

**LAMPIRAN**

**Lampiran 1 Daun putri malu**



## Lampiran 2 Determinasi tanaman putri malu


**BRIN**  
BADAN RISET DAN INOVASI NASIONAL

**DIREKTORAT PENGELOLAAN KOLEKSI ILMIAH**  
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Nomor : B-1358/II.6.2/IR.01.02/6/2023 14 Juni 2023  
 Lampiran : -  
 Perihal : Hasil Identifikasi/Determinasi Tumbuhan

Yth.  
 Bpk./Ibu/Sdr(i), **Fabio Rifqi Isyraq Hasan**  
 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.	Tanaman Putri Malu	<i>Mimosa pudica</i> L.	Fabaceae

Demikian, semoga berguna bagi Saudara.

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



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



Dokumen ini ditandatangani secara elektronik menggunakan sertifikat dari BIRE, standar ukuran verifikasi pada dokumen elektronik yang dapat diunduh dengan melakukan scan QR Code

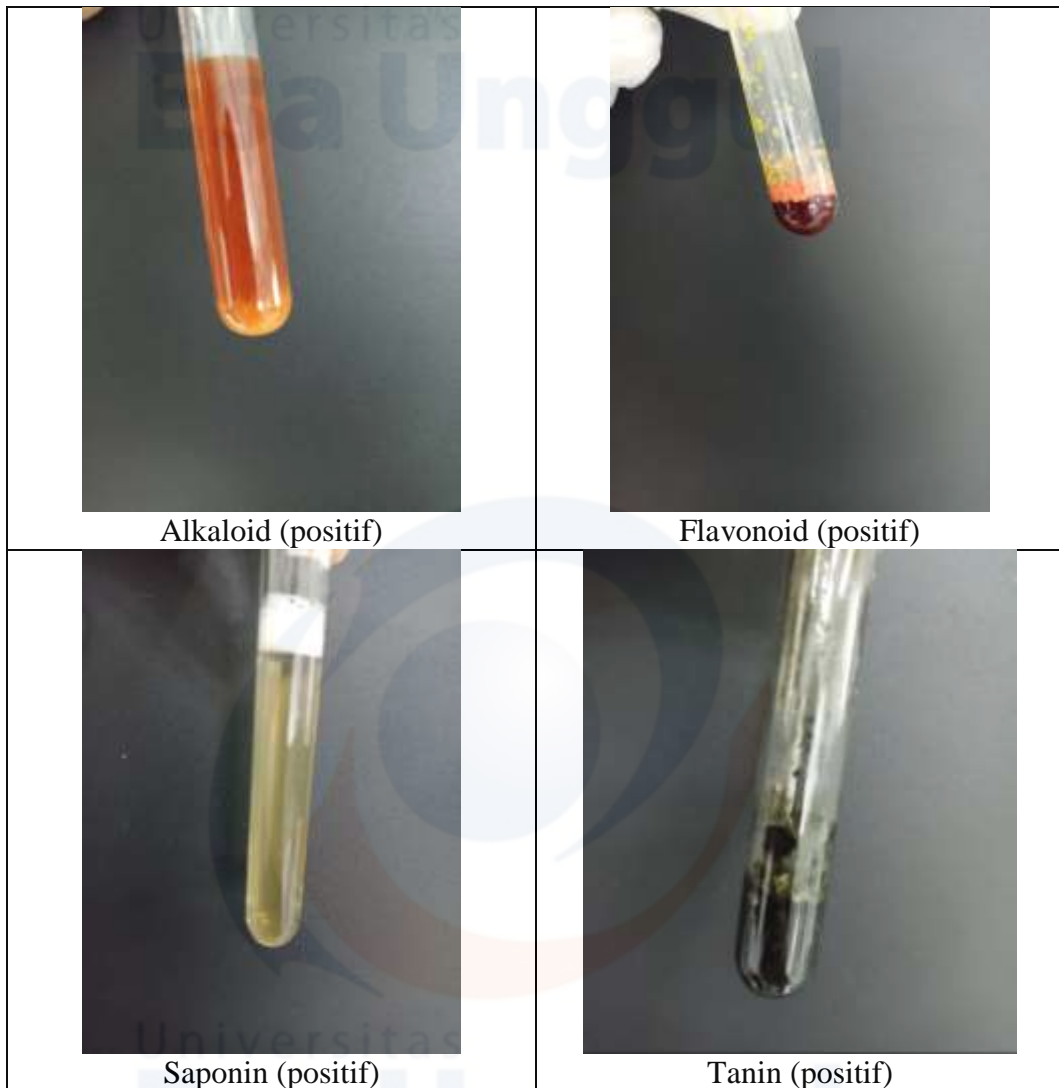
**Lampiran 3** Perhitungan rendemen simplisia (%)

