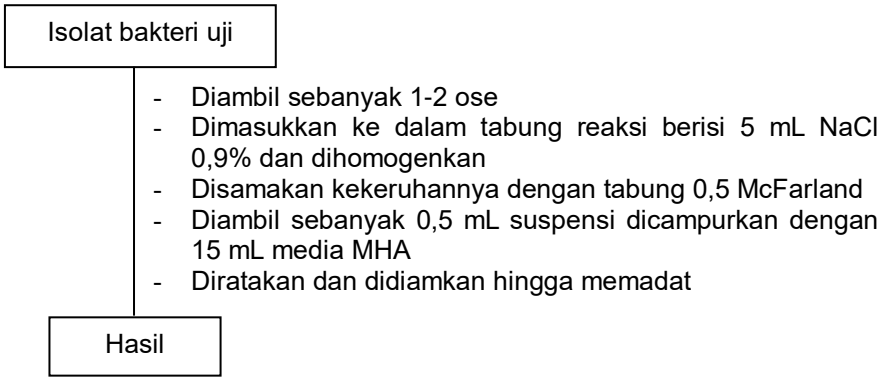
a) Sterilisasi Alat



b) Pembuatan Medium *Muller Hinton Agar* (MHA)



c) Persiapan Suspensi Bakteri Uji



Catatan : Isolat bakteri uji yang digunakan adalah bakteri *Escherichia coli* dan *Staphylococcus aureus*

d) Uji antibakteri

Media MHA

- Disiapkan sebanyak 6 *paper disc* berdiameter 6 mm
- Direndam 6 *paper disc* ke dalam 100 µL larutan nanopartikel Ag-Cd, kontrol positif (ampisilin 1%) dan kontrol negatif (akuabides)
- Ditunggu hingga larutan berdifusi ke dalam *paper disc*
- Diletakkan paper disc pada permukaan media secara aseptis dan diberi jarak tertentu agar tidak *overlapping*
- Diinkubasi pada suhu 37 °C selama 1 x 24 jam
- Diukur diameter daerah hambat antibakteri menggunakan jangka sorong

Hasil

Catatan : Bakteri uji yang digunakan adalah bakteri *Escherichia coli* dan *Staphylococcus aureus*

Lampiran 8. Perhitungan pembuatan larutan

a. Pembuatan Larutan $AgNO_3$ 2 mM

Massa (gram) = Mr x Volume (L) x Konsentrasi (M)

= 170 gr/mol x 0,25 L x 0,002 M

= 0,085 gram

b. Pembuatan Larutan Standar $AgNO_3$ 1,5 mM dalam 50 mL

$V_1 \times C_1 = V_2 \times C_2$

$$= \frac{V_2 \times C_2}{C_1}$$

$$= \frac{50 \text{ mL} \times 1{,}5 \text{ mM}}{2 \text{ mM}}$$

= 37,5 mL

c. Pembuatan Larutan Standar $AgNO_3$ 1 mM dalam 50 mL

$V_1 \times C_1 = V_2 \times C_2$

$$= \frac{V_2 \times C_2}{C_1}$$

$$= \frac{50 \text{ mL} \times 1 \text{ mM}}{2 \text{ mM}}$$

= 25 mL

d. Pembuatan Larutan Standar $AgNO_3$ 0,5 mM dalam 50 mL

$V_1 \times C_1 = V_2 \times C_2$

$$= \frac{V_2 \times C_2}{C_1}$$

$$= \frac{50 \text{ mL} \times 0{,}5 \text{ mM}}{2 \text{ mM}}$$

= 12,5 mL

e. Pembuatan Larutan $Cd(NO_3)_2.4H_2O$ 2 mM

Massa (gram) = Mr x Volume (L) x Konsentrasi (M)

= 308 gr/mol x 0,25 L x 0,002 M

= 0,154 gram

f. Pembuatan Larutan $Cd(NO_3)_2.4H_2O$ 1,5 mM dalam 50 mL

$$V_1 \times C_1 = V_2 \times C_2$$

$$= \frac{V_2 \times C_2}{C_1}$$

$$= \frac{50\ mL \times 1{,}5\ mM}{2\ mM}$$

$$= 37{,}5\ mL$$

g. Pembuatan Larutan $Cd(NO_3)_2.4H_2O$ 1 mM dalam 50 mL

$$V_1 \times C_1 = V_2 \times C_2$$

$$= \frac{V_2 \times C_2}{C_1}$$

$$= \frac{50\ mL \times 1\ mM}{2\ mM}$$

$$= 25\ mL$$

h. Pembuatan Larutan $Cd(NO_3)_2.4H_2O$ 0,5 mM dalam 50 mL

$$V_1 \times C_1 = V_2 \times C_2$$

$$= \frac{V_2 \times C_2}{C_1}$$

$$= \frac{50\ mL \times 0{,}5\ mM}{2\ mM}$$

$$= 12{,}5\ mL$$

i. Pembuatan Larutan Ampisilin 1%

$$\% = \frac{gram}{mL} \times 100\%$$

$$1\% = \frac{gram}{0{,}1\ mL} \times 100\%$$

$$= \frac{1\% \times 0{,}1\ mL}{100\%}$$

$$= 0{,}001\ gram$$

Lampiran 9. Perhitungan XRD

Persamaan Debye-Scherrer

$$D=\frac{K\,\lambda}{\beta\ \mathrm{Cos}\ \theta}$$

Keterangan:

D = Ukuran partikel (nm)
K = Faktor bentuk kristal (0,98)
λ = Panjang gelombang sinar-X (0,15405 nm)
β = Nilai FWHM (rad)
θ = Sudut Bragg/sudut difraksi (^{o})

