

LAMPIRAN

Lampiran 1 Surat Bebas Plagiasi

SURAT PERNYATAAN

Yang bertanda tangan di bawah ini,

Nama : Andrea Sari

N P M : 11181192

adalah mahasiswa Fakultas Farmasi, Universitas Bhakti Kencana, menyatakan dengan sesungguhnya bahwa Naskah Tugas Akhir/Skripsi yang saya tulis dengan judul:

FORMULASI EMULGEL DARI MINYAK PEGAGAN (*Centella asiatica* L. Urb) YANG BERKHASIAH SEBAGAI ANTIBAKTERI

adalah benar-benar merupakan hasil karya saya sendiri. Apabila di kemudian hari diketahui bahwa isi Naskah Skripsi ini merupakan hasil plagiasi, maka saya bersedia menerima sanksi berupa pembatalan kelulusan dan atau pencabutan gelar yang saya peroleh.

Demikian surat pernyataan ini saya buat untuk dapat dipergunakan sebagaimana mestinya.

Bandung , 08 Agustus 2022

Yang membuat pernyataan,

A handwritten signature in black ink is written over a red circular library stamp. The stamp contains the text 'PUSAT PERPUSTAKAAN' at the top, 'UNIVERSITAS BHAKTI KENCANA' in the middle, and 'METRAL TEMPEL' at the bottom, followed by the number '4F708AJX913052408'.

(Andrea Sari)

NPM 11181192

Lampiran 2 Surat Persetujuan Publikasi

SURAT PERNYATAAN

Yang bertanda tangan di bawah ini,

Nama : Andrea Sari

N P M : 11181192

Menyatakan bahwa demi kepentingan perkembangan ilmu pengetahuan, saya menyetujui abstrak Skripsi yang saya tulis dengan judul:

FORMULASI EMULGEL DARI MINYAK PEGAGAN (*Centella asiatica* L. Urb) YANG BERKHASIAH SEBAGAI ANTIBAKTERI

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Demikian surat pernyataan ini saya buat untuk dapat dipergunakan sebagaimana mestinya.

Bandung , 08 Agustus 2022

Yang membuat pernyataan,

(Andrea Sari)

NPM 11181192

Lampiran 3 Certificate of analysis aquadest

CERTIFICATE OF ANALYSIS

Product Name	: AQUADEST	Molecular Weight	: 18.02 g/mol
Catalog No.	: A-1078	Batch No.	: 060818012
Grade	: Laboratory Reagent	Manufacturing Date	: August 06, 2018
Formula	: H ₂ O	Expire Date	: August, 2023
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	0.16
3.	pH at 25 °C	–	5.0 – 7.5	7.0
4.	Turbidity	NTU	≤ 0.5	< 0.5
5.	Total Dissolve Solid (TDS)	ppm	≤ 0.5	0.08
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	0.0189
11.	Iron (Fe)	ppm	≤ 0.1	0.0380
12.	Aromatic Hydrocarbon	ppm	Free of Hydrocarbon	NIL

Lampiran 4 Certificate of analysis Etanol 96%

Certificate of Analysis
Ethyl Alcohol
(Ethanol)
190 Proof
Technical Grade

<u>Property</u>	<u>Specification</u>	<u>Analysis</u>
Appearance	Clear, Colorless	Pass
Color (APHA)	10 maximum	3
Specific Gravity @ 60° /60° F	To Pass Test	Pass
Density @ 15.6° C.	To Pass Test	Pass
Proof	190	190
Water Content, Volume %	To Pass Test	Pass
Acidity (as Acetic Acid)	To Pass Test	Pass
Components (% by G.C.)		
Ethanol	To Pass Test	Pass
Ethyl Acetate	To Pass Test	Pass
Methanol	To Pass Test	Pass
Methyl Isobutyl Ketone	To Pass Test	Pass
Approved Hydrocarbon	To Pass Test	Pass

Lampiran 5 *Certificate of analysis* triethanolamine

Certificate of Analysis
(Representative Sample Certificate)

Product Name: Triethanolamine
INCI Name: Triethanolamine
CAS Number: 102-71-6
Lot Number: Not available (data may vary slightly with different lots or batches)
Expiration Date: 24 months from production date

Characteristic	Specifications	Results
Appearance	Viscous liquid free of suspended matter	Pass
Specific gravity 20°C	1.1240-1.1270	1.1255
Equivalent weight	148.0-150.0	149.0
Color (APHA)	40 max	6
Sulfate (SO ₄)	<0.002%	<0.002%
Diethanolamine (GC)	<0.5%	<0.5%
Ethanolamine	<0.1%	<0.1%
Assay	99.0 min	99.38
Water	0.2 max	0.10
Odor	Characteristic	Pass
IR (NEAT)	TMS	pass

Lampiran 6 Certificate of analysis Carbopol 940

COREL PHARMA CHEM

THOL ROAD, KADU, 382 15 DIST. MEHSANA, GUJARAT (INDIA)
PHONE: + 91 8000480115 E-MAIL: corelpharma@gmail.com WEBSITE: www.corelpharmachem.com



CERTIFICATE OF ANALYSIS

NAME OF PRODUCT: ACRYPOL 940
(Carbomer 940)

BATCH NO: 11021041

DATE: 27/08/2021

MFG. DATE: AUG.-2021

A.R.NO.: CRL/EP/041/21-22

RETEST DATE: JUL.-2024

The supply as detailed above has been tested and found to meet the requirement as below on sample basis.