$$\begin{aligned}\% \text{ Pengerinan} &= \frac{\text{Berat daun kering}}{\text{Berat daun basah}} \times 100\% \\ &= \frac{706,57}{3.000} \times 100\% \\ &= 23,55\%\end{aligned}$$

**Lampiran 4** Perhitungan rendemen ekstrak (%)

$$\begin{aligned}\% \text{ Rendemen} &= \frac{\text{Berat ekstrak}}{\text{berat simplisia}} \times 100\% \\ &= \frac{22,60}{500} \times 100\% \\ &= 4,52\%\end{aligned}$$

Lampiran 5 Skrining fitokimia



**Lampiran 6** Perhitungan sediaan gel 100 gram

$$\begin{aligned}
 \text{Formula 1} = & \text{Ekstrak daun putri malu 1\%} & = \frac{1}{100} \times 100 = 1 \text{ gram} \\
 & \text{HPMC 0,3\%} & = \frac{0,3}{100} \times 100 = 0,3 \text{ gram} \\
 & \text{CMC-Na 2,7\%} & = \frac{2,7}{100} \times 100 = 2,7 \text{ gram} \\
 & \text{Propilen glikol 10\%} & = \frac{10}{100} \times 100 = 10 \text{ gram} \\
 & \text{Metilparaben 0,2\%} & = \frac{0,2}{100} \times 100 = 0,2 \text{ gram} \\
 & \text{Aquadest} & = 100 - (1\text{g} + 0,3\text{g} + 2,7\text{g} + \\
 & & \quad 10\text{g} + 0,2\text{g}) \\
 & & = 85,8 \text{ gram}
 \end{aligned}$$

$$\begin{aligned}
 \text{Formula 2} = & \text{Ekstrak daun putri malu 1\%} & = \frac{1}{100} \times 100 = 1 \text{ gram} \\
 & \text{HPMC 0,6\%} & = \frac{0,6}{100} \times 100 = 0,6 \text{ gram} \\
 & \text{CMC-Na 2,4\%} & = \frac{2,4}{100} \times 100 = 2,4 \text{ gram} \\
 & \text{Propilen glikol 10\%} & = \frac{10}{100} \times 100 = 10 \text{ gram} \\
 & \text{Metilparaben 0,2\%} & = \frac{0,2}{100} \times 100 = 0,2 \text{ gram} \\
 & \text{Aquadest} & = 100 - (1\text{g} + 0,6\text{g} + 2,4\text{g} + \\
 & & \quad 10\text{g} + 0,2\text{g}) \\
 & & = 85,8 \text{ gram}
 \end{aligned}$$

$$\begin{aligned}
 \text{Formula 3} = & \text{Ekstrak daun putri malu 1\%} & = \frac{1}{100} \times 100 = 1 \text{ gram} \\
 & \text{HPMC 0,9\%} & = \frac{0,9}{100} \times 100 = 0,9 \text{ gram} \\
 & \text{CMC-Na 2,1\%} & = \frac{2,1}{100} \times 100 = 2,1 \text{ gram} \\
 & \text{Propilen glikol 10\%} & = \frac{10}{100} \times 100 = 10 \text{ gram} \\
 & \text{Metilparaben 0,2\%} & = \frac{0,2}{100} \times 100 = 0,2 \text{ gram} \\
 & \text{Aquadest} & = 100 - (1\text{g} + 0,9\text{g} + 2,1\text{g} + \\
 & & \quad 10\text{g} + 0,2\text{g}) \\
 & & = 85,8 \text{ gram}
 \end{aligned}$$