1. Perhitungan D pada 2θ = 27,3900 → θ = 13,695

$$D = \frac{0{,}98 \times 0{,}15405}{0{,}00802 \times \mathrm{Cos}\ 13{,}695}$$

$$= \frac{0{,}150969}{0{,}00802 \times 0{,}97156}$$

$$= \frac{0{,}150969}{0{,}007791}$$

$$= 19{,}3773 \ \mathrm{nm}$$

2. Perhitungan D pada 2θ = 31,7971 → θ = 15,898

$$D = \frac{0{,}98 \times 0{,}15405}{0{,}00847 \times \mathrm{Cos}\ 15{,}898}$$

$$= \frac{0{,}150969}{0{,}00847 \times 0{,}96175}$$

$$= \frac{0{,}150969}{0{,}008146}$$

$$= 18{,}5328 \ \mathrm{nm}$$

3. Perhitungan D pada 2θ = 37,3400 → θ = 18,670

$$D = \frac{0{,}98 \times 0{,}15405}{0{,}01163 \times \mathrm{Cos}\ 18{,}670}$$

$$= \frac{0{,}150969}{0{,}00847 \times 0{,}94737}$$

$$= \frac{0{,}150969}{0{,}008024}$$

$$= 18{,}8146 \ \mathrm{nm}$$

4. Perhitungan D pada 2θ = 44,0573→ θ = 22,028

$$D = \frac{0,98 \times 0,15405}{0,00491 \times \text{Cos } 22,028}$$

$$= \frac{0,150969}{0,00491 \times 0,92700}$$

$$= \frac{0,150969}{0,004551}$$

$$= 33,1727 \text{ nm}$$

5. Perhitungan D pada 2θ = 45,7800→ θ = 22,890

$$D = \frac{0,98 \times 0,15405}{0,01117 \times \text{Cos } 22,890}$$

$$= \frac{0,150969}{0,01117 \times 0,92125}$$

$$= \frac{0,150969}{0,010290}$$

$$= 14,6714 \text{ nm}$$

6. Perhitungan D pada 2θ = 54,3450 → θ = 27,172

$$D = \frac{0,98 \times 0,15405}{0,00820 \times \text{Cos } 27,172}$$

$$= \frac{0,150969}{0,00820 \times 0,88963}$$

$$= \frac{0,150969}{0,007295}$$

$$= 20,6948 \text{ nm}$$

7. Perhitungan D pada 2θ = 57,0100 → θ = 28,505

$$D = \frac{0,98 \times 0,15405}{0,01012 \times \text{Cos } 28,505}$$

$$= \frac{0,150969}{0,01012 \times 0,87877}$$

$$= \frac{0,150969}{0,008893}$$

$$= 16,9761 \text{ nm}$$

8. Perhitungan D pada 2θ = 64,4358→ θ = 32,217

$$D = \frac{0,98 \times 0,15405}{0,00520 \times \text{Cos } 32,217}$$

$$= \frac{0,150969}{0,00520 \times 0,84603}$$

$$= \frac{0,150969}{0,004399}$$

$$= 34,3189 \text{ nm}$$

9. Perhitungan D pada 2θ = 77,5441→ θ = 38,772

$$D = \frac{0,98 \times 0,15405}{0,00544 \times \text{Cos } 38,772}$$

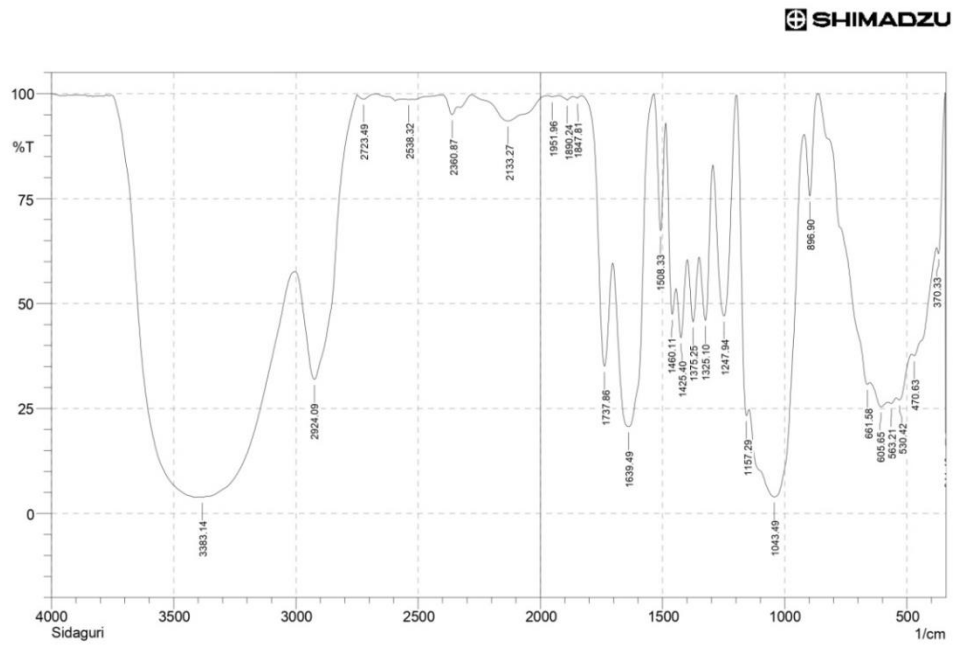
$$= \frac{0,150969}{0,00544 \times 0,77964}$$

$$= \frac{0,150969}{0,004241}$$

$$= 35,5975 \text{ nm}$$

Lampiran 10. Hasil karakterisasi dengan FTIR

1. Ekstrak air batang sidaguri

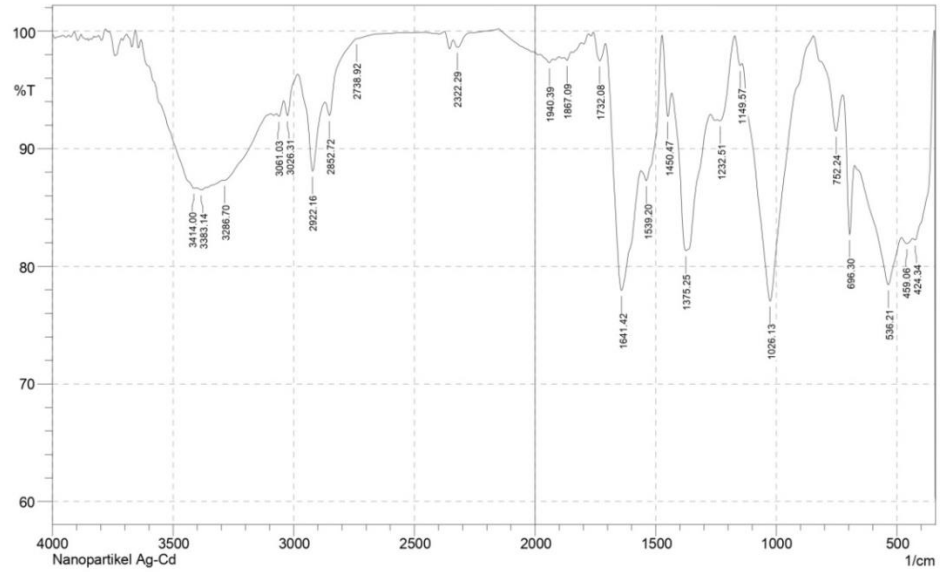


No.	Peak	Intensity	Corr. Intensity	Base (H)	Base (L)	Area	Corr. Area
1	341.4	19.172	40.557	343.33	339.47	2.763	0.695
2	370.33	61.901	9.796	378.05	345.26	4.112	0.992
3	470.63	37.588	2.787	480.28	379.98	33.783	2.94
4	530.42	27.005	2.76	543.93	482.2	31.207	1.138
5	563.21	26.215	0.704	576.72	545.85	17.732	0.186
6	605.65	25.384	2.869	650.01	578.64	40.239	1.517
7	661.58	30.765	3.533	864.11	651.94	46.554	0.618
8	896.9	75.615	18.823	920.05	866.04	3.252	2.1
9	1043.49	3.954	50.715	1145.72	921.97	190.926	118.743
10	1157.29	23.346	15.77	1197.79	1147.65	17.679	2.811
11	1247.94	47.013	43.74	1292.31	1199.72	18.168	14.327
12	1325.1	46.005	24.883	1350.17	1294.24	13.103	4.982
13	1375.25	45.638	15.022	1398.39	1352.1	12.891	2.844
14	1425.4	41.89	14.573	1444.68	1400.32	13.633	2.785
15	1460.11	47.429	19.162	1487.12	1446.61	9.053	2.701
16	1508.33	67.351	28.23	1535.34	1489.05	4.082	3.255
17	1639.49	20.674	54.403	1703.14	1537.27	65.578	47.198
18	1737.86	35.036	34.987	1830.45	1705.07	22.649	10.081
19	1847.81	98.917	0.515	1867.09	1830.45	0.122	0.031
20	1890.24	98.437	0.979	1924.96	1867.09	0.238	0.097
21	1951.96	99.298	0.249	1973.18	1924.96	0.122	0.027
22	2133.27	93.474	6.165	2279.86	1973.18	4.666	4.177
23	2360.87	95	2.87	2401.38	2337.72	0.811	0.322
24	2538.32	98.601	0.065	2561.47	2524.82	0.218	0.005
25	2723.49	98.722	1.066	2750.49	2673.34	0.229	0.172
26	2924.09	31.919	39.089	3005.1	2750.49	66.986	36.585
27	3383.14	3.908	1.384	3392.79	3007.02	322.857	17.435

Comment;
Sidaguri

Date/Time; 10/6/2023 2:03:33 PM
No. of Scans;
Resolution;
Apodization;

