

Lampiran 1

SURAT PERMOHONAN PENELITIAN DI LABORATORIUM

Hal: Permohonan Izin Penelitian di Laboratorium

Kepada Yth:
Kepala Laboratorium Pendidikan Kesehatan Terpadu
Universitas Muhammadiyah Lamongan

Assalamu'alaikum Wr. Wb.
Dengan hormat,

Sehubungan dengan penelitian yang akan saya lakukan, maka saya yang bertanda tangan di bawah ini:

Nama : MOCH. RIF'AN AFANDI
Nim : 2002060082
Program Studi : S1 Farmasi
Fakultas : Ilmu Kesehatan
Judul Penelitian : Pengaruh Penambahan Probiotik Dalam Formula Serum Terhadap Aktivitas Antioksidan Dan Stabilitas Fisik

Memohon izin kepada Bapak untuk melakukan penelitian di Laboratorium Pendidikan Kesehatan Terpadu Universitas Muhammadiyah Lamongan.

Demikian surat permohonan ini saya buat.
Atas perhatian Bapak, saya ucapkan terima kasih.

Mengetahui,
Dosen Pembimbing I

Hormat Saya

Apt. Elasari Dwi Pratiwi, M.Farm

Moch. Rif'an Afandi

Menyetujui
Ketua Pelaksana

Mengetahui,
Dosen Pembimbing II

Dr. H. Dadang Kusbiantoro, S.Kep., Ns., M.Si., M.M.

Apt. Dita mayangsari M. Farm

Lampiran 2

LEMBAR KARTU BIMBINGAN

Nama Mahasiswa : Moch. Rif'an Afandi

NIM : 20.02.06.0082

Dosen Pembimbing 1 : apt. Elasari Dwi Pratiwi, M. Farm

No	Hari, Tanggal/Bulan/ Tahun	Kegiatan/Materi Konsultasi	Paraf	
			Pembimbing	Mahasiswa
1.	Selasa 26/September/ 2023	Bab 1 Penyusunan kalimat	el	Hein
2.	Jumat 6/oktober/2023	Bab 1 tanda baca	el	Hein
3	Rabu 11/oktober/2023	Bab 1, 2 Tambah review Probiotik.	el	Hein
4.	Selasa 17/oktober/2023	Bab 1, 2, 3 Formula sediaan alasan Pemilihan	el	Hein
5.	Rabu. 25/oktober/2023	Bab 1, 2, 3. Analisis Data Ditambah, efektivitas Lactobacillus.	el	Hein
6	Senin 31/oktober/ 2023	Bab 1, 2, 3 Modifikasi formula.	el	Hein
7.	Kamis 9/november/ 2023	Bab 2, 3 Formulasi Pembanding	el	Hein

Lampiran 3

LEMBAR KARTU BIMBINGAN

Nama Mahasiswa : Moch. Rifan Afandi

NIM : 20.02.06.0082

Dosen Pembimbing 2 : apt. Fransisca Dita Mayangsari, M. Farm

No	Hari, Tanggal/Bulan/Tahun	Kegiatan/Materi Konsultasi	Paraf	
			Pembimbing	Mahasiswa
1.	Jum'at, 27/oktober/ 2023	Bab 1,2,3 Larutan Pembantu di Samakan Sama Larutan Sediaan		
2.	Senin 06/11/2023	Bab 2,3 Formula Pembantu		
3.	Selasa 7/11/2023	Bab 3 Larutan Pembantu		
4.	RABU 15/11/ 2023	Bab 2,3 kerangka konsep Larutan Pembantu		

