

LAMPIRAN

Lampiran 1 Determinasi Tanaman Daun Kelor



BRIN
BADAN RISET
DAN INOVASI NASIONAL

DIREKTORAT PENGELOLAAN KOLEKSI ILMIAH

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Nomor :B-1351/II.6.2/IR.01.02/6/2023
Lampiran : -
Perihal : Hasil Identifikasi/Determinasi Tumbuhan

14 Juni 2023

Yth.
Bpk./Ibu/Sdr(i). **Ira Marshella**
Universitas Esa Unggul

Bersama ini kami sampaikan hasil identifikasi/determinasi tumbuhan yang Saudara kirimkan ke "Herbarium Bogoriense", Direktorat Pengelolaan Koleksi Ilmiah BRIN Cibinong, adalah sebagai berikut:

No.	No. Kol.	Jenis	Suku
1.	Daun Kelor	<i>Moringa oleifera</i> Lam.	Moringaceae

Demikian, semoga berguna bagi Saudara.

Pt. Direktorat Pengelolaan Koleksi Ilmiah,
Badan Riset dan Inovasi Nasional



Dr. Ratih Damayanti, S.Hut., M.Si.



Dokumen ini ditandatangani secara elektronik menggunakan sertifikat dari BSRiE, silahkan lakukan verifikasi pada dokumen elektronik yang dapat diunduh dengan melakukan scan QR Code

Lampiran 2 Perhitungan Rendemen Simplisia (%)

$$\begin{aligned}(\%) \text{ Rendemen} &= \frac{\text{Jumlah berat simplisia kering (g)}}{\text{Jumlah berat simplisia basah (g)}} \times 100\% \\ &= \frac{550 \text{ (g)}}{3000 \text{ g}} \times 100\% \\ &= 18,3\%\end{aligned}$$

Lampiran 3 Perhitungan Rendemen Ekstrak (%)

$$\begin{aligned}(\%) \text{ Rendemen} &= \frac{\text{jumlah berat ekstrak (g)}}{\text{jumlah berat serbuk simplisia (g)}} \times 100\% \\ &= \frac{(163,53+119,9)-163,53(g)}{300 (g)} \times 100\% \\ &= \frac{283,43 - 163,53 (g)}{300 (g)} \times 100\% \\ &= \frac{119,9 (g)}{300 gr} \times 100\% \\ &= 39,97\%\end{aligned}$$

Keterangan:

Berat ekstrak = (berat cawan + ekstrak) – berat cawan kosong (g)

Berdasarkan perhitungan diatas, maka hasil % rendemen ekstrak etanol daun kelor yaitu 39,97%.

Lampiran 4 Perhitungan Sediaan Gel 100 Gram

Perhitungan bahan :

$$\begin{aligned}
 \text{F1} &= \text{Ekstrak daun kelor} &= \frac{6}{100} \times 100 \text{ gram} &= 6 \text{ gram} \\
 & \text{Carbomer} &= \frac{0,6}{100} \times 100 \text{ gram} &= 0,6 \text{ gram} \\
 & \text{Air untuk carbomer} &= 0,6 \text{ gram} \times 20 &= 12 \text{ ml} \\
 & \text{Na-CMC} &= \frac{2,4}{100} \times 100 \text{ gram} &= 2,4 \text{ gram} \\
 & \text{Air untuk Na-CMC} &= 2,4 \text{ gram} \times 20 &= 48 \text{ ml} \\
 & \text{Trietanolamin} &= \frac{0,2}{100} \times 100 \text{ gram} &= 0,2 \text{ gram} \\
 & \text{Metil paraben} &= \frac{0,2}{100} \times 100 \text{ gram} &= 0,2 \text{ gram} \\
 & \text{Propilenglikol} &= \frac{15}{100} \times 100 \text{ gram} &= 15 \text{ gram} \\
 & \text{Aquadest} &= 100 - (6 \text{ g} + 0,6 \text{ g} + 12 \text{ ml} + 48 \text{ ml} + 0,2 \text{ g} \\
 & & \quad \quad \quad + 15 \text{ g} + 0,2 \text{ g}) & \\
 & & &= 18 \text{ ml}
 \end{aligned}$$