2. Nanopartikel bimetal Ag–Cd



	Peak	Intensity	Corr. Intensity	Base (H)	Base (L)	Area	Corr. Area
1	424.34	82.237	2.042	433.98	345.26	5.602	1.954
2	459.06	81.923	0.48	480.28	435.91	3.794	0.064
3	536.21	78.429	5.729	675.09	482.2	15.54	2.349
4	696.3	82.697	8.349	723.31	677.01	2.638	0.828
5	752.24	91.49	4.207	844.82	725.23	2.429	0.843
6	1026.13	77.042	21.126	1141.86	846.75	14.576	12.54
7	1149.57	97.083	0.749	1172.72	1141.86	0.269	0.055
8	1232.51	92.381	1.263	1244.09	1174.65	1.554	0.338
9	1375.25	81.324	12.737	1433.11	1274.95	9.13	4.735
10	1450.47	92.756	4.08	1473.62	1433.11	0.866	0.359
11	1539.2	87.286	3.661	1560.41	1473.62	3.748	1.354
12	1641.42	77.954	16.051	1707	1562.34	10.349	5.974
13	1732.08	97.482	1.912	1759.08	1708.93	0.358	0.234
14	1867.09	97.507	0.44	1880.6	1847.81	0.314	0.025
15	1940.39	97.315	0.417	1978.97	1924.96	0.563	0.045
16	2322.29	98.625	0.775	2339.65	2270.22	0.235	0.101
17	2738.92	99.353	0.028	2742.78	2661.77	0.159	0.003
18	2852.72	92.834	1.852	2870.08	2742.78	1.787	0.168
19	2922.16	88.094	6.933	2981.95	2872.01	3.812	1.415
20	3026.31	92.817	1.862	3041.74	2983.88	1.386	0.163
21	3061.03	92.762	0.624	3072.6	3041.74	0.945	0.047
22	3286.7	87.318	0.115	3290.56	3095.75	8.926	0.209
23	3383.14	86.495	0.275	3400.5	3292.49	6.607	0.074
24	3414	86.632	0.67	3631.96	3402.43	8.543	0.977

Comment;
Nanopartikel Ag-Cd

Date/Time; 11/13/2023 9:02:25 AM
No. of Scans;
Resolution;
Apodization;

Lampiran 11. Hasil karakterisasi dengan XRD

*** Basic Data Process ***

Group : Standard
Data : ag#cd

Strongest 3 peaks

no.	peak no.	2Theta (deg)	d (A)	I/I1	FWHM (deg)	Intensity (Counts)	Integrated Int (Counts)
1	6	31.7971	2.81198	100	0.48570	168	4227
2	30	77.5441	1.23007	65	0.31170	110	1866
3	23	64.4358	1.44483	59	0.29830	99	1578

Peak Data List

peak no.	2Theta (deg)	d (A)	I/I1	FWHM (deg)	Intensity (Counts)	Integrated Int (Counts)
1	26.5800	3.35088	3	0.20000	5	72
2	26.9800	3.30210	13	0.32000	22	412
3	27.3900	3.25360	47	0.46000	79	1615
4	27.8600	3.19977	5	0.24000	8	206
5	31.1200	2.87160	8	0.28000	13	448
6	31.7971	2.81198	100	0.48570	168	4227
7	32.5200	2.75111	8	0.34000	13	465
8	36.6150	2.45227	5	0.15000	9	79
9	37.3400	2.40631	10	0.66660	16	691
10	37.7600	2.38050	17	0.00000	28	0
11	38.1600	2.35646	10	0.60000	17	713
12	38.8000	2.31906	4	0.16000	6	110
13	43.3900	2.08377	4	0.18000	6	88
14	44.0573	2.05375	56	0.28180	94	1352
15	45.0400	2.01120	4	0.08000	7	48
16	45.7800	1.98039	44	0.64000	74	2559
17	53.7600	1.70374	3	0.16000	5	59
18	54.3450	1.68677	12	0.47000	20	484
19	54.9000	1.67103	3	0.28000	5	128
20	56.5200	1.62691	3	0.20000	5	89
21	57.0100	1.61409	14	0.58000	24	714
22	63.7600	1.45851	3	0.20000	5	104
23	64.4358	1.44483	59	0.29830	99	1578
24	67.0000	1.39563	5	0.36000	8	195
25	67.3650	1.38895	4	0.25000	6	95
26	73.9200	1.28115	4	0.24000	7	146
27	74.3600	1.27465	3	0.04000	5	24
28	76.1800	1.24867	10	0.36000	16	307
29	76.5200	1.24396	8	0.64000	13	423
30	77.5441	1.23007	65	0.31170	110	1866

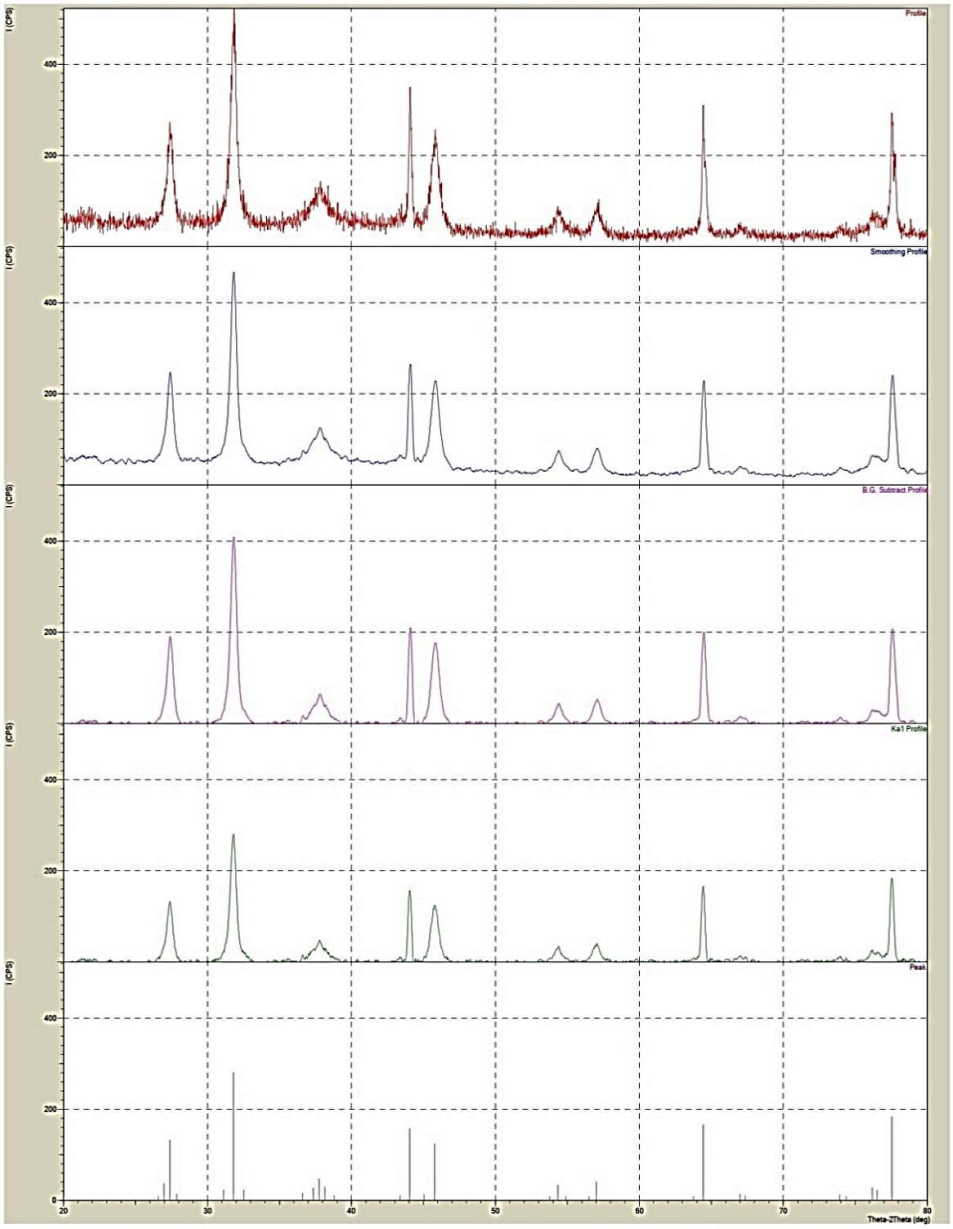
```
        ***  Basic Data Process  ***

# Data Infomation
          Group               : Standard
          Data                : ag#cd
          Sample Nmae         : powder
          Comment             :
          Date & Time         : 01-19-24 10:39:05

# Measurement Condition
    X-ray tube
          target              : Cu
          voltage             : 40.0 (kV)
          current             : 30.0 (mA)
    Slits
          Auto Slit           : not Used
          divergence slit     :   1.00000 (deg)
          scatter slit        :   1.00000 (deg)
          receiving slit      :   0.30000(mm)
    Scanning
          drive axis          : Theta-2Theta
          scan range          :   20.0000 - 80.0000 (deg)
          scan mode           : Continuous Scan
          scan speed          :    2.0000 (deg/min)
          sampling pitch      :    0.0200 (deg)
          preset time         :    0.60 (sec)

# Data Process Condition
    Smoothing                 [ AUTO ]
          smoothing points    : 25
    B.G.Subtruction           [ AUTO ]
          sampling points     : 29
          repeat times        : 30
    Ka1-a2 Separate           [ MANUAL ]
          Ka1 a2 ratio        : 50 (%)
    Peak Search               [ AUTO ]
          differential points : 25
          FWHM threhold       : 0.050 (deg)
          intensity threhold  : 30 (par mil)
          FWHM ratio  (n-1)/n : 2
    System error Correction   [ NO ]
    Precise peak Correction   [ NO ]
```