TEST	SPECIFICATION*	RESULTS
DESCRIPTION	White, fluffy, hygroscopic powder having a slight, characteristic odor. The pH of 1 in 100 dispersion in water is about 3.	White fluffy, hygroscopic powder having a slight, characteristic odor. The pH of 1 in 100 dispersion in water is about 3.
SOLUBILITY	When neutralize with alkali hydroxide or amine it dissolve in water, alcohol and glycerin.	Complies
IDENTIFICATION	Very viscous gel is produced	Very viscous gel is produced
	10 mg/ml dispersion with Thymol Blue- - Orange Color	Orange color produced
	10 mg/ml dispersion with cresol Red - Yellow Color	Yellow color produced
VISCOSITY (mPa.s) (0.5% aqueous dispersion)	40,000 to 60,000	48,000 mPa.s
LOSS ON DRYING (%)	NMT 2.0	0.74%
LIMIT OF BENZENE (%)	NMT 0.5	Not detected
ASSAY FOR CARBOXYLIC ACID CONTENT (%)	56.0 to 68.0	57.55%

* Specification as per finished product specification [QC/WI/335(06)]. Meeting requirement of USP/NF.

TESTED BY
ALPESH PATEL
(Q.C. Chemist)

CHEMCO
PRIMA MATRI
INDONESIA
WAREHOUSE



AUTHORIZED BY
PRAGNESH RAJAPATI
(In-charge QC)

The Next Generation Polymer Technologist

OFFICE: COREL HOUSE, NR. SHIVRAJ, M. P. ROAD, DPM SHIVRAJ PETROL, PUNE 411 004 (INDIA). PHONE: +91-20-2624411. MOBILE: +91-9800048011. FAX: +91-20-2624411. E-MAIL: corelpharma@gmail.com
ACRYCOAT • COLORCOAT • ACRYPOL • KYRON • ACRYNOL • ACRYFLOW • ACRYSET

Lampiran 7 *Certificate of analysis* Glyserin



WILMAR OLEOCHEMICAL GROUP

MSDS No. : WOG-G-002
First Issued : 01 Feb 2014
Revision No. : 04
Revision Date : 26 May 2015

MATERIAL SAFETY DATA SHEET

1. Produk dan Identifikasi Perusahaan

- a. Nama Produk : Refined Glycerine
b. Kode Produk : WILFARIN USP/ EP / BP 995 / 997
c. Penggunaan Untuk : Bahan baku produk turunan oleochemical
d. Pabrik : **PT. Wilmar Nabati Indonesia**
Jl. Kapten Darmo Sugondo No. 56, Gresik-61124, East Java, Indonesia
Emergency contact : Jusuf Gohanmin
Tlp : +6231-28932231
e-mail : jusuf.goh@id.wilmar-intl.com

2. Identifikasi Bahaya

- a. Klasifikasi Bahan atau Campuran :
Produk ini tidak berbahaya
b. Elemen Label :
• Pictogram : Tidak ada symbol yang dibutuhkan
• Signal words : Tidak berbahaya
• Hazard Statement(s) : Tidak ada
• Peringatan : Gunakan sarung tangan pelindung, pakaian pelindung, pelindung mata, pelindung wajah. Jika terjadi iritasi pada kulit : dapatkan saran medis dan perhatian. Cuci tangan dengan bersih setelah menangani. Lepaskan pakaian yg terkontaminasi dan cuci sebelum digunakan kembali.
c. Bahaya lain yang tidak disebutkan hasilnya dalam klasifikasi : Tidak ada

3. Komposisi

Nama Kimia	Sinonim	Rumus	CAS No.	EC No.
1,2,3-Propanetriol	Glycerine	$C_3H_8O_3$	56-81-5	200-289-5
Aqua	Water	H_2O	7732-18-5	231-791-2

4. Pertolongan pertama

- a. **Kontak dengan Mata**
Segera siram air dengan air yang banyak selama minimal 15 menit, biarkan mata terbuka. Dapatkan bantuan medis segera.
b. **Kontak dengan Kulit**
Cuci kulit dengan menggunakan sabun dan air. Lepaskan baju yang terkontaminasi dan cuci segera.

Lampiran 8 *Certificate of analysis* Butylhidrotoluen

Page: 1 to 2

Certificate of Analysis



Company
LANXESS Deutschland GmbH
Kennedyplatz 1
50569 KÖLN

Date: 24.08.2021

Material description
POLY-BUTYLENE
110556451

Material
1/87059

Customer order data

Your order no. of:
7140050342

Ship-to party
3053830

Your product no.
110556451

Delivery data

Delivery no.	Delivered quantity	Planned delivery date	Order no.	Vehicle ID	Container no.
3017090601 / 000010	10.000.000 KG	27.09.2021	3032938696 / 000010	AC ST 1145	TGHU170069-1
Batch	Delivered quantity	Date of manuf.	Best before		
CHASMZ0713	10.000.000 KG	13.07.2021	13.07.2023		

A sample was taken according to procedure; the result of analysis was:

Inspection method/ Characteristic	Result	Specification	Unit
1) Optical reference: Visual White, crystalline powder	complies	complies	
2) Identity	complies	complies	
3) GC: Active substance content (without residual solvents and water) Phenolic impurities	100.0 <= 0.0	>= 99.8 <= 0.5	% %
4) Solidification Point Solidification point Ash content	 	>= 69.2 <= 20	°C mg/Kg

Lampiran 9 Certificate of analysis tween 80

Certificate of Analysis

Product Name : TWEEN 80
 Lot No. : 4911312
 Manufacturing Date : 13/11/2020
 Expiry Date : 12/11/2022

NO	PARAMETER	UNIT	SPECIFICATION	RESULT
1	Appearance		Yellow liquid	Yellow liquid
2	pH Value, sol. 1%, 25 ⁰ C		5.0 – 7.0	6.2
3	Water Content	% wt	Max. 3.0	0.06
4	Hydroxyl Value	mg KOH/g	65.0 – 80.0	67.4
5	Saponification Value	mg KOH/g	45.0 – 55.0	47.3
6	Color Tone	G no	Max 10.0	2.1

Lampiran 10 Certificate of analysis DMDM hydantoin

PT. Karyo Indonesia
Jl. Cakrawala Km. 4.0 Karsahi Sari
Kec. Cibodas - Tanggerang 13138
Indonesia
Pb. 021-5520300
Fax. 021-5520300/5520304