$$\begin{aligned}
 \text{Formula 4} = & \text{Ekstrak daun putri malu 1\%} & = \frac{1}{100} \times 100 = 1 \text{ gram} \\
 & \text{HPMC 1,2\%} & = \frac{1,2}{100} \times 100 = 1,2 \text{ gram} \\
 & \text{CMC-Na 1,8\%} & = \frac{1,8}{100} \times 100 = 1,8 \text{ gram} \\
 & \text{Propilen glikol 10\%} & = \frac{10}{100} \times 100 = 10 \text{ gram} \\
 & \text{Metilparaben 0,2\%} & = \frac{0,2}{100} \times 100 = 0,2 \text{ gram} \\
 & \text{Aquadest} & = 100 - (1\text{g} + 1,2\text{g} + 1,8\text{g} + \\
 & & \quad 10\text{g} + 0,2\text{g}) \\
 & & = 85,8 \text{ gram}
 \end{aligned}$$

$$\begin{aligned}
 \text{Formula 5} = & \text{Ekstrak daun putri malu 1\%} & = \frac{1}{100} \times 100 = 1 \text{ gram} \\
 & \text{HPMC 1,5\%} & = \frac{1,5}{100} \times 100 = 1,5 \text{ gram} \\
 & \text{CMC-Na 1,5\%} & = \frac{1,5}{100} \times 100 = 1,5 \text{ gram} \\
 & \text{Propilen glikol 10\%} & = \frac{10}{100} \times 100 = 10 \text{ gram} \\
 & \text{Metilparaben 0,2\%} & = \frac{0,2}{100} \times 100 = 0,2 \text{ gram} \\
 & \text{Aquadest} & = 100 - (1\text{g} + 1,5\text{g} + 1,5\text{g} + \\
 & & \quad 10\text{g} + 0,2\text{g}) \\
 & & = 85,8 \text{ gram}
 \end{aligned}$$

Lampiran 7 Hasil ANOVA *fit statistic simplex lattice design*

## Hasil pH

Response 1: pH						
Source	Sum of Squares	df	Mean Square	F-value	p-value	
<b>Model</b>	1.14	2	0.5696	37.29	0.0010	significant
<sup>(1)</sup> Linear Mixture	1.03	1	1.03	67.25	0.0004	
AB	0.1120	1	0.1120	7.33	0.0424	
<b>Residual</b>	0.0764	5	0.0153			
Lack of Fit	0.0056	2	0.0028	0.1181	0.8926	not significant
Pure Error	0.0708	3	0.0236			
<b>Cor Total</b>	1.22	7				

## Fit Statistics

<b>Std. Dev.</b>	0.1236	<b>R<sup>2</sup></b>	0.9372
<b>Mean</b>	5.95	<b>Adjusted R<sup>2</sup></b>	0.9120
<b>C.V. %</b>	2.08	<b>Predicted R<sup>2</sup></b>	0.8000
		<b>Adeq Precision</b>	12.6256

## Coefficients in Terms of Coded Factors

Component	Coefficient Estimate	df	Standard Error	95% CI Low	95% CI High	VIF
A-HPMC	5.35	1	0.0845	5.13	5.57	1.46
B-CMC-Na	6.31	1	0.0845	6.09	6.52	1.46
AB	1.06	1	0.3916	0.0538	2.07	1.96

## Hasil Daya Sebar

Response 2: Daya Sebar						
Source	Sum of Squares	df	Mean Square	F-value	p-value	
<b>Model</b>	1.58	1	1.58	254.49	< 0.0001	significant
<sup>(1)</sup> Linear Mixture	1.58	1	1.58	254.49	< 0.0001	
<b>Residual</b>	0.0373	6	0.0062			
Lack of Fit	0.0146	3	0.0049	0.6454	0.6361	not significant
Pure Error	0.0227	3	0.0076			
<b>Cor Total</b>	1.62	7				



**Fit Statistics**

<b>Std. Dev.</b>	0.0789	<b>R<sup>2</sup></b>	0.9770
<b>Mean</b>	5.92	<b>Adjusted R<sup>2</sup></b>	0.9731
<b>C.V. %</b>	1.33	<b>Predicted R<sup>2</sup></b>	0.9517
		<b>Adeq Precision</b>	30.0808