< Group: Standard Data: ag#cd >



Lampiran 12. Hasil karakterisasi dengan PSA

HORIBA Scientific

HORIBA SZ-100 for Windows [Z Type] Ver2.20

SZ-100

Nanopartikel Ag-Cd_0119.nsz

Measurement Results

Date	: 18 October 2023 14:28:33
Measurement Type	: Particle Size
Sample Name	: Nanopartikel Ag-Cd
Scattering Angle	: 90
Temperature of the Holder	: 25.0 deg. C
Dispersion Medium Viscosity	: 0.895 mPa.s
Transmission Intensity before Meas.	: 17526
Distribution Form	: |Standard|
Distribution Form(Dispersity)	: Polydisperse
Representation of Result	: Scattering Light Intensity
Count Rate	: 467 kCPS

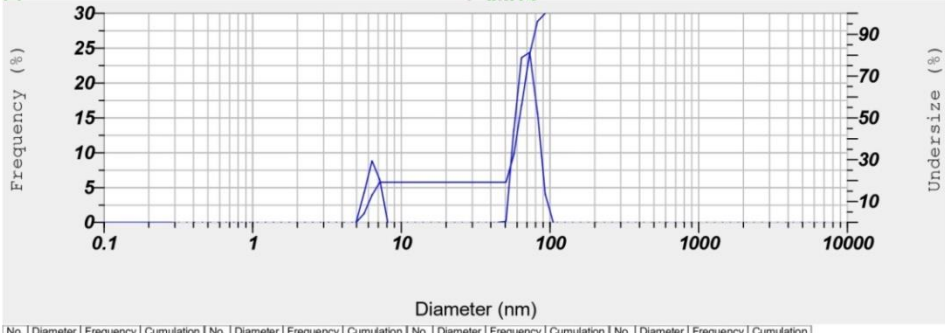
Calculation Results

Peak No.	S.P.Area Ratio	Mean	S. D.	Mode
1	0.19	6.1 nm	0.5 nm	6.0 nm
2	0.81	66.5 nm	9.1 nm	67.2 nm
3	---	--- nm	--- nm	--- nm
Total	1.00	55.0 nm	25.1 nm	67.2 nm

Cumulant Operations

Z-Average : 44.7 nm

PI : 0.514



No.	Diameter	Frequency	Cumulation	No.	Diameter	Frequency	Cumulation	No.	Diameter	Frequency	Cumulation	No.	Diameter	Frequency	Cumulation
1	0.34	0.000	0.000	22	4.40	0.000	0.000	43	57.09	13.173	32.327	64	740.89	0.000	100.000
2	0.38	0.000	0.000	23	4.97	0.000	0.000	44	64.50	23.618	55.945	65	837.07	0.000	100.000
3	0.43	0.000	0.000	24	5.61	4.207	4.207	45	72.87	24.353	80.298	66	945.74	0.000	100.000
4	0.49	0.000	0.000	25	6.34	8.789	12.996	46	82.33	15.738	96.036	67	1068.52	0.000	100.000
5	0.55	0.000	0.000	26	7.17	6.064	19.060	47	93.02	3.964	100.000	68	1207.24	0.000	100.000
6	0.62	0.000	0.000	27	8.10	0.000	19.060	48	105.10	0.000	100.000	69	1363.97	0.000	100.000
7	0.70	0.000	0.000	28	9.15	0.000	19.060	49	118.74	0.000	100.000	70	1541.04	0.000	100.000
8	0.80	0.000	0.000	29	10.34	0.000	19.060	50	134.16	0.000	100.000	71	1741.10	0.000	100.000
9	0.90	0.000	0.000	30	11.68	0.000	19.060	51	151.57	0.000	100.000	72	1967.14	0.000	100.000
10	1.02	0.000	0.000	31	13.20	0.000	19.060	52	171.25	0.000	100.000	73	2222.51	0.000	100.000
11	1.15	0.000	0.000	32	14.91	0.000	19.060	53	193.48	0.000	100.000	74	2511.05	0.000	100.000
12	1.30	0.000	0.000	33	16.84	0.000	19.060	54	218.60	0.000	100.000	75	2837.04	0.000	100.000
13	1.47	0.000	0.000	34	19.03	0.000	19.060	55	246.98	0.000	100.000	76	3205.35	0.000	100.000
14	1.66	0.000	0.000	35	21.50	0.000	19.060	56	279.04	0.000	100.000	77	3621.48	0.000	100.000
15	1.87	0.000	0.000	36	24.29	0.000	19.060	57	315.27	0.000	100.000	78	4091.63	0.000	100.000
16	2.11	0.000	0.000	37	27.45	0.000	19.060	58	356.20	0.000	100.000	79	4622.81	0.000	100.000
17	2.39	0.000	0.000	38	31.01	0.000	19.060	59	402.44	0.000	100.000	80	5222.96	0.000	100.000
18	2.70	0.000	0.000	39	35.03	0.000	19.060	60	454.69	0.000	100.000	81	5901.02	0.000	100.000
19	3.05	0.000	0.000	40	39.58	0.000	19.060	61	513.71	0.000	100.000	82	6667.10	0.000	100.000
20	3.45	0.000	0.000	41	44.72	0.000	19.060	62	580.41	0.000	100.000	83	7532.65	0.000	100.000
21	3.89	0.000	0.000	42	50.53	0.094	19.154	63	655.76	0.000	100.000	84	8510.56	0.000	100.000