$$\begin{aligned}
 \text{F2} &= \text{Ekstrak daun kelor} &= \frac{6}{100} \times 100 \text{ gram} &= 6 \text{ gram} \\
 & \text{Carbomer} &= \frac{0,9}{100} \times 100 \text{ gram} &= 0,9 \text{ gram} \\
 & \text{Air untuk carbomer} &= 0,9 \text{ gram} \times 20 &= 18 \text{ ml} \\
 & \text{Na-CMC} &= \frac{2,1}{100} \times 100 \text{ gram} &= 2,1 \text{ gram} \\
 & \text{Air untuk Na-CMC} &= 2,1 \text{ gram} \times 20 &= 42 \text{ ml} \\
 & \text{Trietanolamin} &= \frac{0,2}{100} \times 100 \text{ gram} &= 0,2 \text{ gram} \\
 & \text{Metil paraben} &= \frac{0,2}{100} \times 100 \text{ gram} &= 0,2 \text{ gram} \\
 & \text{Propilenglikol} &= \frac{15}{100} \times 100 \text{ gram} &= 15 \text{ gram} \\
 & \text{Aquadest} &= 100 - (6 \text{ g} + 0,9 \text{ g} + 18 \text{ ml} + 2,1 \text{ g} + 42 \text{ ml} \\
 & & \quad \quad \quad + 0,2 \text{ g} + 15 \text{ g}) & \\
 & & &= 15,4 \text{ ml}
 \end{aligned}$$

$$\begin{aligned}
 \text{F3} &= \text{Ekstrak daun kelor} &= \frac{6}{100} \times 100 \text{ gram} &= 6 \text{ gram} \\
 &\text{Carbomer} &= \frac{1,2}{100} \times 100 \text{ gram} &= 1,2 \text{ gram} \\
 &\text{Air untuk carbomer} &= 1,2 \text{ gram} \times 20 &= 24 \text{ ml} \\
 &\text{Na-CMC} &= \frac{1,8}{100} \times 100 \text{ gram} &= 1,8 \text{ gram} \\
 &\text{Air untuk Na-CMC} &= 1,8 \text{ gram} \times 20 &= 36 \text{ ml} \\
 &\text{Trietanolamin} &= \frac{0,2}{100} \times 100 \text{ gram} &= 0,2 \text{ gram} \\
 &\text{Metil paraben} &= \frac{0,2}{100} \times 100 \text{ gram} &= 0,2 \text{ gram} \\
 &\text{Propilenglikol} &= \frac{15}{100} \times 100 \text{ gram} &= 15 \text{ gram} \\
 &\text{Aquadest} &= 100 - (6 \text{ g} + 1,2 \text{ g} + 24 \text{ ml} + 1,8 \text{ g} + 36 \text{ ml} \\
 &&&+ 0,2 \text{ g} + 0,2 \text{ g} + 15 \text{ g}) \\
 &&&= 15,6 \text{ ml}
 \end{aligned}$$

$$\begin{aligned}
 \text{F4} &= \text{Ekstrak daun kelor} &= \frac{6}{100} \times 100 \text{ gram} &= 6 \text{ gram} \\
 &\text{Carbomer} &= \frac{1,5}{100} \times 100 \text{ gram} &= 1,5 \text{ gram} \\
 &\text{Air untuk carbomer} &= 1,5 \text{ gram} \times 20 &= 30 \text{ ml} \\
 &\text{Na-CMC} &= \frac{1,5}{100} \times 100 \text{ gram} &= 1,5 \text{ gram} \\
 &\text{Air untuk carbomer} &= 1,5 \text{ gram} \times 20 &= 30 \text{ ml} \\
 &\text{Trietanolamin} &= \frac{0,2}{100} \times 100 \text{ gram} &= 0,2 \text{ gram} \\
 &\text{Metil paraben} &= \frac{0,2}{100} \times 100 \text{ gram} &= 0,2 \text{ gram} \\
 &\text{Propilenglikol} &= \frac{15}{100} \times 100 \text{ gram} &= 15 \text{ gram} \\
 &\text{Aquadest} &= 100 - (6 \text{ g} + 1,5 \text{ g} + 30 \text{ ml} + 1,5 \text{ g} + 30 \text{ ml} \\
 &&&+ 0,2 \text{ g} + 0,2 \text{ g} + 15 \text{ g}) \\
 &&&= 15,6 \text{ ml}
 \end{aligned}$$