CLARIANT

Certificate of Analysis

Date: 03.12.2021
Page: 1 / 2

Your order from 24.11.2021

Order No. :

Delivery no./Pos. : 53100851 / 900001

Order : 15351807

Material : NIPAGUARD DMDMH

0025

Material-no. : 17108826806

Batch No. : IDAA117223

In the batch, of which the consignment is a part the following values were
obtained:

Inspection characteristic/-method	Specification	Result
Date of production		02.12.2021
Expiration date, shelf life		02.12.2023
Aspect CCTC0082		Clear solution
Colour CCTC0064		Colourless
Hazen Colour CCTC0079	≤ 10	5
pH DCTC0005	6,5 - 7,5	6,9
Water Content - Karl Fischer CCTC0018	≤ 0,1	44,50 %

Lampiran 11 Dokumentasi penelitian

Pembuatan emulgel



Penimbangan bahan aktif

Sediaan emulgel



Pengujian viskositas

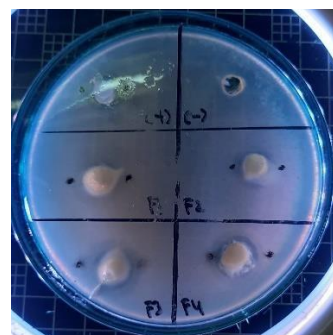
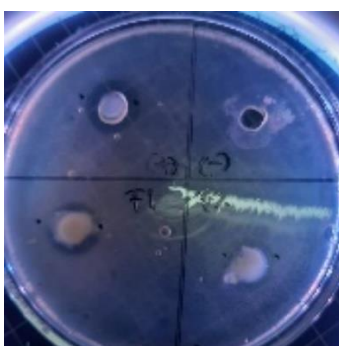


Pengujian pH



Uji stabilitas freeze thaw

Siklus ke-1

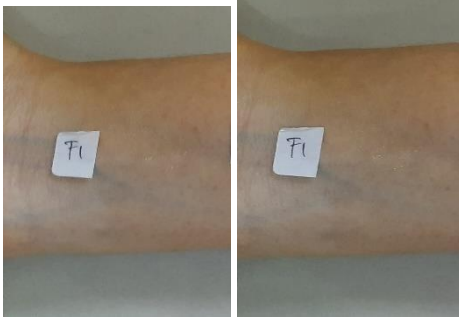


Uji antibakteri pd bakteri S.aureus

Uji antibakteri pada bakteri e.coli



Uji antibakteri zat aktif e.coli

Uji antibakteri zat aktif
S.aureus

Uji iritasi sesudah dan sebelum



Sediaan gel

Lampiran 10 Perhitungan

Tanpa Zat

$$\text{Tween 80} = \frac{10}{100} \times 100 = 10 \text{ g}$$

$$\text{BHT} = \frac{0,1}{100} \times 100 = 0,1 \text{ g}$$

$$\text{Etanol} = \frac{1}{100} \times 100 = 1 \text{ g}$$

$$\text{Karbopol} = \frac{1}{100} \times 100 = 1 \text{ g}$$

$$\text{DmDm} = \frac{0,6}{100} \times 100 = 0,6 \text{ g}$$

$$\text{TEA} = \frac{0,1}{100} \times 100 = 0,1 \text{ g}$$

$$\text{Gliserin} = \frac{15}{100} \times 100 = 15 \text{ g}$$

Aqua

$$= 100 - (10 + 0,1 + 1 + 1 + 0,6 + 0,1 + 15)$$

$$= 100 - 27,8$$

$$= 72,2 \text{ mL}$$

$$\text{Minyak pegagan} = \frac{3}{100} \times 100 = 3 \text{ g}$$

$$\text{Tween 80} = \frac{10}{100} \times 100 = 10 \text{ g}$$

$$\text{BHT} = \frac{0,1}{100} \times 100 = 0,1 \text{ g}$$

$$\text{Etanol} = \frac{1}{100} \times 100 = 1 \text{ g}$$

$$\text{Karbopol} = \frac{1}{100} \times 100 = 1 \text{ g}$$

$$\text{DmDm} = \frac{0,6}{100} \times 100 = 0,6 \text{ g}$$

$$\text{TEA} = \frac{0,1}{100} \times 100 = 0,1 \text{ g}$$

$$\text{Gliserin} = \frac{15}{100} \times 100 = 15 \text{ g}$$

Aqua

$$= 100 - (3 + 10 + 0,1 + 1 + 1 + 0,6 + 0,1 + 15)$$

$$= 100 - 30,8$$

$$= 69,2 \text{ mL}$$

Lampiran 12 Data

	Basis	F1	F2	F3	F4	F5	kontrol +	kontrol -
S.aureus	10.05	12.02	12.02	13.25	13.15	15.05	25.25	0
	10.25	12.25	12.05	13.07	14.01	15.25	23.25	0
	9.45	12.35	12.04	13.45	13.75	15.04	25.02	0
E.coli	10.25	10.35	10.35	11.45	12.04	13.35	21.06	0
	9.05	10.5	10.45	11.05	12.01	13.45	21.45	0
	9.25	10.45	10.02	10.45	12.06	13.07	21.35	0
rata-rata	9.916667	12.20667	12.03667	13.25667	13.63667	15.11333	24.50667	0
	9.516667	10.43333	10.27333	10.98333	12.03667	13.29	21.28667	0
SD	0.416333	0.169214	0.015275	0.190088	0.441059	0.118462	1.094364	0
	0.64291	0.076376	0.225019	0.503322	0.025166	0.196977	0.202567	0