**Coefficients in Terms of Coded Factors**

Component	Coefficient Estimate	df	Standard Error	95% CI Low	95% CI High	VIF
A-HPMC	6.51	1	0.0465	6.40	6.62	1.09
B-CMC-Na	5.32	1	0.0465	5.21	5.44	1.09

**Hasil Daya Lekat****Response 3: Daya Lekat**

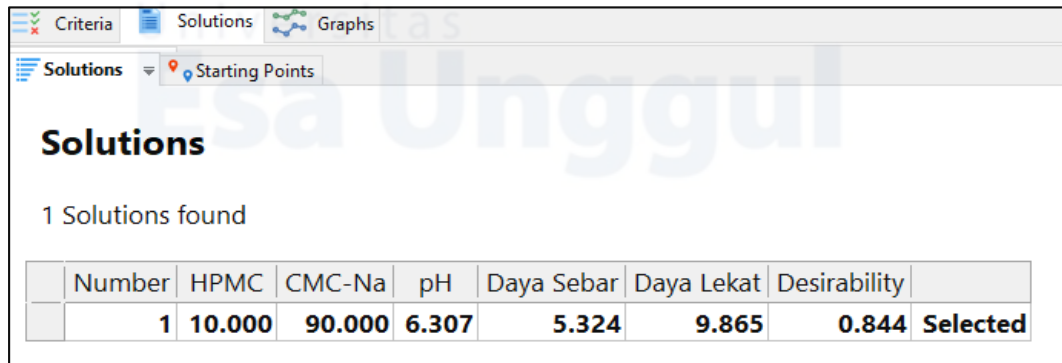
Source	Sum of Squares	df	Mean Square	F-value	p-value	
<b>Model</b>	56.25	2	28.13	46.89	0.0006	significant
( <sup>4</sup> )Linear Mixture	47.47	1	47.47	79.14	0.0003	
AB	8.79	1	8.79	14.65	0.0123	
<b>Residual</b>	3.00	5	0.5998			
Lack of Fit	0.6441	2	0.3221	0.4103	0.6958	not significant
Pure Error	2.35	3	0.7850			
<b>Cor Total</b>	59.25	7				

**Fit Statistics**

<b>Std. Dev.</b>	0.7745	<b>R<sup>2</sup></b>	0.9494
<b>Mean</b>	5.59	<b>Adjusted R<sup>2</sup></b>	0.9291
<b>C.V. %</b>	13.85	<b>Predicted R<sup>2</sup></b>	0.8410
		<b>Adeq Precision</b>	13.9855

**Coefficients in Terms of Coded Factors**

Component	Coefficient Estimate	df	Standard Error	95% CI Low	95% CI High	VIF
A-HPMC	3.37	1	0.5294	2.01	4.73	1.46
B-CMC-Na	9.87	1	0.5294	8.50	11.23	1.46
AB	-9.39	1	2.45	-15.70	-3.08	1.96

**Lampiran 8** Hasil formula optimum

**Solutions**

1 Solutions found

Number	HPMC	CMC-Na	pH	Daya Sebar	Daya Lekat	Desirability	
1	10.000	90.000	6.307	5.324	9.865	0.844	Selected

**Lampiran 9** Perhitungan sediaan gel 300 gram untuk formula optimum

Formula optimum =

$$\begin{aligned} \text{Ekstrak daun putri malu 1\%} &= \frac{1}{100} \times 300 = 3 \text{ gram} \\ \text{HPMC 0,3\%} &= \frac{0,3}{100} \times 300 = 0,9 \text{ gram} \\ \text{CMC-Na 2,7\%} &= \frac{2,7}{100} \times 300 = 8,1 \text{ gram} \\ \text{Propilen glikol 10\%} &= \frac{10}{100} \times 300 = 30 \text{ gram} \\ \text{Metilparaben 0,2\%} &= \frac{0,2}{100} \times 300 = 0,6 \text{ gram} \\ \text{Aquadest} &= 300 - (3\text{g} + 0,9\text{g} + 8,1\text{g} + \\ &\quad 30\text{g} + 0,6\text{g}) \\ &= 257,4 \text{ gram} \end{aligned}$$