Lampiran 4

Perhitungan bahan

F kontrol

$$\text{Vitamin C} : \frac{10}{100} \times 100 = 10 \text{ gr}$$

$$\text{Xantan gum} : \frac{0,4}{100} \times 100 = 0,4 \text{ gr}$$

$$\text{Butilen glikol} : \frac{10}{100} \times 100 = 10 \text{ gr}$$

$$\text{Metil paraben} : \frac{0,3}{100} \times 100 = 0,3 \text{ gr}$$

$$\text{Aqua destilata} : 100 - (10 + 0,4 + 10 + 0,3) = 100 - 20,7 = 79,3$$

F0

$$\text{Xantan gum} : \frac{0,4}{100} \times 100 = 0,4 \text{ gr}$$

$$\text{Butilen glikol} : \frac{10}{100} \times 100 = 10 \text{ gr}$$

$$\text{Metil paraben} : \frac{0,3}{100} \times 100 = 0,3 \text{ gr}$$

$$\text{Aqua destilata} : 100 - (0,4 + 10 + 0,3) = 100 - 10,7 = 89,3$$

F1

$$\text{Probiorik} : \frac{1}{100} \times 100 = 1 \text{ gr}$$

$$\text{Xantan gum} : \frac{0,4}{100} \times 100 = 0,4 \text{ gr}$$

$$\text{Butilen glikol} : \frac{10}{100} \times 100 = 10 \text{ gr}$$

$$\text{Metil paraben} : \frac{0,3}{100} \times 100 = 0,3 \text{ gr}$$

$$\text{Aqua destilata} : 100 - (1 + 0,4 + 10 + 0,3) = 100 - 11,7 = 88,3$$

F2

$$\text{Probiorik} : \frac{2}{100} \times 100 = 2 \text{ gr}$$

$$\text{Xantan gum} : \frac{0,4}{100} \times 100 = 0,4 \text{ gr}$$

$$\text{Butilen glikol} : \frac{10}{100} \times 100 = 10 \text{ gr}$$

$$\text{Metil paraben : } \frac{0,3}{100} \times 100 = 0,3 \text{ gr}$$

$$\text{Aqua destilata : } 100 - (2 + 0,4 + 10 + 0,3) = 100 - 12,7 = 87,3$$

F3

$$\text{Probiorik : } \frac{4}{100} \times 100 = 4 \text{ gr}$$

$$\text{Xantan gum : } \frac{0,4}{100} \times 100 = 0,4 \text{ gr}$$

$$\text{Butilen glikol : } \frac{10}{100} \times 100 = 10 \text{ gr}$$

$$\text{Metil paraben : } \frac{0,3}{100} \times 100 = 0,3 \text{ gr}$$

$$\text{Aqua destilata : } 100 - (4 + 0,4 + 10 + 0,3) = 100 - 14,7 = 85,3$$

Lampiran 5

Perhitungan uji aktivitas antioksidan

1. Perhitungan Larutan DPPH 50 ppm (50 mL)

$$50 \text{ ppm} = \frac{50 \text{ mg}}{1000 \text{ ml}}$$

$$\frac{50 \text{ mg}}{1000 \text{ ml}} = \frac{x \text{ mg}}{50 \text{ ml}}$$

$$X = \frac{2500 \text{ mg/ml}}{1000 \text{ ml}}$$

$$= 2,5 \text{ mg}$$

Di timbang DPPH sebanyak 2,5 mg, lalu ditambahkan ethanol p.a ad 50 mL dalam labu ukur 50 mL

2. perhitungan larutan induk sampel sampel Formula Kontrol, Formula 1, Formula 2, Formula 3

(100 ppm)

$$100 \text{ ppm} = \frac{100 \text{ mg}}{1000 \text{ ml}}$$

$$\frac{100 \text{ mg}}{1000 \text{ ml}} = \frac{x \text{ mg}}{50 \text{ ml}}$$

$$X = \frac{5000 \text{ mg/ml}}{1000 \text{ ml}}$$

$$= 5 \text{ mg.}$$

Di timbang masing masing sampel sebanyak 5 mg lalu ditambahkan ethanol p.a ad 50 mL di dalam labu ukur 50 mL

3. perhitungan larutan seri 2, 4, 6, 8, 10 ppm sampel Formula Kontrol, Formula 1, Formula 2, Formula 3

Larutan seri 2 ppm (10 mL)

$$V1 \times M1 = V2 \times M2$$

$$V1 \times 100 \text{ ppm} = 10 \text{ mL} \times 2 \text{ ppm}$$

$$V1 = \frac{10 \text{ mL} \times 2 \text{ ppm}}{100 \text{ ml}}$$

$$V1 = 0,2 \text{ mL}$$

Di pipet sampel sampel Formula Kontrol, Formula 0 Formula 1, Formula 2, Formula 3 sebanyak 0,2 mL, lalu di tambahkan ethanol p.a ad 10 mL di dalam labu ukur 10 mL.

Larutan seri 4 ppm (10 mL)

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

$$V_1 \times 100 \text{ ppm} = 10 \text{ mL} \times 4 \text{ ppm}$$

$$V_1 = \frac{10 \text{ mL} \times 4 \text{ ppm}}{100 \text{ ml}}$$

$$V_1 = 0,4 \text{ mL}$$

Di pipet sampel Formula Kontrol, Formula 0, Formula 1, Formula 2, Formula 3 sebanyak 0,4 mL, lalu di tambahkan ethanol p.a ad 10 mL di dalam labu ukur 10 mL.