$$\begin{aligned} \text{F5} &= \text{Ekstrak daun kelor} = \frac{6}{100} \times 100 \text{ gram} = 6 \text{ gram} \\ &= \text{Carbomer} = \frac{1,8}{100} \times 100 \text{ gram} = 1,8 \text{ gram} \\ &= \text{Air untuk carbomer} = 1,8 \text{ gram} \times 20 = 36 \text{ ml} \\ &= \text{Na-CMC} = \frac{1,2}{100} \times 100 \text{ gram} = 1,2 \text{ gram} \\ &= \text{Air untuk Na-CMC} = 1,2 \text{ gram} \times 20 = 24 \text{ ml} \\ &= \text{Trietanolamin} = \frac{0,2}{100} \times 100 \text{ gram} = 0,2 \text{ gram} \\ &= \text{Metil paraben} = \frac{0,2}{100} \times 100 \text{ gram} = 0,2 \text{ gram} \\ &= \text{Propilenglikol} = \frac{15}{100} \times 100 \text{ gram} = 15 \text{ gram} \\ &= \text{Aquadest} = 100 - (6 \text{ g} + 1,5 \text{ g} + 30 \text{ ml} + 1,5 \text{ g} + 30 \text{ ml} \\ &\quad + 0,2 \text{ g} + 0,2 \text{ g} + 15 \text{ g}) \\ &= 15,6 \text{ ml} \end{aligned}$$

Lampiran 5 Perhitungan Sediaan Gel Formula Optimum 300 Gram

Perhitungan bahan :

Formula 1

Ekstrak daun kelor	$= \frac{6}{100} \times 300 \text{ gram}$	$= 18 \text{ gram}$
Carbomer	$= \frac{0,6}{100} \times 300 \text{ gram}$	$= 1,8 \text{ gram}$
Air untuk carbomer	$= 3 \text{ gram} \times 20$	$= 36 \text{ ml}$
Na-CMC	$= \frac{2,4}{100} \times 300 \text{ gram}$	$= 7,2 \text{ gram}$
Air untuk Na-CMC	$= 2,4 \text{ gram} \times 20$	$= 144 \text{ ml}$
Trietanolamin	$= \frac{0,2}{100} \times 300 \text{ gram}$	$= 0,6 \text{ gram}$
Metil paraben	$= \frac{0,2}{100} \times 300 \text{ gram}$	$= 0,6 \text{ gram}$
Propilenglikol	$= \frac{15}{100} \times 300 \text{ gram}$	$= 45 \text{ gram}$
Aquadest	$= 100 - (18 \text{ g} + 1,8 \text{ g} + 36 \text{ ml} + 7,2 \text{ g} + 144 \text{ ml} + 0,6 \text{ g} +$ $0,6 \text{ g} + 45 \text{ g})$	
		$= 46,8 \text{ ml}$

Lampiran 6 Perhitungan (%) Sineresis

Perhitungan sineresis

Rumus : Perhitungan persentase (%) sineresis:

$$\text{Sineresis (\%)} = \frac{\text{berat awal} - \text{berat akhir}}{\text{berat awal}} \times 100\%$$

Suhu 35°C

Jam ke-24 :

$$\begin{aligned} \text{Sineresis (\%)} &= \frac{225,26 - 225,20}{225,26} \times 100\% \\ &= 0,027\% \end{aligned}$$