**Lampiran 10** Analisis data SPSS *one sample t-test*

**Hasil pH**

One-Sample Statistics				
	N	Mean	Std. Deviation	Std. Error Mean
Hasil pH Formula Optimum	3	6.3467	.03055	.01764

One-Sample Test						
Test Value = 6.307						
	t	df	Sig. (2-tailed)	Mean Difference	95% Confidence Interval of the Difference	
					Lower	Upper
Hasil pH Formula Optimum	2.249	2	.153	.03967	-.0362	.1156

**Hasil daya sebar**

One-Sample Statistics				
	N	Mean	Std. Deviation	Std. Error Mean
Hasil Daya Sebar Formula Optimum	3	5.6233	.15948	.09207

One-Sample Test						
Test Value = 5.324						
	t	df	Sig. (2-tailed)	Mean Difference	95% Confidence Interval of the Difference	
					Lower	Upper
Hasil Daya Sebar Formula Optimum	3.251	2	.083	.29933	-.0968	.6955

**Hasil daya lekat**

One-Sample Statistics				
	N	Mean	Std. Deviation	Std. Error Mean
Hasil Daya Lekat Formula Optimum	3	9.1900	.77019	.44467

One-Sample Test						
Test Value = 9.865						
	t	df	Sig. (2-tailed)	Mean Difference	95% Confidence Interval of the Difference	
					Lower	Upper
Hasil Daya Lekat Formula Optimum	-1.518	2	.268	-.67500	-2.5883	1.2383

**Lampiran 11** Perhitungan sineresis (%)

Rumus sineresis :

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

**Hari ke 1 Suhu 5±2°C**

$$\begin{aligned} \text{Sineresis (\%)} &= \frac{50,76 \text{ g} - 50,75 \text{ g}}{50,76 \text{ g}} \times 100\% \\ &= 0,02\% \end{aligned}$$

**Hari ke 1 Suhu 35±2°C**

$$\begin{aligned} \text{Sineresis (\%)} &= \frac{50,03 \text{ g} - 49,84 \text{ g}}{50,03 \text{ g}} \times 100\% \\ &= 0,38\% \end{aligned}$$

**Hari ke 2 Suhu 5±2°C**

$$\begin{aligned} \text{Sineresis (\%)} &= \frac{50,75 \text{ g} - 50,73 \text{ g}}{50,75 \text{ g}} \times 100\% \\ &= 0,04\% \end{aligned}$$

**Hari ke 2 Suhu 35±2°C**

$$\begin{aligned} \text{Sineresis (\%)} &= \frac{49,84 \text{ g} - 49,70 \text{ g}}{49,84 \text{ g}} \times 100\% \\ &= 0,28\% \end{aligned}$$

**Hari ke 3 Suhu 5±2°C**

$$\begin{aligned} \text{Sineresis (\%)} &= \frac{50,73 \text{ g} - 50,72 \text{ g}}{50,73 \text{ g}} \times 100\% \\ &= 0,02\% \end{aligned}$$

**Hari ke 3 Suhu 35±2°C**

$$\begin{aligned} \text{Sineresis (\%)} &= \frac{49,70 \text{ g} - 49,53 \text{ g}}{49,70 \text{ g}} \times 100\% \\ &= 0,34\% \end{aligned}$$

$$\text{Total sineresis suhu } 5\pm 2^\circ\text{C} = 0,08\%$$

$$\text{Total sineresis suhu } 35\pm 2^\circ\text{C} = 1\%$$

Lampiran 12 Alat dan bahan



Oven



Hotplate



Penangas air



Viskometer



Grinder



Timbangan analitik



Rotary Evaporator



pH meter



Homogenizer



Inkubator



HPMC



CMC-Na



MetilParaben



Propilen glikol



HCl Pekat



Aquadest



Serbuk Mg



Dragendorff



Mayer



FeCl<sub>3</sub>



Lampiran 13 Dokumentasi lain-lain



Proses pemisahan daun dengan batang



Proses pengeringan



Proses penghalusan daun



Proses pengayakan



Proses ekstraksi



Proses filtrasi



Proses evaporasi



Proses pengentalan ekstrak



Hasil serbuk simplisia



Hasil ekstrak kental



Hasil sediaan 5 formula



Hasil sediaan formula optimum

Lampiran 14 Sertifikat analisis propilen glikol




**HASIL PEMERIKSAAN**

Nama Bahan : Propylene Glycol  
 No Batch : J 0041/18 (C815HBK22T)  
 Ex : Dow Chemical Pacific, Singapore  
 E.D. : 11/2025  
 Grade : Farma