**Uji
pH**

Hari ke	Basis	F1	F2	F3	F4	F5	Rata - Rata							SD
Siklus 1	5.64	5.64	5.75	5.67	5.58	5.55								0.028938
	5.68	5.62	5.64	5.62	5.62	5.60								
	5.65	5.66	5.60	5.66	5.55	5.74	5.66	5.64	5.66	5.65	5.58	5.63		
Siklus 2	5.22	5.75	5.46	5.54	5.60	5.58								0.067561
	5.55	5.65	5.40	5.58	5.53	5.55								
	5.64	5.55	5.55	5.52	5.55	5.56	5.47	5.65	5.47	5.55	5.56	5.56		
Siklus 3	5.34	5.55	5.55	5.40	5.40	5.45								0.072001
	5.30	5.50	5.46	5.45	5.55	5.55								
	5.32	5.46	5.45	5.55	5.57	5.50	5.32	5.50	5.49	5.47	5.51	5.50		
Siklus 4	5.42	5.45	5.45	5.42	5.68	5.55								0.080691
	5.45	5.40	5.41	5.45	5.65	5.40								
	5.40	5.48	5.40	5.40	5.55	5.38	5.42	5.44	5.42	5.42	5.63	5.44		
Siklus 5	5.42	5.38	5.35	5.30	5.45	5.40								0.043432
	5.35	5.40	5.27	5.35	5.40	5.42								
	5.38	5.42	5.33	5.40	5.48	5.35	5.38	5.40	5.32	5.35	5.44	5.39		
Siklus 6	5.28	5.28	5.25	5.38	5.35	5.27								0.080123
	5.20	5.32	5.28	5.55	5.32	5.30								
	5.26	5.30	5.20	5.45	5.37	5.35	5.25	5.30	5.24	5.46	5.35	5.31		

Viskositas

Hari ke	Basis	F1	F2	F3	F4	F5
	10.800	10.800	10.800	10.800	10.800	10.800
Siklus 1	10.320	9.920	10.220	11.360	11.600	11.820
	10.960	9.880	10.228	11.440	11.686	11.810
	11.280	10.200	11.360	11.480	11.808	11.880
Siklus 2	11.360	10.400	11.520	11.560	11.800	11.960
	11.120	10.320	11.280	11.600	11.840	11.840
	11.280	10.880	11.400	11.680	12.080	12.000
Siklus 3	11.440	10.800	11.550	11.636	12.160	12.080

	11.600	10.960	11.520	11.660	12.000	12.160
	11.840	11.440	11.680	11.840	12.220	12.200
Siklus 4	11.820	11.360	11.600	11.820	12.280	12.280
	11.828	11.520	11.640	11.880	12.316	12.400
	12.000	11.680	11.800	12.160	12.560	12.640
Siklus 5	12.160	11.520	11.840	12.080	12.588	12.660
	12.320	11.360	11.880	12.000	12.616	12.680
	12.220	11.840	12.000	12.240	12.840	13.200
Siklus 6	12.080	11.808	12.080	12.360	12.880	13.220
	<u>12.560</u>	<u>11.820</u>	<u>12.160</u>	<u>12.280</u>	<u>12.850</u>	<u>13.280</u>

Uji viskositas						
minggu ke-	Formula					
	Basis	F1	F2	F3	F4	F5
1	11.080	11.280	11.360	11.480	11.600	11.680
	11.160	11.200	11.380	11.400	11.580	11.660
	11.000	11.240	11.400	11.500	11.560	11.700
8	18.400	18.480	18.500	18.560	18.680	18.808
	18.440	18.500	18.550	18.600	18.720	18.820
	<u>18.420</u>	<u>18.520</u>	<u>18.528</u>	<u>18.660</u>	<u>18.760</u>	<u>18.865</u>

Lampiran 13 Data statistik

Uji pH Homogen 6 siklus

Test of Homogeneity of Variances

	Levene Statistic	df1	df2	Sig.
Basis	1.272	5	12	.337
F1	1.649	5	12	.221
F2	1.099	5	12	.410
F3	1.423	5	12	.285
F4	2.582	5	12	.083
F5	2.806	5	12	.066

Uji pH Normalitas 6 Siklus

Tests of Normality

	Hari_k e	Kolmogorov-Smirnov ^a			Shapiro-Wilk		
		Statistic	df	Sig.	Statistic	df	Sig.
Basis	Siklus 1	.292	3	.	.923	3	.463
	Siklus 2	.308	3	.	.902	3	.391
	Siklus 3	.175	3	.	1.000	3	1.000
	Siklus 4	.219	3	.	.987	3	.780
	Siklus 5	.204	3	.	.993	3	.843
	Siklus 6	.292	3	.	.923	3	.463
F1	Siklus 1	.175	3	.	1.000	3	1.000
	Siklus 2	.175	3	.	1.000	3	1.000
	Siklus 3	.196	3	.	.996	3	.878
	Siklus 4	.232	3	.	.980	3	.726
	Siklus 5	.175	3	.	1.000	3	1.000
	Siklus 6	.175	3	.	1.000	3	1.000
F2	Siklus 1	.285	3	.	.932	3	.497

F3	Siklus 2	.219	3	.	.987	3	.780
	Siklus 3	.353	3	.	.824	3	.174
	Siklus 4	.314	3	.	.893	3	.363
	Siklus 5	.292	3	.	.923	3	.463
	Siklus 6	.232	3	.	.980	3	.726
	Siklus 1	.314	3	.	.893	3	.363
F4	Siklus 2	.253	3	.	.964	3	.637
	Siklus 3	.253	3	.	.964	3	.637
	Siklus 4	.219	3	.	.987	3	.780
	Siklus 5	.175	3	.	1.000	3	1.000
	Siklus 6	.213	3	.	.990	3	.806
	Siklus 1	.204	3	.	.993	3	.843
F5	Siklus 2	.276	3	.	.942	3	.537
	Siklus 3	.346	3	.	.837	3	.206
	Siklus 4	.301	3	.	.912	3	.424
	Siklus 5	.232	3	.	.980	3	.726
	Siklus 6	.219	3	.	.987	3	.780
	Siklus 1	.286	3	.	.930	3	.490
F5	Siklus 2	.253	3	.	.964	3	.637
	Siklus 3	.175	3	.	1.000	3	1.000
	Siklus 4	.346	3	.	.837	3	.206
	Siklus 5	.276	3	.	.942	3	.537