Larutan seri 6 ppm (10 mL)

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

$$V_1 \times 100 \text{ ppm} = 10 \text{ mL} \times 6 \text{ ppm}$$

$$V_1 = \frac{10 \text{ mL} \times 6 \text{ ppm}}{100 \text{ ml}}$$

$$V_1 = 0,6 \text{ mL}$$

Di pipet sampel Formula Kontrol, Formula 1, Formula 2, Formula 3 sebanyak 0,6 mL, lalu di tambahkan ethanol p.a ad 10 mL di dalam labu ukur 10 mL.

Larutan seri 8 ppm (10 mL)

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

$$V_1 \times 100 \text{ ppm} = 10 \text{ mL} \times 8 \text{ ppm}$$

$$V_1 = \frac{10 \text{ mL} \times 8 \text{ ppm}}{100 \text{ ml}}$$

$$V_1 = 0,8 \text{ mL}$$

Di pipet sampel Formula Kontrol, Formula 1, Formula 2, Formula 3 sebanyak 0,8 mL, lalu di tambahkan ethanol p.a ad 10 mL di dalam labu ukur 10 mL.

Larutan seri 10 ppm (10 mL)

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

$$V_1 \times 100 \text{ ppm} = 10 \text{ mL} \times 10 \text{ ppm}$$

$$V1 = \frac{10 \text{ mL} \times 10 \text{ ppm}}{100 \text{ mL}}$$

$$V1 = 1 \text{ mL}$$

Di pipet sampel Formula Kontrol, Formula 1, Formula 2, Formula 3 sebanyak 1 mL, lalu di tambahkan ethanol p.a ad 10 mL di dalam labu ukur 10 mL.

Lampiran 6

Hasil SPSS

Daya sebar

Tests of Normality							
	Formula	Kolmogorov-Smirnov ^a			Shapiro-Wilk		
		Statistic	df	Sig.	Statistic	df	Sig.
Daya sebar	F1 (Pr 1%)	.238	3	.	.976	3	.702
	F2 (Pr 2%)	.319	3	.	.885	3	.339
	F3 (Pr 4%)	.306	3	.	.905	3	.402

a. Lilliefors Significance Correction

Ketentuan :

Sig >0,05 = Normal

Hasil :

Nilai sig = >0,05

Kesimpulan :

Data terdistribusi secara normal

Test of Homogeneity of Variances					
		Levene Statistic	df1	df2	Sig.
Daya sebar	Based on Mean	3.542	2	6	.096
	Based on Median	.551	2	6	.603
	Based on Median and with adjusted df	.551	2	3.967	.615
	Based on trimmed mean	3.121	2	6	.118

Ketentuan :

Sig >0,05 = Homogen

Hasil :

Nilai sig = 0.118 (>0,05)

Kesimpulan :

Terdapat data terdistribusi homogen, sehingga pengujian dilakukan menggunakan One Way Anova.

ANOVA

Daya sebar

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	.171	2	.085	2.237	.188
Within Groups	.229	6	.038		
Total	.400	8			

Ketentuan :

Sig <0,05 = terdapat perbedaan bermakna antar formula

Hasil :

Nilai sig = 0,118 (>0,05)

Kesimpulan :

Tidak terdapat perbedaan bermakna.

Viskositas

Tests of Normality

	Formula	Kolmogorov-Smirnov ^a			Shapiro-Wilk		
		Statistic	df	Sig.	Statistic	df	Sig.
Viskositas	F1 (Pr 1%)	.292	3	.	.923	3	.463
	F2 (pr 2%)	.304	3	.	.907	3	.407
	F3 (pr 4%)	.292	3	.	.923	3	.463

a. Lilliefors Significance Correction

Ketentuan :

Sig >0,05 = Normal

Hasil :

Nilai sig = >0,05

Kesimpulan :

Data terdistribusi secara normal

Test of Homogeneity of Variances					
		Levene Statistic	df1	df2	Sig.
Viskositas	Based on Mean	2.512	2	6	.161
	Based on Median	.472	2	6	.645
	Based on Median and with adjusted df	.472	2	3.470	.659
	Based on trimmed mean	2.249	2	6	.187

Ketentuan :

Sig >0,05 = Homogen

Hasil :

Nilai sig = 0.187(>0,05)

Kesimpulan :

Terdapat data terdistribusi homogen, sehingga pengujian dilakukan menggunakan One Way Anova.

ANOVA

Viskositas

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	1458.813	3	486.271	325.628	.000
Within Groups	11.947	8	1.493		
Total	1470.760	11			

Ketentuan :

Sig <0,05 = terdapat perbedaan bermakna antar formula

Hasil :

Nilai sig = 0,000 (<0,05)

Kesimpulan :

Terdapat perbedaan bermakna antar formula sehingga dilakukan post hoc tukey.