Jam ke-48 :

$$\begin{aligned} \text{Sineresis (\%)} &= \frac{225,26 - 225,16}{225,26} \times 100\% \\ &= 0,044\% \end{aligned}$$

Jam ke-72 :

$$\begin{aligned} \text{Sineresis (\%)} &= \frac{225,26 - 225,14}{225,26} \times 100\% \\ &= 0,053\% \end{aligned}$$

Suhu 5°C

Jam ke-24 :

$$\begin{aligned} \text{Sineresis (\%)} &= \frac{225,41 - 225,36}{225,41} \times 100\% \\ &= 0,05\% \end{aligned}$$

Jam ke-48 :

$$\begin{aligned} \text{Sineresis (\%)} &= \frac{225,41 - 225,33}{225,41} \times 100\% \\ &= 0,08\% \end{aligned}$$

Jam ke-72 :

$$\begin{aligned} \text{Sineresis (\%)} &= \frac{225,41 - 225,31}{225,41} \times 100\% \\ &= 0,1\% \end{aligned}$$

Lampiran 7 Hasil Formula Yang Optimum**Solutions**

1 Solutions found

Number	Karbopol 940	CMC-Na	Uji pH	Uji Daya Sebar	Uji Daya Lekat	Desirability	
1	20.000	80.000	6.444	5.656	3.460	0.849	Selected

Lampiran 8 Hasil ANOVA *Fit Statistik Simplex Lattice Design*

ANOVA for *Quadratic model*

ANOVA for Linear model

Response 1: Uji pH

Source	Sum of Squares	df	Mean Square	F-value	p-value	
Model	0.5033	1	0.5033	294.32	< 0.0001	significant
⁽¹⁾ Linear Mixture	0.5033	1	0.5033	294.32	< 0.0001	
Residual	0.0103	6	0.0017			
Lack of Fit	0.0044	3	0.0015	0.7540	0.5890	not significant
Pure Error	0.0059	3	0.0020			
Cor Total	0.5136	7				

Fit Statistics

Std. Dev.	0.0414		R²	0.9800
Mean	6.11		Adjusted R²	0.9767
C.V. %	0.6768		Predicted R²	0.9577
			Adeq Precision	32.3491

ANOVA for Linear model

Response 2: Uji Daya Sebar

Source	Sum of Squares	df	Mean Square	F-value	p-value	
Model	0.3254	1	0.3254	279.10	< 0.0001	significant
⁽¹⁾ Linear Mixture	0.3254	1	0.3254	279.10	< 0.0001	
Residual	0.0070	6	0.0012			
Lack of Fit	0.0042	3	0.0014	1.50	0.3739	not significant
Pure Error	0.0028	3	0.0009			
Cor Total	0.3323	7				

Fit Statistics

Std. Dev.	0.0341		R²	0.9790
Mean	5.39		Adjusted R²	0.9754
C.V. %	0.6337		Predicted R²	0.9572
			Adeq Precision	31.5015

ANOVA for Linear model

Response 3: Uji Daya Lekat

Source	Sum of Squares	df	Mean Square	F-value	p-value	
Model	1.17	1	1.17	71.69	0.0001	significant
⁽¹⁾ Linear Mixture	1.17	1	1.17	71.69	0.0001	
Residual	0.0975	6	0.0163			
Lack of Fit	0.0049	3	0.0016	0.0527	0.9813	not significant
Pure Error	0.0927	3	0.0309			
Cor Total	1.26	7				

Fit Statistics

Std. Dev.	0.1275	R²	0.9228
Mean	2.95	Adjusted R²	0.9099
C.V. %	4.32	Predicted R²	0.8271
		Adeq Precision	15.9656

Lampiran 9 Analisis Data SPSS *One Sample T-Test*

Uji pH

→ T-Test

One-Sample Statistics						
	N	Mean	Std. Deviation	Std. Error Mean		
Hasil	3	6,3867	,03215	,01856		