HORIBA Scientific

HORIBA SZ-100 for Windows [Z Type] Ver2.20

SZ-100

Nanopartikel Ag-Cd_0122.nsz

Measurement Results

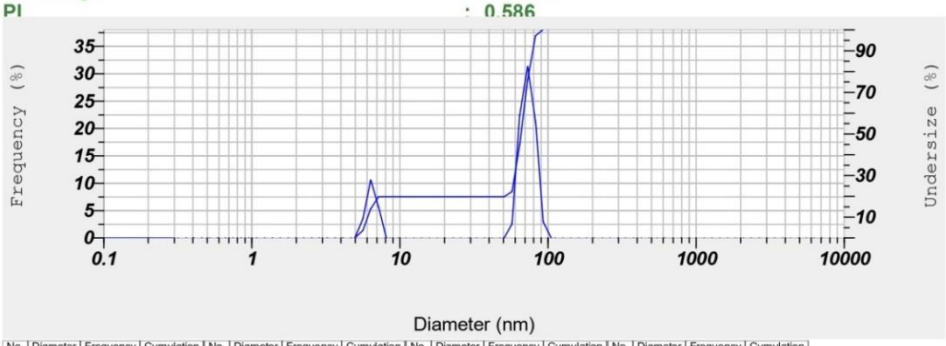
Date	: 18 October 2023 14:31:30
Measurement Type	: Particle Size
Sample Name	: Nanopartikel Ag-Cd
Scattering Angle	: 90
Temperature of the Holder	: 24.8 deg. C
Dispersion Medium Viscosity	: 0.898 mPa.s
Transmission Intensity before Meas.	: 17526
Distribution Form	: |Standard|
Distribution Form(Dispersity)	: Polydisperse
Representation of Result	: Scattering Light Intensity
Count Rate	: 394 kCPS

Calculation Results

Peak No.	S.P.Area Ratio	Mean	S. D.	Mode
1	0.20	6.1 nm	0.5 nm	6.0 nm
2	0.80	68.9 nm	7.6 nm	68.4 nm
3	---	--- nm	--- nm	--- nm
Total	1.00	56.6 nm	25.9 nm	68.4 nm

Cumulant Operations

Z-Average	: 44.5 nm
PI	: 0.586



No.	Diameter	Frequency	Cumulation	No.	Diameter	Frequency	Cumulation	No.	Diameter	Frequency	Cumulation	No.	Diameter	Frequency	Cumulation
1	0.34	0.000	0.000	22	4.40	0.000	0.000	43	57.09	2.528	22.202	64	740.89	0.000	100.000
2	0.38	0.000	0.000	23	4.97	0.000	0.000	44	64.50	22.422	44.624	65	837.07	0.000	100.000
3	0.43	0.000	0.000	24	5.61	3.430	3.430	45	72.87	31.287	75.911	66	945.74	0.000	100.000
4	0.49	0.000	0.000	25	6.34	10.564	13.994	46	82.33	21.234	97.145	67	1068.52	0.000	100.000
5	0.55	0.000	0.000	26	7.17	5.681	19.674	47	93.02	2.855	100.000	68	1207.24	0.000	100.000
6	0.62	0.000	0.000	27	8.10	0.000	19.674	48	105.10	0.000	100.000	69	1363.97	0.000	100.000
7	0.70	0.000	0.000	28	9.15	0.000	19.674	49	118.74	0.000	100.000	70	1541.04	0.000	100.000
8	0.80	0.000	0.000	29	10.34	0.000	19.674	50	134.16	0.000	100.000	71	1741.10	0.000	100.000
9	0.90	0.000	0.000	30	11.68	0.000	19.674	51	151.57	0.000	100.000	72	1967.14	0.000	100.000
10	1.02	0.000	0.000	31	13.20	0.000	19.674	52	171.25	0.000	100.000	73	2222.51	0.000	100.000
11	1.15	0.000	0.000	32	14.91	0.000	19.674	53	193.48	0.000	100.000	74	2511.05	0.000	100.000
12	1.30	0.000	0.000	33	16.84	0.000	19.674	54	218.60	0.000	100.000	75	2837.04	0.000	100.000
13	1.47	0.000	0.000	34	19.03	0.000	19.674	55	246.98	0.000	100.000	76	3205.35	0.000	100.000
14	1.66	0.000	0.000	35	21.50	0.000	19.674	56	279.04	0.000	100.000	77	3621.48	0.000	100.000
15	1.87	0.000	0.000	36	24.29	0.000	19.674	57	315.27	0.000	100.000	78	4091.63	0.000	100.000
16	2.11	0.000	0.000	37	27.45	0.000	19.674	58	356.20	0.000	100.000	79	4622.81	0.000	100.000
17	2.39	0.000	0.000	38	31.01	0.000	19.674	59	402.44	0.000	100.000	80	5222.96	0.000	100.000
18	2.70	0.000	0.000	39	35.03	0.000	19.674	60	454.69	0.000	100.000	81	5901.02	0.000	100.000
19	3.05	0.000	0.000	40	39.58	0.000	19.674	61	513.71	0.000	100.000	82	6667.10	0.000	100.000
20	3.45	0.000	0.000	41	44.72	0.000	19.674	62	580.41	0.000	100.000	83	7532.65	0.000	100.000
21	3.89	0.000	0.000	42	50.53	0.000	19.674	63	655.76	0.000	100.000	84	8510.56	0.000	100.000

HORIBA Scientific

HORIBA SZ-100 for Windows [Z Type] Ver2.20

SZ-100

Nanopartikel Ag-Cd_0123.nsz

Measurement Results

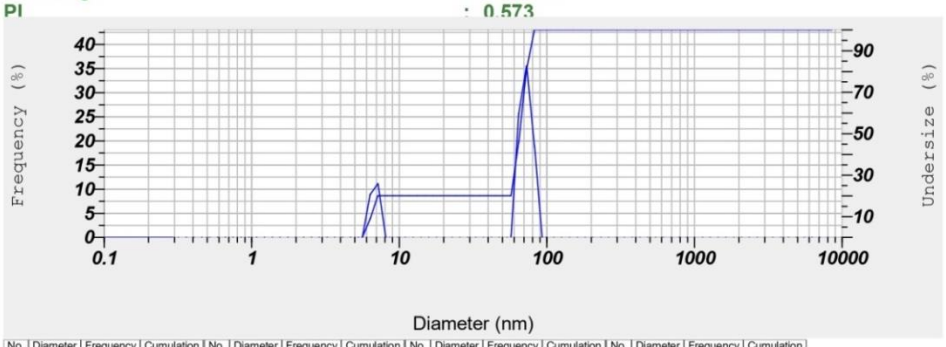
Date	: 18 October 2023 14:32:39
Measurement Type	: Particle Size
Sample Name	: Nanopartikel Ag-Cd
Scattering Angle	: 90
Temperature of the Holder	: 25.0 deg. C
Dispersion Medium Viscosity	: 0.896 mPa.s
Transmission Intensity before Meas.	: 17526
Distribution Form	: |Standard|
Distribution Form(Dispersity)	: Polydisperse
Representation of Result	: Scattering Light Intensity
Count Rate	: 401 kCPS

Calculation Results

Peak No.	S.P.Area Ratio	Mean	S. D.	Mode
1	0.20	6.4 nm	0.4 nm	6.4 nm
2	0.80	68.1 nm	6.2 nm	67.8 nm
3	---	--- nm	--- nm	--- nm
Total	1.00	55.8 nm	25.3 nm	67.8 nm