Viskositas

	Formula	N	Subset for alpha = 0.05		
			1	2	3
Tukey B ^a	F2 (Pr 4%)	3	272.267		
	F2 (Pr 2%)	3		282.133	
	F1 (Pr 1%)	3			291.067

Means for groups in homogeneous subsets are displayed.

a. Uses Harmonic Mean Sample Size = 3.000.

Hasil :

ketiga formula menempati subset yang berbeda

Kesimpulan :

Ketiga formula secara signifikan adalah berbeda bermakna

Uji pH

Tests of Normality							
	Formula	Kolmogorov-Smirnov ^a			Shapiro-Wilk		
		Statistic	Df	Sig.	Statistic	df	Sig.
pH	F1 (Pr 1%)	.328	3	.	.871	3	.298
	F2 (Pr 2%)	.253	3	.	.964	3	.637
	F3 (Pr 4%)	.175	3	.	1.000	3	1.000

a. Lilliefors Significance Correction

Ketentuan :

Sig >0,05 = Normal

Hasil :

Nilai sig = >0,05

Kesimpulan :

Data terdistribusi secara normal

Test of Homogeneity of Variances

		Levene Statistic	df1	df2	Sig.
pH	Based on Mean	3.525	2	6	.097
	Based on Median	.520	2	6	.619
	Based on Median and with adjusted df	.520	2	2.772	.643
	Based on trimmed mean	3.128	2	6	.117

Ketentuan :

Sig >0,05 = Homogen

Hasil :

Nilai sig = 0.117 (>0,05)

Kesimpulan :

Terdapat data terdistribusi homogen, sehingga pengujian dilakukan menggunakan One Way Anova.

ANOVA

pH	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	.001	2	.000	.902	.454
Within Groups	.003	6	.000		
Total	.004	8			

Ketentuan :

Sig <0,05 = terdapat perbedaan bermakna antar formula

Hasil :

Nilai sig = 0,454 (>0,05)

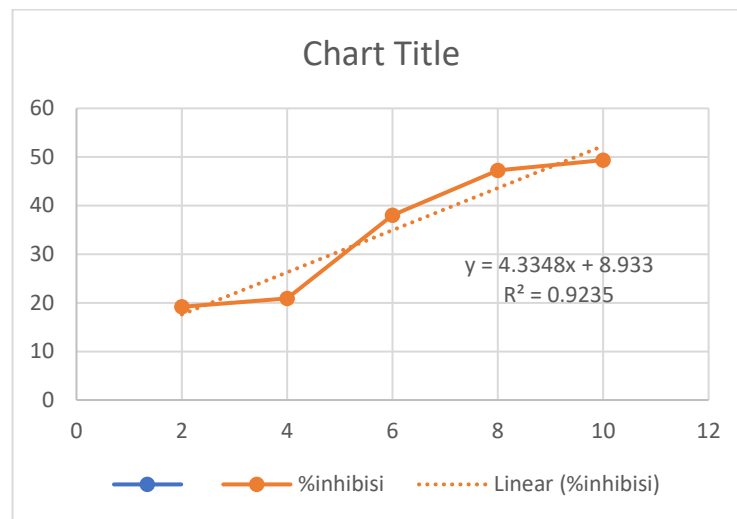
Kesimpulan :

Tidak terdapat perbedaan bermakna.

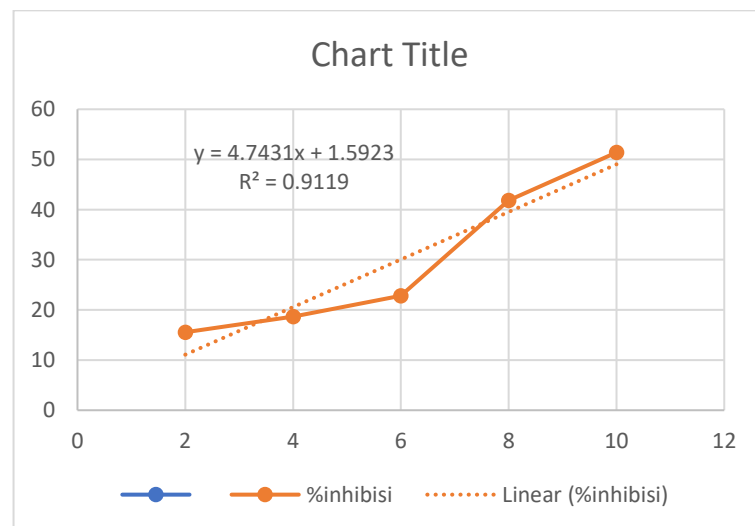
Lampiran 7

Grafik Hubungan Antara Konsentrasi Dengan Persen Inhibisi Uji Aktivitas Antioksidan