One-Sample Test						
Test Value = 6.44						
	t	df	Sig. (2-tailed)	Mean Difference	95% Confidence Interval of the Difference	
					Lower	Upper
Hasil	-2,874	2	,103	-,05333	-,1332	,0265

Uji daya sebar

→ T-Test

One-Sample Statistics				
	N	Mean	Std. Deviation	Std. Error Mean
Hasil	3	5,4333	,40415	,23333

One-Sample Test						
Test Value = 5.65						
	t	df	Sig. (2-tailed)	Mean Difference	95% Confidence Interval of the Difference	
					Lower	Upper
Hasil	-,929	2	,451	-,21667	-,12206	,7873

Uji daya lekat

→ T-Test

One-Sample Statistics				
	N	Mean	Std. Deviation	Std. Error Mean
Hasil	3	3,2667	,20817	,12019

One-Sample Test						
Test Value = 3.46						
	t	df	Sig. (2-tailed)	Mean Difference	95% Confidence Interval of the Difference	
					Lower	Upper
Hasil	-1,609	2	,249	-,19333	-,7104	,3238

Lampiran 10 Alat dan Bahan



Rotary evaporator



Neraca analitik



Hot Plate



Viskometer digital



pH meter



Grinder



Carbomer



Na-CMC



Trietanolamin (TEA)



Propilenglikol



Metilparaben

Lampiran 11 Certificate Of Analysis (COA)

Lubrizon
Product Specification

CARBOPOL™ 940 NF POLYMER

Carbopol 940 NF polymer meets the limits cited in the current edition of the following monograph:
 • United States Pharmacopoeia National Formulary (USP-NF) monograph for Carbomer 940

General Product Characteristics
 Appearance: White, fully swelled
 Odor: Slightly acidic

Test	Specification	Lot Test Frequency	Test Procedure
Identification	Pass	1,000	USP-NF
Contentment test	Pass	1,000	USP-NF
Colloidal test	Pass	1,000	USP-NF
Carboxylic Acid Content, Assay %	99.0 - 99.0	1,1	Laborat 1378-A
Viscosity, 0.5% w/v, 25 °C (Dissolved 0.1% w/v, neutralized to pH 7.3 - 7.8)	40,000 - 60,000	1,1	Laborat 400-1
Clarity, % Transmission (0.1% Chloroform, neutralized, 400 nm)	80 min 2.0 max	1,1 1,1	Laborat 400-2 USP-NF
Loss on Drying, %	20 max	1,000	USP-NF
Heavy Metals, ppm Total Heavy Metals, in Pb (ppm)-max: 10, Pb, As, Cd	10 max	1,000	Laborat 54-012
Residual Solvent, ppm Benzene	1,000 max	1,1	Laborat 54-006
Residual Monomer, ppm Free acrylic acid	2,500 max	1,1	Laborat 54-005

PT. ARBE CHEMINDO

CERTIFICATE OF ANALYSIS

ARBCEL F - 400 P

Lot No. : 10237478
 Production Date : December 08, 2024
 Expiry Date : December 08, 2024
 SPC-L1/F1 : If stored under dry and clean conditions in its original packaging, the product has long shelf life.

On this, which the customer's name is a part, the following information is provided. This conforms to the agreed product specifications.

Item of Analysis	Method	Result	Unit
1. Viscosity, 1% solution, 25 °C	ASTM D 1431 - 15	490	200 - 600 cps
2. Residue (in percent)	ASTM D 1431 - 15	7.2%	10% max.
3. Heavy Metals (ppm)	WALWA	98.9%	98.9% max.
4. SS	ASTM D 1431 - 15	0.02	0.05 - 0.03
5. pH Value	Handbook 080	7.65	6.5 - 7.5
6. Bulk Density (kg)	500 g/100 ml	800.000	-