Cumulant Operations

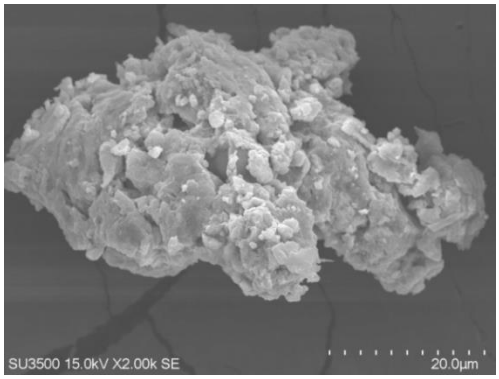
Z-Average	: 43.8 nm
PI	: 0.573

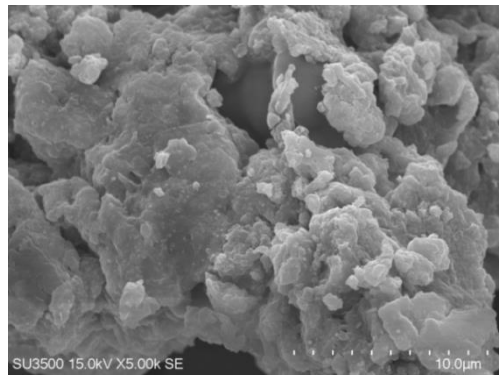


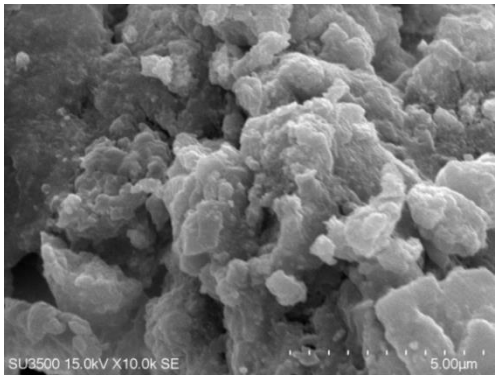
No.	Diameter	Frequency	Cumulation	No.	Diameter	Frequency	Cumulation	No.	Diameter	Frequency	Cumulation	No.	Diameter	Frequency	Cumulation
1	0.34	0.000	0.000	22	4.40	0.000	0.000	43	57.09	0.000	19.997	64	740.89	0.000	100.000
2	0.38	0.000	0.000	23	4.97	0.000	0.000	44	64.50	25.587	45.584	65	837.07	0.000	100.000
3	0.43	0.000	0.000	24	5.61	0.000	0.000	45	72.87	35.546	81.129	66	945.74	0.000	100.000
4	0.49	0.000	0.000	25	6.34	8.863	8.863	46	82.33	18.871	100.000	67	1068.52	0.000	100.000
5	0.55	0.000	0.000	26	7.17	11.134	19.997	47	93.02	0.000	100.000	68	1207.24	0.000	100.000
6	0.62	0.000	0.000	27	8.10	0.000	19.997	48	105.10	0.000	100.000	69	1363.97	0.000	100.000
7	0.70	0.000	0.000	28	9.15	0.000	19.997	49	118.74	0.000	100.000	70	1541.04	0.000	100.000
8	0.80	0.000	0.000	29	10.34	0.000	19.997	50	134.16	0.000	100.000	71	1741.10	0.000	100.000
9	0.90	0.000	0.000	30	11.68	0.000	19.997	51	151.57	0.000	100.000	72	1967.14	0.000	100.000
10	1.02	0.000	0.000	31	13.20	0.000	19.997	52	171.25	0.000	100.000	73	2222.51	0.000	100.000
11	1.15	0.000	0.000	32	14.91	0.000	19.997	53	193.48	0.000	100.000	74	2511.05	0.000	100.000
12	1.30	0.000	0.000	33	16.84	0.000	19.997	54	218.60	0.000	100.000	75	2837.04	0.000	100.000
13	1.47	0.000	0.000	34	19.03	0.000	19.997	55	246.98	0.000	100.000	76	3205.35	0.000	100.000
14	1.66	0.000	0.000	35	21.50	0.000	19.997	56	279.04	0.000	100.000	77	3621.48	0.000	100.000
15	1.87	0.000	0.000	36	24.29	0.000	19.997	57	315.27	0.000	100.000	78	4091.63	0.000	100.000
16	2.11	0.000	0.000	37	27.45	0.000	19.997	58	356.20	0.000	100.000	79	4622.81	0.000	100.000
17	2.39	0.000	0.000	38	31.01	0.000	19.997	59	402.44	0.000	100.000	80	5222.96	0.000	100.000
18	2.70	0.000	0.000	39	35.03	0.000	19.997	60	454.69	0.000	100.000	81	5901.02	0.000	100.000
19	3.05	0.000	0.000	40	39.58	0.000	19.997	61	513.71	0.000	100.000	82	6667.10	0.000	100.000
20	3.45	0.000	0.000	41	44.72	0.000	19.997	62	580.41	0.000	100.000	83	7532.65	0.000	100.000
21	3.89	0.000	0.000	42	50.53	0.000	19.997	63	655.76	0.000	100.000	84	8510.56	0.000	100.000

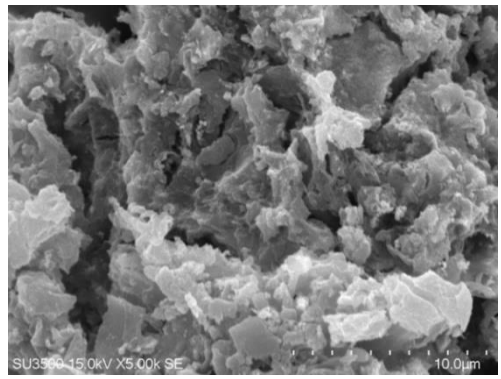
Lampiran 13. Hasil karakterisasi dengan SEM-EDX