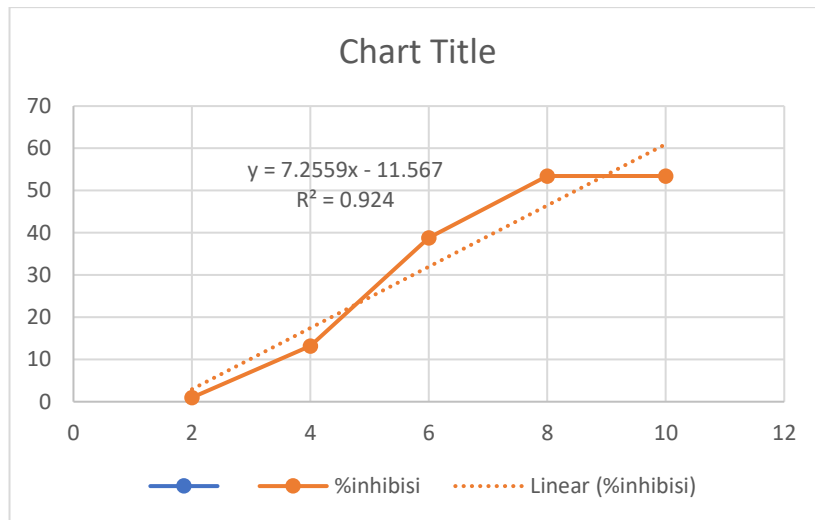
Grafik hubungan antara konsentrasi dan persen inhibisi pada formula kontrol



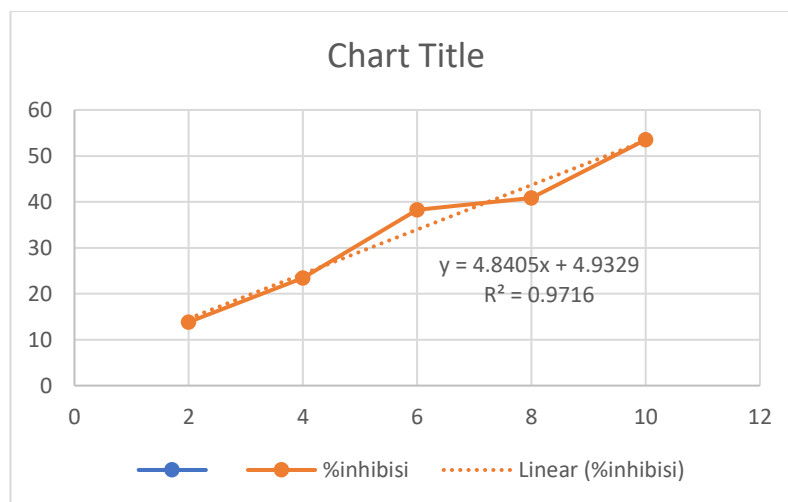
Grafik hubungan antara konsentrasi dan persen inhibisi pada formula 1