Siklus 6	.232	3	.	.980	3	.726
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Annova Uji pH 6 siklus

ANOVA

		Sum of Squares	df	Mean Square	F	Sig.
Basis	Between Groups	.300	5	.060	6.739	.003
	Within Groups	.107	12	.009		
	Total	.406	17			
F1	Between Groups	.284	5	.057	22.921	.000
	Within Groups	.030	12	.002		
	Total	.314	17			
F2	Between Groups	.321	5	.064	20.449	.000
	Within Groups	.038	12	.003		
	Total	.359	17			
F3	Between Groups	.162	5	.032	10.858	.000
	Within Groups	.036	12	.003		
	Total	.198	17			
F4	Between Groups	.158	5	.032	10.484	.000
	Within Groups	.036	12	.003		
	Total	.194	17			
F5	Between Groups	.207	5	.041	10.346	.001
	Within Groups	.048	12	.004		
	Total	.255	17			

LSD			Multiple Comparisons				
Dependent Variable	(I) Hari_ke	(J) Hari_ke	Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval	
						Lower Bound	Upper Bound
Basis	Siklus 1	Siklus 2	.18667*	.07698	.032	.0189	.3544
		Siklus 3	.33667*	.07698	.001	.1689	.5044
		Siklus 4	.23333*	.07698	.010	.0656	.4011
		Siklus 5	.27333*	.07698	.004	.1056	.4411
		Siklus 6	.41000*	.07698	.000	.2423	.5777
		Siklus 1	-.18667*	.07698	.032	-.3544	-.0189
	Siklus 2	Siklus 3	.15000*	.07698	.075	-.0177	.3177
		Siklus 4	.04667*	.07698	.556	-.1211	.2144
		Siklus 5	.08667*	.07698	.282	-.0811	.2544
		Siklus 6	.22333*	.07698	.013	.0556	.3911
		Siklus 1	-.33667*	.07698	.001	-.5044	-.1689
		Siklus 2	-.15000*	.07698	.075	-.3177	.0177
	Siklus 3	Siklus 4	-.10333*	.07698	.204	-.2711	.0644
		Siklus 5	-.06333*	.07698	.427	-.2311	.1044
		Siklus 6	.07333*	.07698	.360	-.0944	.2411
		Siklus 1	-.23333*	.07698	.010	-.4011	-.0656
		Siklus 2	-.04667	.07698	.556	-.2144	.1211
		Siklus 3	.10333	.07698	.204	-.0644	.2711
	Siklus 4	Siklus 5	.04000	.07698	.613	-.1277	.2077
		Siklus 6	.17667*	.07698	.041	.0089	.3444
		Siklus 1	-.27333*	.07698	.004	-.4411	-.1056
		Siklus 2	-.08667	.07698	.282	-.2544	.0811
		Siklus 3	.06333	.07698	.427	-.1044	.2311
		Siklus 4	-.04000	.07698	.613	-.2077	.1277
	Siklus 5	Siklus 6	.13667	.07698	.101	-.0311	.3044
		Siklus 1	-.41000*	.07698	.000	-.5777	-.2423
		Siklus 2	-.22333*	.07698	.013	-.3911	-.0556
		Siklus 3	-.07333	.07698	.360	-.2411	.0944
		Siklus 4	-.17667*	.07698	.041	-.3444	-.0089
		Siklus 5	-.13667	.07698	.101	-.3044	.0311
F1	Siklus 1	Siklus 2	-.01000	.04064	.810	-.0986	.0786
		Siklus 3	.13667*	.04064	.006	.0481	.2252
		Siklus 4	.19667*	.04064	.000	.1081	.2852
		Siklus 5	.24000*	.04064	.000	.1514	.3286
		Siklus 6	.34000*	.04064	.000	.2514	.4286
		Siklus 1	.01000	.04064	.810	-.0786	.0986
	Siklus 2	Siklus 3	.14667*	.04064	.004	.0581	.2352
		Siklus 4	.20667*	.04064	.000	.1181	.2952
		Siklus 5	.25000*	.04064	.000	.1614	.3386
		Siklus 6	.35000*	.04064	.000	.2614	.4386
		Siklus 3	-.13667*	.04064	.006	-.2252	-.0481