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Jenis Pemeriksaan	Persyaratan USP NF 19	Hasil
Pemerian	Cairan kental jernih, tidak berwarna, tidak berbau, rasa agak manis, hygrokopik	Sesuai
Kelarutan	Dapat bercampur dgn air, dengan etanol dan dengan kloroform	Sesuai
Keasam-basaan	≤ 0,3 ml NaOH 0.1N	0,2 ml NaOH 0,1 N
Index Bias	1,431 - 1,433	1,433
Bobot per-ml	1,035 g - 1,037 g/ml	1,0364 g/ml
pH	±6,5	7,476

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**Kesimpulan : Memenuhi Syarat**

Cikarang, 22 – 01 – 2022

Pemeriksa



**Aptria Wariski**  
Staff QC

Penanggung Jawab



**Dra. Tri Hartati**  
Apoteker  
STRA : 18000421/STRA-ITB/1864/20192

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 SUB-BRANCH OFFICE :  
 \* TANGERANG : BLOK 01, CILINDANG, CIRESON, TANGERANG, BLOK 2, PURWOCORONO, TIGAH, MALANG, BONGKONG, DENPASAR, PALU, BANGGAL, BANGGALAN  
 The National Chemicals and Ingredients Distributor

## Lampiran 15 Sertifikat analisis etanol 96%

PT. INDO CLASSICA

## CERTIFICATE OF ANALYSIS

Product Name : Solvent Ethanol Teknik  
 Reg. Number : V. 501  
 Lot Number : 5 / 501 / 2208195445  
 Issued : Agustus 2020


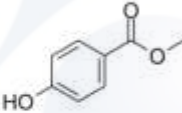
No	Test Item	Unit	Test Method	Specification	Result
1	Appearance	-	Visual	Clear	Clear
2	Purity	wt%	Alcoholmeter	Min. 96	96
3	Water Content	wt%	ASTM E1064 - 12	Max 0.1	0.009
4	Specific Gravity at 20°C		ASTM D4052 - 11	0.7910 - 0.7930	0.792
5	Colour	Hazen	ASTM D1209 - 05	Max 15	0
6	Acetone Content	mg / kg	IMPCA 001 - 09	Max 30	LT 30
7	Acidity (As Acetic Acid) / Free Acid	wt%	ASTM D1613 - 06	Max 0.003	LT 0.003
8	Hydrocarbons		ASTM D1722 - 09	-	Pass
9	Carbonisable Substances	Pt - Cu	ASTM E346 - 08	Max 30	LT 15
10	Distillation Range at 760 mmHg	°C	ASTM D1078 - 11	Max 1	-
	IBP	°C	ASTM D1078 - 11		64.3
	DP	°C	ASTM D1078 - 11		64.9
11	Non Volatile Matter / Residue On Evaporation	mg / 100 ml	ASTM D1353 - 13	Max 1	LT 0.8
12	Permanganate (15°C)	Minutes	ASTM D1363 - 06	Min. 60	>60
13	Sulfur	mg / kg	ASTM D5453 - 09	Max 0.5	LT 0.5
14	Iron	mg / kg	ASTM E394 - 09	Max 0.1	LT 0.1
15	Chloride	mg / kg	IMPCA 002 - 96	Max 0.5	LT 0.5
16	Odor	-	ASTM E346 - 08	Odor Free	Odor Free