Grafik hubungan antara konsentrasi dan persen inhibisi pada formula 2



Grafik hubungan antara konsentrasi dan persen inhibisi pada formula 3



Lampiran 8

Perhitungan IC₅₀

Kontrol +

$$\frac{0.7133-0.5765}{0.7133} \times 100\% = 19.1784\%$$

$$\frac{0.7133-0.5641}{0.7133} \times 100\% = 20.9168\%$$

$$\frac{0.7133-0.4422}{0.7133} \times 100\% = 38.0064\%$$

$$\frac{0.7133-0.3763}{0.7133} \times 100\% = 47.2451\%$$

$$\frac{0.7133-0.3612}{0.7133} \times 100\% = 49.3621\%$$

$$\text{IC}_{50} : y = a + bx$$

$$50 = 8.933 + 4.3348x$$

$$x = \frac{50-8.933}{4.3348}$$

$$x = 9.47 \text{ ppm}$$

Formula probiotik 1%

$$\frac{0.7241-0.6115}{0.7241} \times 100\% = 15.5503\%$$

$$\frac{0.7241-0.5890}{0.7241} \times 100\% = 18.6576\%$$

$$\frac{0.7241-0.5589}{0.7241} \times 100\% = 22.8145\%$$

$$\frac{0.7241-0.4211}{0.7241} \times 100\% = 41.8450\%$$

$$\frac{0.7241-0.3520}{0.7241} x 100\% = 51.3879\%$$

$$IC_{50} : y = a + bx$$

$$50 = 1.5923 + 4.7431x$$

$$x = \frac{50-1.5923}{4.7431}$$

$$x = 10.20 \text{ ppm}$$

Formula probiotik 2%

$$\frac{0.7241-0.7170}{0.7241} x 100\% = 0.9805\%$$

$$\frac{0.7241-0.6284}{0.7241} x 100\% = 13.2164\%$$

$$\frac{0.7241-0.4432}{0.7241} x 100\% = 38.7929\%$$

$$\frac{0.7241-0.3374}{0.7241} x 100\% = 53.4052\%$$

$$\frac{0.7241-0.3371}{0.7241} x 100\% = 53.4456\%$$

$$IC_{50} : y = a + bx$$

$$50 = 11.567 - 7.2559x$$

$$x = \frac{50 - 11.567}{7.2559}$$

$$x = 8.48 \text{ ppm}$$

Formula Probiotik 4%

$$\frac{0.7241-0.6240}{0.7241} x 100\% = 13.8240\%$$

$$\frac{0.7241-0.5544}{0.7241} x 100\% = 23.4359\%$$

$$\frac{0.7241-0.4472}{0.7241} x \text{ 100\%} = \mathbf{38.2405\%}$$

$$\frac{0.7241-0.4282}{0.7241} x \text{ 100\%} = \mathbf{40.8645\%}$$

$$\frac{0.7241-0.3366}{0.7241} x \text{ 100\%} = \mathbf{53.5147\%}$$

$$\text{IC50 : } y = a + bx$$

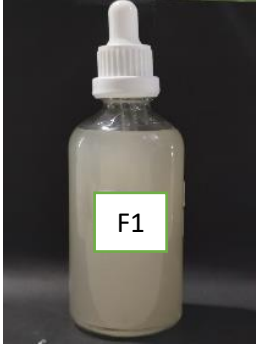
$$50 = 4.9329 + 4.8405x$$

$$x = \frac{50-4.9329}{4.8405}$$

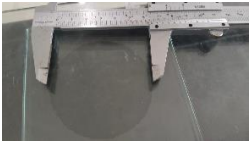
$$x = 9.31 \text{ ppm}$$

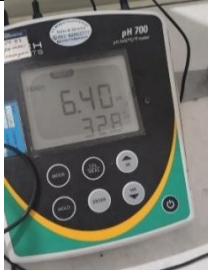
Lampiran 9

Hasil karakteristik fisik

Pengujian Organoleptis	Dokumentasi	
Formula 1		
Formula 2		
Formula 3		

Pengujian	Dokumentasi	
Homogenitas		
Formula 1		
Formula 2		
Formula 3		

Pengujian	Dokumentasi		
Daya sebar	Replikasi		
	1	2	3
Formula 1			
Formula 2			
Formula 3			

Pengujian	Dokumentasi		
Uji pH	Replikasi		
	1	2	3
Formula 1			
Formula 2			
Formula 3			

Pengujian	Dokumentasi		
Viskositas	Replikasi		
	1	2	3
Formula 1			
Formula 2			
Formula 3			

Lampiran 10



Certificate of Analysis

(Representative Sample Certificate)

Product Name: Xanthan Gum, Prehydrated
INCI Name: Xanthan Gum
CAS Number: 11138-66-2
Lot Number: Not available (data may vary slightly with different lots or batches)
Expiration Date: 36 months from production date

Characteristics	Standards	Lab Results	
		Pass	Comments
Bacteriological			
Aerobic Plate Count	<2000 cfu	Yes	<2000 cfu
Total confirmed Coliforms	<30 /g	Yes	<30 /g
E. Coli (Typical)	Negative	Yes	Negative
Salmonella (Typical)	Negative	Yes	Negative
Staph. Aureus-BAM	Negative /10g	Yes	Negative /10g
Yeast and Mold (Typical)	<200 /g	Yes	<200 /g
Particle Size			
SS#80 mesh-ON	80-100	Yes	98.2%
SS#40 mesh-ON	20-65	Yes	26.9%
Physical and Chemical			
Powder Color	Cream	Yes	Cream
Flavor	Typical Bland	Yes	Typical Bland
Moisture	0-15%	Yes	9.29%
Odor	Characteristic	Yes	Characteristic
pH (viscosity solution)	5-8.1	Yes	5.85 pH
Texture (qualitative)	Free flowing powder	Yes	Free flowing powder
Viscosity (1.0%,KCL,LV@60rpm,25° C)	1400-2000 cps	Yes	1710 cps

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.
 10800 231st Way NE, Redmond, WA 98053
 Phone 425-292-9502 Fax 425-292-9601 www.makingcosmetics.com