Specification

8.22341.5000 Triethanolamine EMPLURAB

Specification	Unit	% max
Assay (GC, area%)	1.000	-
Assay (HPLC, 10% v/v)	1.000 - 1.000	-
Viscosity, F1	1.000	-
Appearance	clear color	-

PT. BRATACO

HASIL PEMERIKSAAN

Nama Bahan : Propilen Glikol
 No. Batch : J004118 (C110484C27)
 Asal : Chem Chemical Pacific, Singapore
 P. D : 1/2024
 Grade : Food Grade

Pemeriksaan : Cara kental amibn kball berwujud, Sifat berwujud, rasa tidak manis, Tidak berbau, dan tidak berbau.
 Fisikokimia

Kelengkapan : Dapat beresamup dgn air, dengan standi dan dengan karbonat
 Sesuai

Kesamaan-bahan : 0.5-10 NaOH 0.1N
 0.2 ml NaOH 0.1 N

Indice Bias : 1.431 - 1.433
 1.433

Bobot per-ml : 1.035 g - 1.037 g/ml
 1.036 g/ml

pH : 8.5
 7.470

Kasmpulan : Murni dan Sesuai

Methyl Paraben

Lot No. : M1000
 CAS No. : 99-08-1
 Batch No. : 21008

Chemical Name : Methyl 4-Hydroxybenzoate

PHYSICAL AND CHEMICAL PROPERTIES

Molecular Formula : C₈H₈O₂
 Molecular Weight : 152.15
 Storage : Powder, 25°C, 3 years
 In solution, 25°C, 6 months
 25°C, 3 months

Chemical Structure:

CCOC(=O)C1=CC=C(O)C=C1

ANALYTICAL DATA

Appearance : White to off-white (solid)
 14.8800 Specimen
 Purity (HPLC) : 99.72%
 Conclusion : The product has been tested and complies with the given specifications.

Certificate of Analysis

Metilparaben

Lot No. : M1000
 CAS No. : 99-08-1
 Batch No. : 21008

Chemical Name : Methyl 4-Hydroxybenzoate

PHYSICAL AND CHEMICAL PROPERTIES

Molecular Formula : C₈H₈O₂
 Molecular Weight : 152.15
 Storage : Powder, 25°C, 3 years
 In solution, 25°C, 6 months
 25°C, 3 months

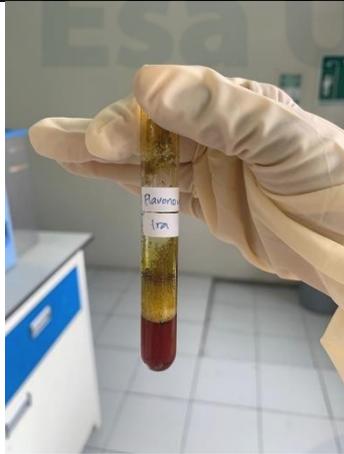
Chemical Structure:

CCOC(=O)C1=CC=C(O)C=C1

ANALYTICAL DATA

Appearance : White to off-white (solid)
 14.8800 Specimen
 Purity (HPLC) : 99.72%
 Conclusion : The product has been tested and complies with the given specifications.

Lampiran 12 Dokumentasi Skrining Fitokimia



Flavonoid
(Positif)



Tanin
(Positif)



Saponin
(Positif)



Alkaloid preaksi Mayer
(Positif)



Alkaloid preaksi Dragendorff
(Positif)



Steroid
(Negatif)



Triterpenoid
(Negatif)