Note : The analysis result are only for internal purposes


Verified By,

Quality Control

## Lampiran 16 Sertifikat analisis metilparaben

		Certificate of Analysis	
<p style="text-align: right;">Inhibitors • Screening Libraries • Proteins</p>			
<b>Methyl Paraben</b>			
Cat. No.:	HY-N0349		
CAS No.:	99-76-3		
Batch No.:	33250		
Chemical Name:	Benzoic acid, 4-hydroxy-, methyl ester		
<b>PHYSICAL AND CHEMICAL PROPERTIES</b>			
Molecular Formula:	C <sub>8</sub> H <sub>8</sub> O <sub>3</sub>		
Molecular Weight:	152.15		
Storage:	Powder	-20°C	3 years
		4°C	2 years
	In solvent	-60°C	6 months
		-20°C	1 month
Chemical Structure:			
<b>ANALYTICAL DATA</b>			
Appearance:	White to off-white (Solid)		
<sup>1</sup> H NMR Spectrum:	Consistent with structure		
Purity (HPLC):	99.71%		
Conclusion:	The product has been tested and complies with the given specifications.		
<p>Caution: Product has not been fully validated for medical applications. For research use only.</p> <p>Tel: 609-228-6898      Fax: 609-228-5909      E-mail: tech@MedChemExpress.com            Address: 1 Deer Park Dr, Suite Q, Monmouth Junction, NJ 08852, USA</p>			
Page 1 of 1		www.MedChemExpress.com	

## Lampiran 17 Sertifikat analisis HPMC

  
**Certificate of Analysis**  
 (Representative Sample Certificate)

**Product Name:** Hydroxypropyl Methylcellulose  
**INCI Name:** Hydroxypropyl methylcellulose  
**CAS Number:** 9004-65-3  
**Lot Number:** Not available (data may vary slightly with different lots or batches)  
**Expiration Date:** 36 months from production date

Analytical Tests	Specification	Analysis
Appearance	Off-white to yellowish powder	pass
Odor	Characteristic	pass
Viscosity, 2% in water at 20°C	60,000-90,000	83,921
Moisture as packaged	<7.0%	2.5
Sodium Chloride	<5.0%	0.4
Particle Size, thru 40 U.S. Std. Sieve	>99	100

The above data were obtained using the test indicated and is subject to the deviation inherent in the test method. Results may vary under other test methods or conditions.

This report is not to be signed.

**Disclaimer:** This information relates only to the specific material designated and may not be valid for such material used in combination with any other materials or in any other process. Such information is to be the best of the company's knowledge and believed accurate and reliable as of the date indicated. However, no representation, warranty or guarantee of any kind, express or implied, is made as to its accuracy, reliability or completeness and we assume no responsibility for any loss, damage or expense, direct or consequential, arising out of use. It is the user's responsibility to satisfy himself as to the suitability & completeness of such information for his own particular use.

**MakingCosmetics.com Inc.**  
 35318 SE Center Street, Snoqualmie, WA 98065  
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Lampiran 18 Sertifikat analisis CMC-Na


**HEAD OFFICE :**  
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**PLANT SITE :**  
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 TEL : + (62) (21) 8934311 - 12  
 FAX : + (62) (21) 8933753, 8934364  
 www.arbecem.com

**PT. ARBE CHEMINDO**

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**CERTIFICATE OF ANALYSIS**




**ARBECEL F - 400 P**

LOT NO. : 1217F147A  
 PRODUCTION DATE : December 08, 2021  
 EXPIRY DATE : December 08, 2024  
 SHELF LIFE : If stored under dry and clean conditions in its original packaging, the product has along shelf time.

On the, which the consignment is a part, the following value were determined . They conform to the agreed product specification.

Item Of Analysis	Method	Result	Spec
1. Viscosity, 1% solution, 25 °C, Aquadest, 30 rpm, dry basis, spdl 2.	ASTM D 1439 - 15	440	200 - 600 cps
2. Moisture ( as packed )	ASTM D 1439 - 15	7,0%	10% max.
3. Purity (dry basis)	-	99,60%	99.5% min.
4. DS	ASTM D 1439 - 15	0,82	0.65 - 0.85
5. pH- Value	HOECHST 9010	7,45	6.5 - 7.5
6. Bulk Density ( BD )	-	610 Kg/M3	400 min.

The above particulars do not release the customer from the obligation to carry out an inspection of good received.



**PT. ARBE CHEMINDO**  
 Yon Narius - QC  
 QC. Head Of Dept.

Form No. / 1503-172-0201