Lampiran 11



Certificate of Analysis

Inhibitors • Screening Libraries • Proteins

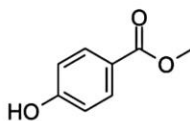
Methyl Paraben

Cat. No.: HY-N0349
 CAS No.: 99-76-3
 Batch No.: 33250
 Chemical Name: Benzoic acid, 4-hydroxy-, methyl ester

PHYSICAL AND CHEMICAL PROPERTIES

Molecular Formula: $C_8H_8O_3$
 Molecular Weight: 152.15
 Storage: Powder -20°C 3 years
 4°C 2 years
 In solvent -80°C 6 months
 -20°C 1 month

Chemical Structure:



ANALYTICAL DATA

Appearance: White to off-white (Solid)
 1H NMR Spectrum: Consistent with structure
 Purity (HPLC): 99.71%
 Conclusion: The product has been tested and complies with the given specifications.

Caution: Product has not been fully validated for medical applications. For research use only.

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

Lampiran 12



CERTIFICATE OF ANALYSIS

L-Ascorbic Acid ($C_6H_8O_6$) EP/BP/USP/FCC/E300

Test Items		Test parameters	Test Results
1	Characteristics	White almost white crystals or crystalline powder	White crystallin powder
2	Identification	Positive	Positive
3	Melting Point	190°C- 192°C	191°C
4	pH (5% W/V)	2.2 – 2.5	2.4
5	pH (2% W/V)	2.4 – 2.8	2.6
6	Specific Optical Rotation	+20.5° - +21.5°	+21.1°
7	Clarity and color of solution	Clear, Not more intense than BY7	Clear, not more intensely than BY7
8	Heavy Metals	≤ 0.0003%	< 0.0003%
9	Assay (as $C_6H_8O_6$)	99.0% - 100.5%	99.9%
The above items are based on routine batch analysis.			
11	Copper (ppm)	≤ 3	< 3
12	Iron (ppm)	≤ 2	< 2
13	Mercury (ppm)	≤ 1	< 1
14	Arsenic	≤ 0.0002%	< 0.0002%
15	Lead	≤ 0.0002%	< 0.0002%
16	Oxalic Acid (Impurity E)	≤ 0.2%	< 0.2%
17	Loss on drying	≤ 0.1%	< 0.1%
18	Sulphated Ash	≤ 0.1%	< 0.1%
19	Related Substances	Impurity C ≤ 0.15% Impurity D ≤ 0.15% Unspecified Impurities ≤ 0.10% Total ≤ 0.2%	< 0.15% < 0.15% < 0.10% < 0.2%
20	Residual Solvents (as Methanol) (ppm)	≤ 3000	< 3000
21	Total Plate Count (cfu/g)	≤ 1000	< 1000
22	Yeast & Molds (cfu/g)	≤ 100	< 100
23	Escherichia Coli	Absence in 1g	Absence in 1g
24	Salmonella	Absence 25g	Absence in 25g
25	Staphylococcus Aureus	Absence in 25g	Absence in 25g

Lampiran 13

CERTIFICATE OF ANALYSIS

Product Name	: AQUADEST	Molecular Weight	: 18.02 g/mol
Catalog No.	: A-1078	Batch No.	: 110518007
Grade	: Laboratory Reagent	Manufacturing Date	: December, 2022
Formula	: H ₂ O	Expire Date	: December, 2027
Cas No	: 7732 – 18 - 5		

NO.	ITEM TEST	UNITS	SPECIFICATION	RESULT
1.	Appearance	–	Clear and free of visible particulate	Passes test
2.	Conductivity at 25 °C	uS/cm	≤ 1.0	0.18
3.	pH at 25 °C	–	5.0 – 7.5	7.1
4.	Turbidity	NTU	≤ 0.5	< 0.5
5.	Total Dissolve Solid (TDS)	ppm	≤ 0.5	0.09
6.	Residu on evaporation	ppm	≤ 1.0	NIL
7.	Total Organic Carbon (TOC)	ppm	≤ 50	< 50
8.	Total Hardness	ppm	≤ 0.1	NIL
9.	Chloride (Cl)	ppm	≤ 0.5	0.35
10.	Silica (as SiO ₂)	ppm	≤ 0.5	< 0.1
11.	Iron (Fe)	ppm	≤ 0.1	0.0375
12.	Aromatic Hydrocarbon	ppm	Free of Hydrocarbon	NIL

Lampiran 14


PT. SMART-LAB INDONESIA
 MANUFACTURER OF ANALYTICAL REAGENTS



CERTIFICATE OF ANALYSIS

Product Name : Ethanol (Absolute)	Molecular Weight : 46.07 g/mol
Catalog No. : A-1035	Batch No. : 100222002
Grade : Analytical Reagent	Manufacturing Date : February 10, 2022
Formula : C ₂ H ₅ OH	Expire Date : February, 2027
Cas No : 64-17-5	