Lampiran 13 Dokumentasi Lain Lain



Daun kelor



Proses pencucian



Pengeringan oven



Daun kelor kering



Grinder



Pengayakan



Proses ekstraksi maserasi



Pengadukan maserasi



Penyaringan filtrat ekstrak etanol daun kelor



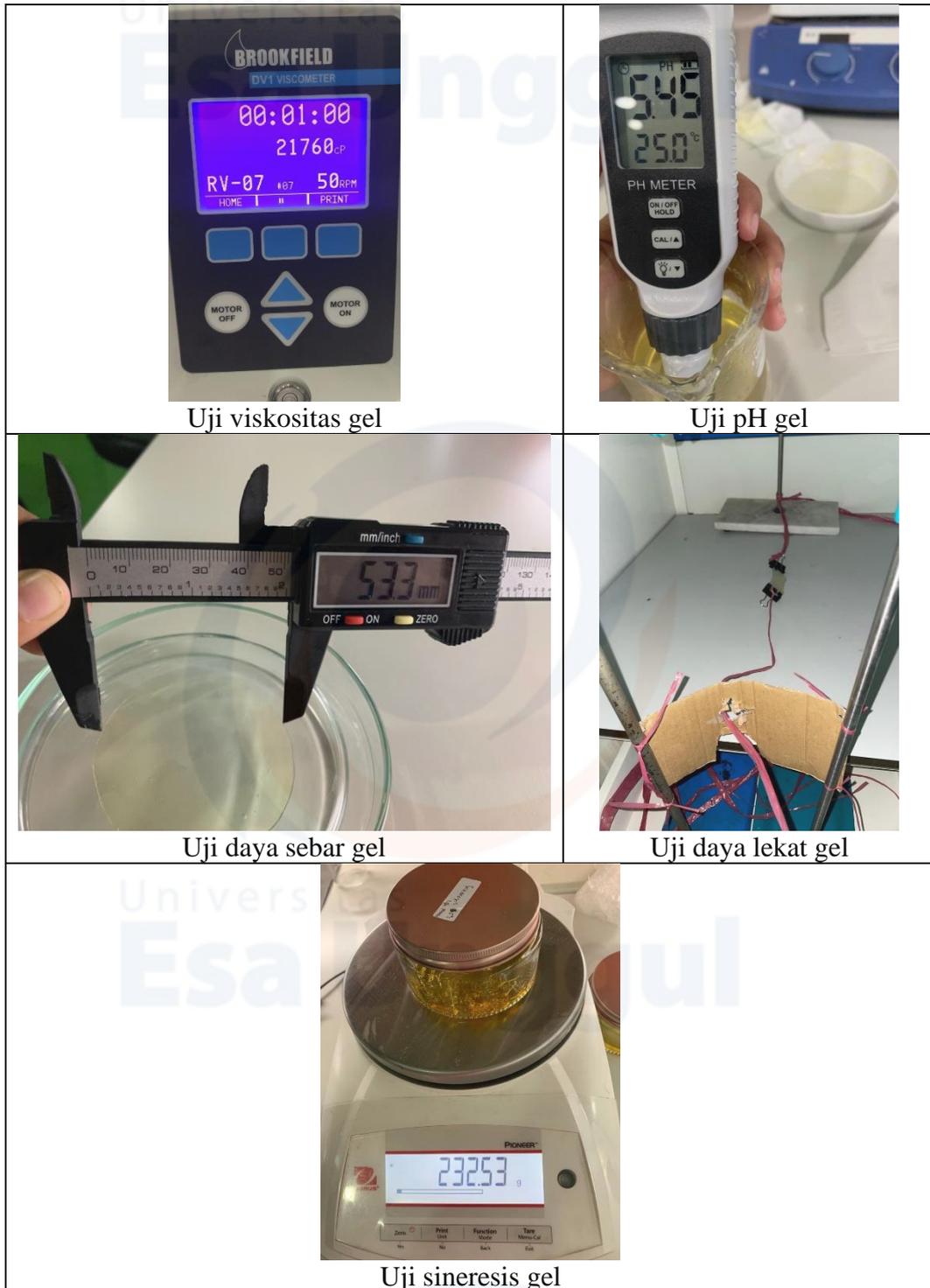
Penguapan pelarut dengan alat rotary evaporator



Gel ekstrak etanol daun kelor



Uji homogenitas



Uji viskositas gel

Uji pH gel

Uji daya sebar gel

Uji daya lekat gel

Uji sineresis gel