F2		Siklus 2	-.14667*	.04064	.004	-.2352	-.0581
		Siklus 4	.06000	.04064	.166	-.0286	.1486
		Siklus 5	.10333*	.04064	.026	.0148	.1919
		Siklus 6	.20333*	.04064	.000	.1148	.2919
	Siklus 4	Siklus 1	-.19667*	.04064	.000	-.2852	-.1081
		Siklus 2	-.20667*	.04064	.000	-.2952	-.1181
		Siklus 3	-.06000	.04064	.166	-.1486	.0286
		Siklus 5	.04333	.04064	.307	-.0452	.1319
		Siklus 6	.14333*	.04064	.004	.0548	.2319
		Siklus 1	-.24000*	.04064	.000	-.3286	-.1514
	Siklus 5	Siklus 2	-.25000*	.04064	.000	-.3386	-.1614
		Siklus 3	-.10333*	.04064	.026	-.1919	-.0148
		Siklus 4	-.04333	.04064	.307	-.1319	.0452
		Siklus 6	.10000*	.04064	.030	.0114	.1886
		Siklus 1	-.34000*	.04064	.000	-.4286	-.2514
		Siklus 2	-.35000*	.04064	.000	-.4386	-.2614
	Siklus 6	Siklus 3	-.20333*	.04064	.000	-.2919	-.1148
		Siklus 4	-.14333*	.04064	.004	-.2319	-.0548
		Siklus 5	-.10000*	.04064	.030	-.1886	-.0114
		Siklus 2	.19333*	.04574	.001	.0937	.2930
		Siklus 3	.17667*	.04574	.002	.0770	.2763
		Siklus 4	.24333*	.04574	.000	.1437	.3430
	Siklus 1	Siklus 5	.34667*	.04574	.000	.2470	.4463
		Siklus 6	.42000*	.04574	.000	.3203	.5197
		Siklus 1	-.19333*	.04574	.001	-.2930	-.0937
		Siklus 3	-.01667	.04574	.722	-.1163	.0830
		Siklus 4	.05000	.04574	.296	-.0497	.1497
		Siklus 5	.15333*	.04574	.006	.0537	.2530
	Siklus 2	Siklus 6	.22667*	.04574	.000	.1270	.3263
		Siklus 1	-.17667*	.04574	.002	-.2763	-.0770
		Siklus 2	.01667	.04574	.722	-.0830	.1163
		Siklus 4	.06667	.04574	.171	-.0330	.1663
		Siklus 5	.17000*	.04574	.003	.0703	.2697
		Siklus 6	.24333*	.04574	.000	.1437	.3430
	Siklus 3	Siklus 1	-.24333*	.04574	.000	-.3430	-.1437
		Siklus 2	-.05000	.04574	.296	-.1497	.0497
		Siklus 3	-.06667	.04574	.171	-.1663	.0330
		Siklus 5	.10333*	.04574	.043	.0037	.2030
		Siklus 6	.17667*	.04574	.002	.0770	.2763
		Siklus 1	-.34667*	.04574	.000	-.4463	-.2470
	Siklus 4	Siklus 2	-.15333*	.04574	.006	-.2530	-.0537
		Siklus 3	-.17000*	.04574	.003	-.2697	-.0703
		Siklus 4	-.10333*	.04574	.043	-.2030	-.0037
		Siklus 6	.07333	.04574	.135	-.0263	.1730

F3	Siklus 6	Siklus 1	-.42000*	.04574	.000	-.5197	-.3203
		Siklus 2	-.22667*	.04574	.000	-.3263	-.1270
		Siklus 3	-.24333*	.04574	.000	-.3430	-.1437
		Siklus 4	-.17667*	.04574	.002	-.2763	-.0770
		Siklus 5	-.07333	.04574	.135	-.1730	.0263
		Siklus 2	.10333*	.04460	.039	.0062	.2005
	Siklus 1	Siklus 3	.18333*	.04460	.001	.0862	.2805
		Siklus 4	.22667*	.04460	.000	.1295	.3238
		Siklus 5	.30000*	.04460	.000	.2028	.3972
		Siklus 6	.19000*	.04460	.001	.0928	.2872
	Siklus 2	Siklus 1	-.10333*	.04460	.039	-.2005	-.0062
		Siklus 3	.08000	.04460	.098	-.0172	.1772
		Siklus 4	.12333*	.04460	.017	.0262	.2205
		Siklus 5	.19667*	.04460	.001	.0995	.2938
		Siklus 6	.08667	.04460	.076	-.0105	.1838
		Siklus 1	-.18333*	.04460	.001	-.2805	-.0862
	Siklus 3	Siklus 2	-.08000	.04460	.098	-.1772	.0172
		Siklus 4	.04333	.04460	.350	-.0538	.1405
		Siklus 5	.11667*	.04460	.023	.0195	.2138
		Siklus 6	.00667	.04460	.884	-.0905	.1038
	Siklus 4	Siklus 1	-.22667*	.04460	.000	-.3238	-.1295
		Siklus 2	-.12333*	.04460	.017	-.2205	-.0262
		Siklus 3	-.04333	.04460	.350	-.1405	.0538
		Siklus 5	.07333	.04460	.126	-.0238	.1705
		Siklus 6	-.03667	.04460	.427	-.1338	.0605
		Siklus 1	-.30000*	.04460	.000	-.3972	-.2028
	Siklus 5	Siklus 2	-.19667*	.04460	.001	-.2938	-.0995
		Siklus 3	-.11667*	.04460	.023	-.2138	-.0195
		Siklus 4	-.07333	.04460	.126	-.1705	.0238
		Siklus 6	-.11000*	.04460	.030	-.2072	-.0128
F4	Siklus 6	Siklus 1	-.19000*	.04460	.001	-.2872	-.0928
		Siklus 2	-.08667	.04460	.076	-.1838	.0105
		Siklus 3	-.00667	.04460	.884	-.1038	.0905
		Siklus 4	.03667	.04460	.427	-.0605	.1338
		Siklus 5	.11000*	.04460	.030	.0128	.2072
		Siklus 2	.02333	.04480	.612	-.0743	.1210
	Siklus 1	Siklus 3	.07667	.04480	.113	-.0210	.1743
		Siklus 4	-.04333	.04480	.353	-.1410	.0543
		Siklus 5	.14000*	.04480	.009	.0424	.2376
		Siklus 6	.23667*	.04480	.000	.1390	.3343
	Siklus 2	Siklus 1	-.02333	.04480	.612	-.1210	.0743
		Siklus 3	.05333	.04480	.257	-.0443	.1510
		Siklus 4	-.06667	.04480	.163	-.1643	.0310
		Siklus 5	.11667*	.04480	.023	.0190	.2143