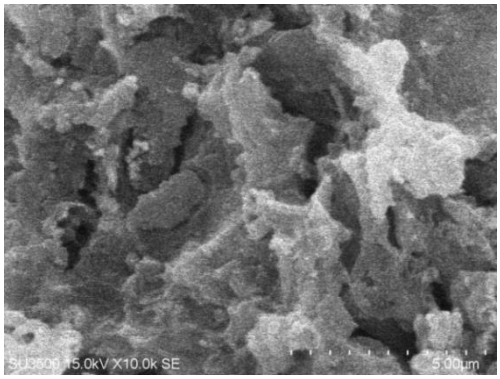
1. Hasil SEM

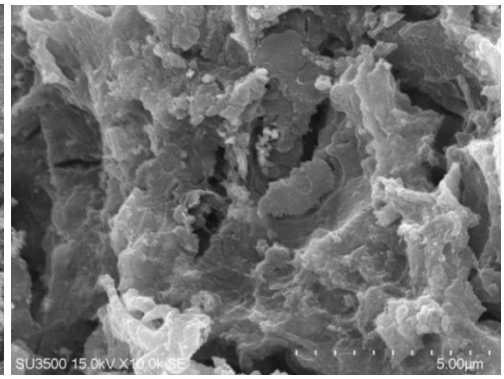


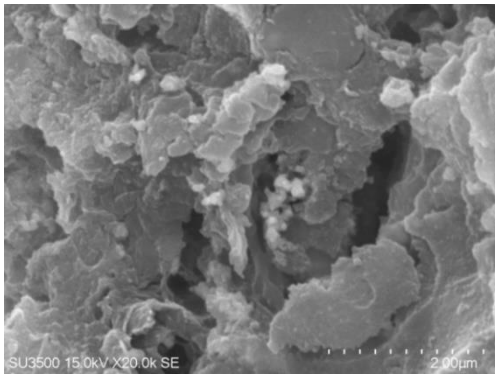


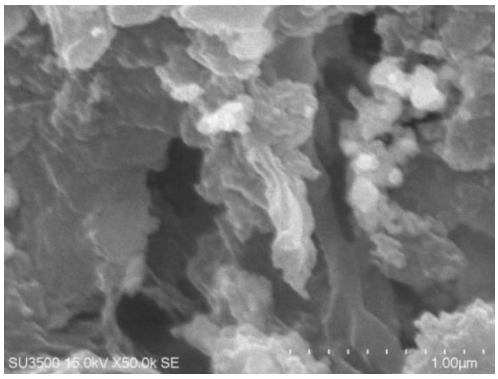


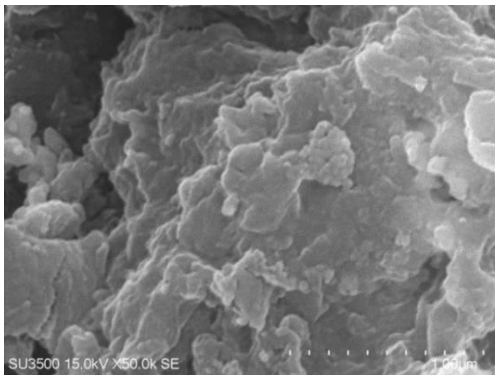


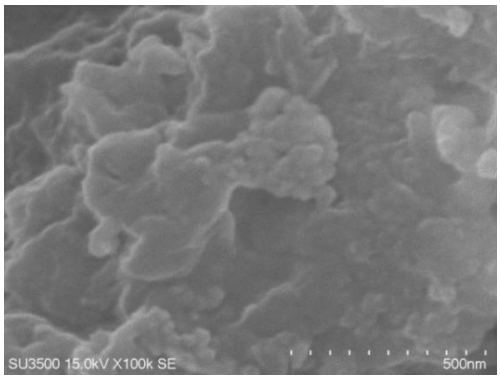


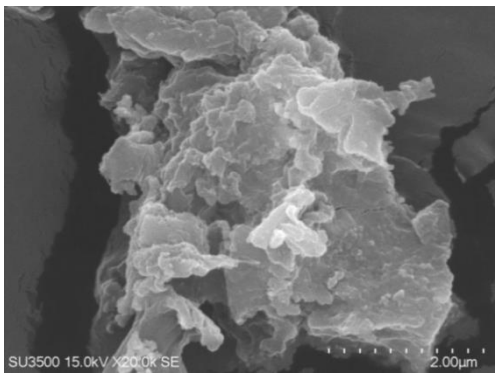


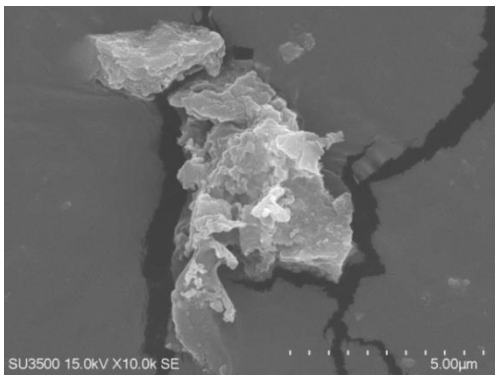

SU3500 15.0kV X20.0k SE
2.00µm

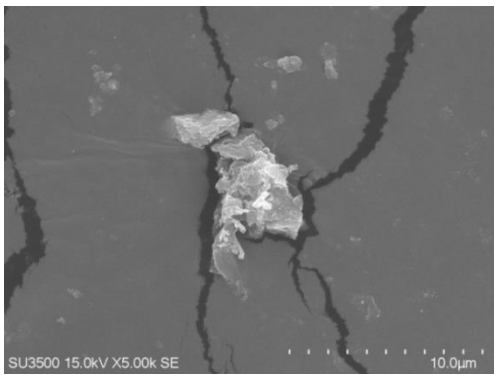

SU3500 15.0kV X50.0k SE
1.00µm

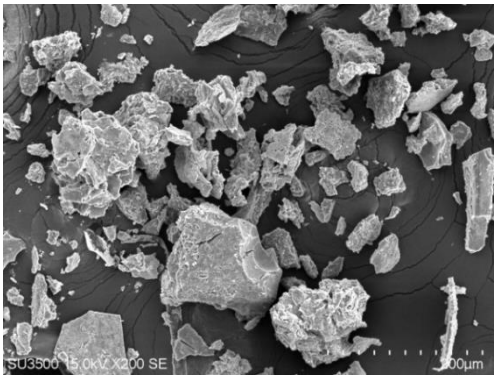

SU3500 15.0kV X50.0k SE


SU3500 15.0kV X100k SE
500nm


SU3500 15.0kV X20.0k SE
2.00µm


SU3500 15.0kV X10.0k SE
5.00µm


SU3500 15.0kV X5.00k SE
10.0µm


SU3500 15.0kV X200 SE

2. Hasil EDX *mapping*

EDAX TEAM

Page 1

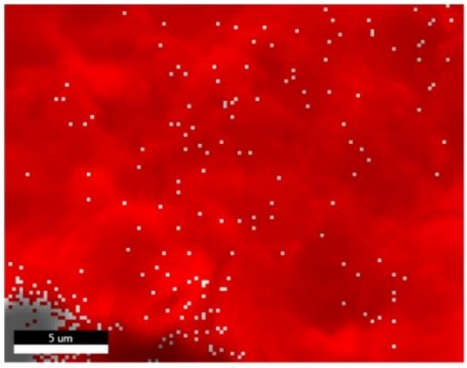
2023

Author: Gita
Creation: 11/21/2023 4:57:41 AM

Sample Name: New Sample

Area 361

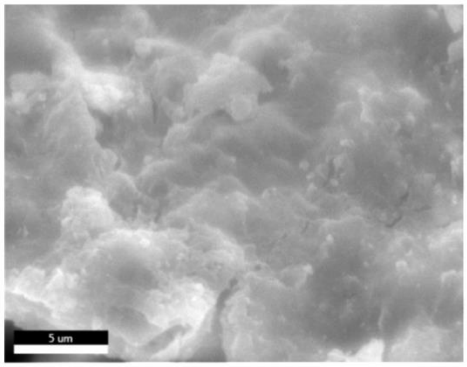
Live Map 1



4% Unallocated (454 Pixels)

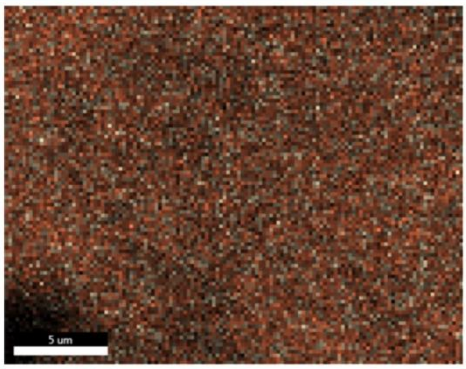
96% AgL/CdL (12346 Pixels)

Notes:



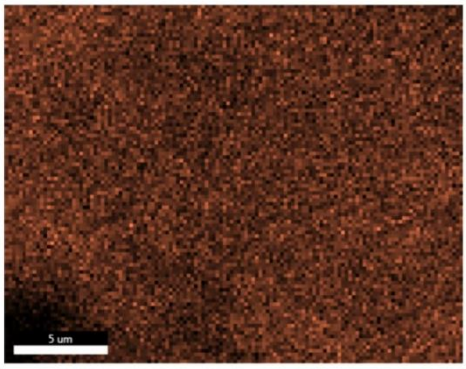
Image

ElementOverlay

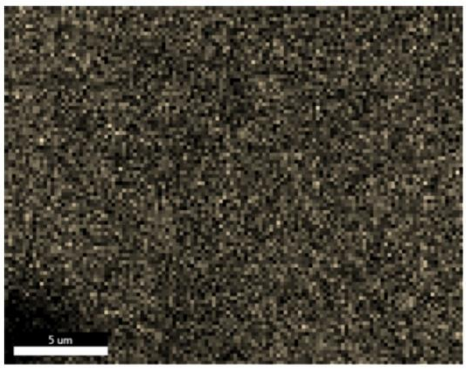


67% AgL

33% CdL



AgL_ROI (26)