NO	ITEM TEST	UNITS	SPECIFICATION	RESULT
1.	Appearance	—	Clear colorless liquid	Clear colorless liquid
2.	Assay (Alcoholmeter)	wt %	min 99.7	99.939
3.	Wt. Per ml at 20 °C	g/cm ³	0.789 – 0.792	0.790
4.	Colour	Hazen	max 10	< 10
5.	Refractive Index	n _D ²⁰	1.358 – 1.363	1.360
6.	Water (H ₂ O)	wt %	max 0.2	0.0870
7.	Non-volatile matter	wt %	max 0.001	0.00076
8.	Acidity (CH ₃ COOH)	wt %	max 0.0006	0.00019
9.	Alkalinity (NH ₃)	wt %	max 0.0002	0.00012
10.	Acetone, isopropyl alcohol	—	passes test	passes test
11.	Methanol (CH ₃ OH)	wt %	max 0.1	NIL
12.	Iron (Fe)	wt %	max 0.00002	< 0.00002
13.	Lead (Pb)	wt %	max 0.00005	< 0.00005
14.	Solubility in water	—	passes test	passes test
15.	Substances darkened (by H ₂ SO ₄)	—	passes test	passes test
16.	Substances Reducing KMnO ₄	—	passes test	passes test

Result : The above product corresponds to AR Grade

Reference or standard of product specification to Analar standard and ACS specification

PT. SMART LAB INDONESIA



SUDIRO S.Si
Head QC

Ruko Boulevard Timor Blok E No. 10 - 11 BSD Sektor 10 Serpong Tangerang - Indonesia
 Telp : (62-21) 7588 0205, Fax : (62-21) 7588 0198 Website: www.smartlab.co.id Email : sales@smartlab.co.id

Lampiran 15

08/02/2023(JST)



Certificate of Analysis

TOKYO CHEMICAL INDUSTRY CO., LTD.
 4-10-1 Nihonbashi-Honcho, Chuo-ku, Tokyo 103-0023 Japan

Chemical Name: 1,1-Diphenyl-2-picrylhydrazyl Free Radical			
Product Number: D4313	Lot: U6GJC		
CAS RN: 1890-06-4			

Tests	Results	Specifications
Appearance	Black powder	Black powder to crystal
Purity(HPLC)	99.0 area%	min. 97.0 area%

TCI Lot numbers are 4-5 characters in length. Characters listed after the first 4-5 characters are control numbers for internal purpose only.
 The contents of the specifications are subject to change without advance notice. The specification values displayed here are the most up to date values. There may be cases where the product labels display a different specification, however, the product quality still meets the latest specification.

Customer Service:
 TOKYO CHEMICAL INDUSTRY CO., LTD
 E-mail: globalbusiness@TCIchemicals.com


 Takuya Nishioka
 Quality Assurance Department Manager

Lampiran 16

Hasil Uji Deskriptif Stabilitas

Uji pH

Descriptive Statistics					
	N	Minimum	Maximum	Mean	Std. Deviation
pH	28	5.20	6.40	6.1193	.31741
Valid N (listwise)	28				

Hasil uji deskriptif pada pH didapatkan :

Nilai minimum pH selama 90 hari sebesar 5,20

Nilai maximum pH selama 90 hari sebesar 6,40

Rata rata uji pH pada stabilitas selama 90 hari sebesar 6,1193

Standar deviasinya sebesar 0,31741

Uji daya sebar

Descriptive Statistics					
	N	Minimum	Maximum	Mean	Std. Deviation
Dayasebaar	28	5.67	6.92	6.4368	.34056
Valid N (listwise)	28				

Hasil uji deskriptif pada Daya Sebar didapatkan :

Nilai minimum daya sebar selama 90 hari sebesar 5,67

Nilai maximum daya sebar selama 90 hari sebesar 6,92

Rata rata uji daya sebar pada stabilitas selama 90 hari sebesar 6,4368

Standar deviasinya sebesar 0,34056

Uji Viskositas

Descriptive Statistics

	N	Minimum	Maximum	Mean	Std. Deviation
viskositas	28	272.26	382.00	340.5275	30.07073
Valid N (listwise)	28				

Hasil uji deskriptif pada viskositas didapatkan :

Nilai minimum viskositas selama 90 hari sebesar 272,26

Nilai maximum viskositas selama 90 hari sebesar 382,00

Rata rata uji viskositas pada stabilitas selama 90 hari sebesar 340,5275

Standar deviasinya sebesar 30,07073