F5	Siklus 3	Siklus 6	.21333*	.04480	.000	.1157	.3110
		Siklus 1	-.07667	.04480	.113	-.1743	.0210
		Siklus 2	-.05333	.04480	.257	-.1510	.0443
		Siklus 4	-.12000*	.04480	.020	-.2176	-.0224
		Siklus 5	.06333	.04480	.183	-.0343	.1610
		Siklus 6	.16000*	.04480	.004	.0624	.2576
	Siklus 4	Siklus 1	.04333	.04480	.353	-.0543	.1410
		Siklus 2	.06667	.04480	.163	-.0310	.1643
		Siklus 3	.12000*	.04480	.020	.0224	.2176
		Siklus 5	.18333*	.04480	.001	.0857	.2810
		Siklus 6	.28000*	.04480	.000	.1824	.3776
		Siklus 1	-.14000*	.04480	.009	-.2376	-.0424
	Siklus 5	Siklus 2	-.11667*	.04480	.023	-.2143	-.0190
		Siklus 3	-.06333	.04480	.183	-.1610	.0343
		Siklus 4	-.18333*	.04480	.001	-.2810	-.0857
		Siklus 6	.09667	.04480	.052	-.0010	.1943
		Siklus 1	-.23667*	.04480	.000	-.3343	-.1390
		Siklus 2	-.21333*	.04480	.000	-.3110	-.1157
	Siklus 6	Siklus 3	-.16000*	.04480	.004	-.2576	-.0624
		Siklus 4	-.28000*	.04480	.000	-.3776	-.1824
		Siklus 5	-.09667	.04480	.052	-.1943	.0010
		Siklus 2	.06667	.05164	.221	-.0458	.1792
		Siklus 3	.13000*	.05164	.027	.0175	.2425
		Siklus 4	.18667*	.05164	.004	.0742	.2992
	Siklus 1	Siklus 5	.24000*	.05164	.001	.1275	.3525
		Siklus 6	.32333*	.05164	.000	.2108	.4358
		Siklus 1	-.06667	.05164	.221	-.1792	.0458
		Siklus 3	.06333	.05164	.244	-.0492	.1758
		Siklus 4	.12000*	.05164	.039	.0075	.2325
		Siklus 5	.17333*	.05164	.006	.0608	.2858
	Siklus 2	Siklus 6	.25667*	.05164	.000	.1442	.3692
		Siklus 1	-.13000*	.05164	.027	-.2425	-.0175
		Siklus 2	-.06333	.05164	.244	-.1758	.0492
		Siklus 4	.05667	.05164	.294	-.0558	.1692
		Siklus 5	.11000	.05164	.055	-.0025	.2225
		Siklus 6	.19333*	.05164	.003	.0808	.3058
	Siklus 3	Siklus 1	-.18667*	.05164	.004	-.2992	-.0742
		Siklus 2	-.12000*	.05164	.039	-.2325	-.0075
		Siklus 3	-.05667	.05164	.294	-.1692	.0558
		Siklus 5	.05333	.05164	.322	-.0592	.1658

	Siklus 6	.13667*	.05164	.021	.0242	.2492
	Siklus 1	-.24000*	.05164	.001	-.3525	-.1275
	Siklus 2	-.17333*	.05164	.006	-.2858	-.0608
Siklus 5	Siklus 3	-.11000	.05164	.055	-.2225	.0025
	Siklus 4	-.05333	.05164	.322	-.1658	.0592
	Siklus 6	.08333	.05164	.133	-.0292	.1958
	Siklus 1	-.32333*	.05164	.000	-.4358	-.2108
	Siklus 2	-.25667*	.05164	.000	-.3692	-.1442
Siklus 6	Siklus 3	-.19333*	.05164	.003	-.3058	-.0808
	Siklus 4	-.13667*	.05164	.021	-.2492	-.0242
	Siklus 5	-.08333	.05164	.133	-.1958	.0292

Homogenitas Uji Viskositas freeze-thaw

Test of Homogeneity of Variances

	Levene Statistic	df1	df2	Sig.
Basis	2.391	5	12	.100
F1	1.132	5	12	.395
F2	1.779	5	12	.192
F3	.775	5	12	.586
F4	1.231	5	12	.354
F5	1.906	5	12	.167

Normalitas Uji Viskositas freeze-thaw

Tests of Normality

	Hari_k e	Kolmogorov-Smirnov ^a			Shapiro-Wilk		
		Statistic	df	Sig.	Statistic	df	Sig.
Basis	siklus1	.292	3	.	.923	3	.463
	siklus2	.253	3	.	.964	3	.637
	siklus3	.175	3	.	1.000	3	1.000
	siklus4	.219	3	.	.987	3	.780
	siklus5	.175	3	.	1.000	3	1.000
	siklus6	.273	3	.	.945	3	.549
F1	siklus1	.359	3	.	.810	3	.138
	siklus2	.219	3	.	.987	3	.780
	siklus3	.175	3	.	1.000	3	1.000
	siklus4	.175	3	.	1.000	3	1.000
	siklus5	.349	3	.	.832	3	.194
	siklus6	.232	3	.	.980	3	.726
F2	siklus1	.359	3	.	.810	3	.138

	siklus2	.253	3	.	.964	3	.637
	siklus3	.314	3	.	.893	3	.363
	siklus4	.175	3	.	1.000	3	1.000
	siklus5	.175	3	.	1.000	3	1.000
	siklus6	.175	3	.	1.000	3	1.000
	siklus1	.175	3	.	1.000	3	1.000
F3	siklus2	.253	3	.	.964	3	.637
	siklus3	.191	3	.	.997	3	.900
	siklus4	.253	3	.	.964	3	.637
	siklus5	.175	3	.	1.000	3	1.000
	siklus6	.253	3	.	.964	3	.637
	siklus1	.363	3	.	.802	3	.119
F4	siklus2	.314	3	.	.893	3	.363
	siklus3	.175	3	.	1.000	3	1.000
	siklus4	.232	3	.	.980	3	.726
	siklus5	.175	3	.	1.000	3	1.000
	siklus6	.292	3	.	.923	3	.463
	siklus1	.328	3	.	.871	3	.298
F5	siklus2	.253	3	.	.964	3	.637
	siklus3	.175	3	.	1.000	3	1.000
	siklus4	.219	3	.	.987	3	.780
	siklus5	.175	3	.	1.000	3	1.000
	siklus6	.292	3	.	.923	3	.463
	siklus1	.328	3	.	.871	3	.298