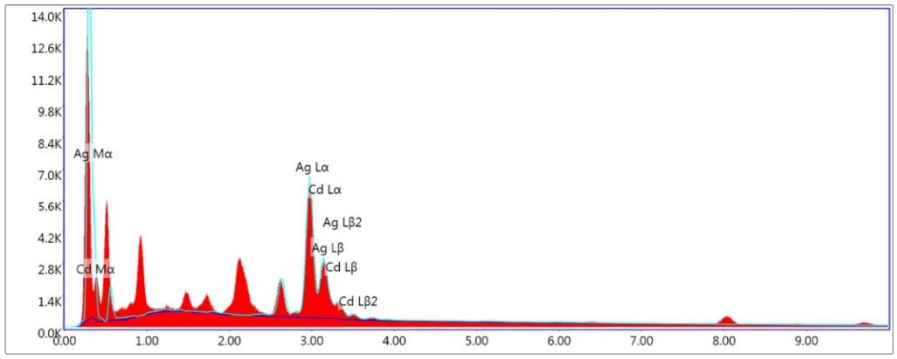


CdL_ROI (17)

EDAX TEAM

kV: 15 Mag: 5000 Takeoff: 87.5 Live Time(s): 81.9 Amp Time(µs): 0.48 Resolution:(eV) 129.7

Sum Spectrum



Lsec: 81.9 0 Cnts 0.000 keV Det: Octane Pro A

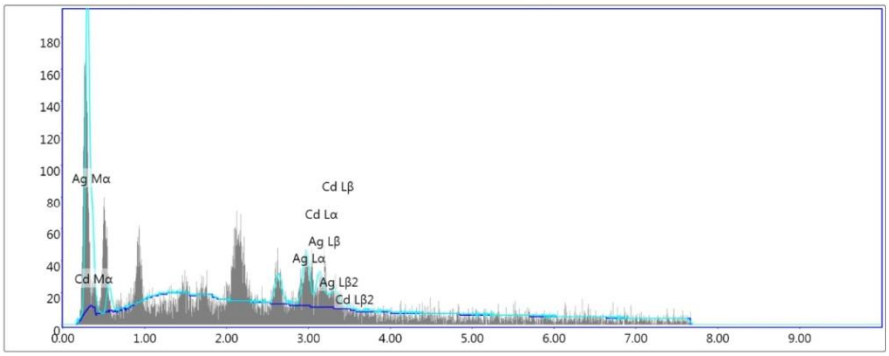
eZAF Smart Quant Results

Element	Weight %	Atomic %	Net Int.	Error %	Kratio	Z	A	F
AgL	98.52	98.58	1688.90	1.88	0.9855	1.0003	0.9999	1.0001
CdL	1.48	1.42	22.50	41.99	0.0142	0.9777	0.9795	0.9987

EDAX TEAM

kV: 15 Mag: 5000 Takeoff: 87.5 Live Time(s): 2.9 Amp Time(µs): 0.48 Resolution:(eV) 129.7

Phase: Unallocated



Lsec: 2.9 0 Cnts 0.000 keV Det: Octane Pro A

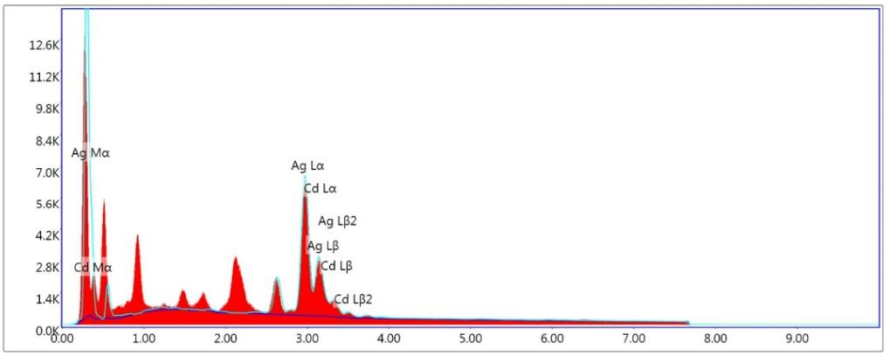
eZAF Smart Quant Results

Element	Weight %	Atomic %	Net Int.	Error %	Kratio	Z	A	F
AgL	82.52	83.10	251.60	20.13	0.8286	1.0040	0.9994	1.0008
CdL	17.48	16.90	47.50	57.52	0.1683	0.9813	0.9824	0.9988

EDAX TEAM

kV: 15 Mag: 5000 Takeoff: 87.5 Live Time(s): 79 Amp Time(µs): 0.48 Resolution:(eV) 129.7

Phase: AgL/CdL



Lsec: 79.0 0 Cnts 0.000 keV Det: Octane Pro A

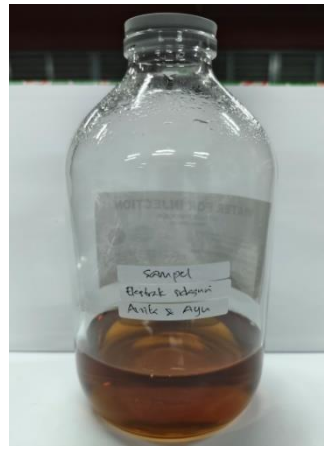
eZAF Smart Quant Results

Element	Weight %	Atomic %	Net Int.	Error %	Kratio	Z	A	F
AgL	98.37	98.44	1742.70	1.88	0.9841	1.0004	0.9999	1.0001
CdL	1.63	1.56	25.60	40.33	0.0155	0.9778	0.9795	0.9987

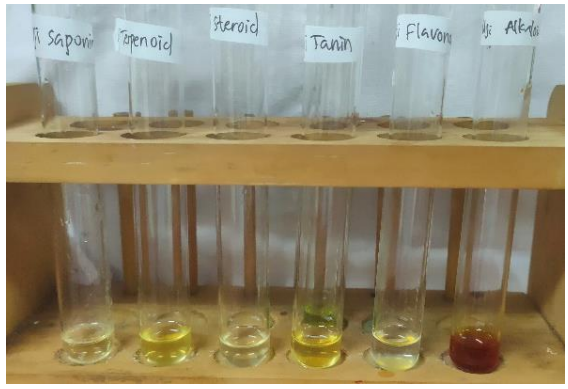
Lampiran 14. Dokumentasi penelitian

Sampel Serbuk Sidaguri

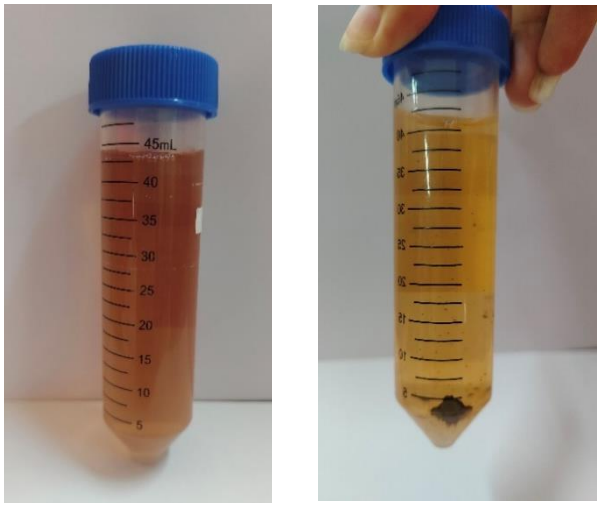
Ekstraksi Sampel



Ekstrak Air Batang Sidaguri



Uji Fitokimia



Sebelum dan sesudah sentrifugasi

Sebelum dan sesudah *Freeze Dry*