Annova Uji Viskositas freeze-thaw

ANOVA

		Sum of Squares	df	Mean Square	F	Sig.
Basis	Between Groups	5166831.111	5	1033366.222	28.324	.000
	Within Groups	437802.667	12	36483.556		
	Total	5604633.778	17			
F1	Between Groups	6683424.000	5	1336684.800	222.682	.000
	Within Groups	72032.000	12	6002.667		
	Total	6755456.000	17			
F2	Between Groups	6003067.778	5	1200613.556	220.152	.000
	Within Groups	65442.667	12	5453.556		
	Total	6068510.444	17			

F3	Between Groups	1805017.778	5	361003.556	99.884	.000
	Within Groups	43370.667	12	3614.222		
	Total	1848388.444	17			
F4	Between Groups	3134058.667	5	626811.733	295.604	.000
	Within Groups	25445.333	12	2120.444		
	Total	3159504.000	17			
F5	Between Groups	4341174.444	5	868234.889	232.135	.000
	Within Groups	44882.667	12	3740.222		
	Total	4386057.111	17			

Uji Antibakteri

Test of Homogeneity of Variances

	Levene Statistic	df1	df2	Sig.
Basis	1.143	1	4	.345
F1	2.155	1	4	.216
F2	4.734	1	4	.095
F3	2.057	1	4	.225
F4	7.667	1	4	.050
F5	1.141	1	4	.346

Tests of Normality

	Bakteri	Kolmogorov-Smirnov ^a			Shapiro-Wilk		
		Statistic	df	Sig.	Statistic	df	Sig.
Basis	s.aureus	.292	3	.	.923	3	.463
	e.coli	.328	3	.	.871	3	.298
F1	s.aureus	.268	3	.	.951	3	.573
	e.coli	.253	3	.	.964	3	.637
F2	s.aureus	.253	3	.	.964	3	.637
	e.coli	.300	3	.	.913	3	.428

F3	s.aureu	.181	3	.	.999	3	.942
	s						
	e.coli	.219	3	.	.987	3	.780
F4	s.aureu	.268	3	.	.950	3	.571
	s						
	e.coli	.219	3	.	.987	3	.780
F5	s.aureu	.370	3	.	.786	3	.081
	s						
	e.coli	.286	3	.	.930	3	.490

Annova

ANOVA

		Sum of Squares	df	Mean Square	F	Sig.
Basis	Between Groups	.240	1	.240	.818	.417
	Within Groups	1.173	4	.293		
	Total	1.413	5			
F1	Between Groups	4.717	1	4.717	273.718	.000
	Within Groups	.069	4	.017		
	Total	4.786	5			
F2	Between Groups	3.856	1	3.856	1271.214	.000
	Within Groups	.012	4	.003		
	Total	3.868	5			
F3	Between Groups	7.752	1	7.752	53.561	.002
	Within Groups	.579	4	.145		
	Total	8.331	5			
F4	Between Groups	3.840	1	3.840	39.351	.003
	Within Groups	.390	4	.098		
	Total	4.230	5			
F5	Between Groups	4.987	1	4.987	188.775	.000
	Within Groups	.106	4	.026		
	Total	5.092	5			

Uji pH suhu ruang

Test of Homogeneity of Variances

	Levene Statistic	df1	df2	Sig.
Basis	2.118	1	4	.219
F1	.800	1	4	.422
F2	.155	1	4	.714
F3	1.923	1	4	.238
F4	.800	1	4	.422
F5	.984	1	4	.377

ANOVA

		Sum of Squares	df	Mean Square	F	Sig.
Basis	Between Groups	80813400.00 0	1	80813400.00 0	23768.647	.000
	Within Groups	13600.000	4	3400.000		
	Total	80827000.00 0	5			
F1	Between Groups	79061400.00 0	1	79061400.00 0	79061.400	.000
	Within Groups	4000.000	4	1000.000		
	Total	79065400.00 0	5			
F2	Between Groups	76597974.00 0	1	76597974.00 0	149023.296	.000
	Within Groups	2056.000	4	514.000		
	Total	76600030.00 0	5			
F3	Between Groups	78337066.66 7	1	78337066.66 7	53411.636	.000
	Within Groups	5866.667	4	1466.667		
	Total	78342933.33 3	5			
F4	Between Groups	76469400.00 0	1	76469400.00 0	76469.400	.000
	Within Groups	4000.000	4	1000.000		
	Total	76473400.00 0	5			
F5	Between Groups	76705201.50 0	1	76705201.50 0	117736.303	.000
	Within Groups	2606.000	4	651.500		
	Total	76707807.50 0	5			

Uji viskositas minggu ke 1 dan ke 8

Test of Homogeneity of Variances

	Levene Statistic	df1	df2	Sig.
Basis	2.118	1	4	.219
F1	.800	1	4	.422
F2	.155	1	4	.714
F3	1.923	1	4	.238
F4	.800	1	4	.422
F5	.984	1	4	.377

Tests of Normality

	Minggu_k e	Kolmogorov-Smirnov ^a			Shapiro-Wilk		
		Statistic	df	Sig.	Statistic	df	Sig.
Basis	Minggu_k e1	.175	3	.	1.000	3	1.000
	Minggu_k e8	.175	3	.	1.000	3	1.000
F1	Minggu_k e1	.175	3	.	1.000	3	1.000
	Minggu_k e8	.175	3	.	1.000	3	1.000
F2	Minggu_k e1	.175	3	.	1.000	3	1.000
	Minggu_k e8	.198	3	.	.995	3	.868
F3	Minggu_k e1	.175	3	.	1.000	3	1.000
	Minggu_k e8	.219	3	.	.987	3	.780
F4	Minggu_k e1	.175	3	.	1.000	3	1.000
	Minggu_k e8	.175	3	.	1.000	3	1.000
F5	Minggu_k e1	.175	3	.	1.000	3	1.000
	Minggu_k e8	.310	3	.	.900	3	.384

ANOVA

	Sum of Squares	df	Mean Square	F	Sig.
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Basis	Between Groups	80813400.00	1	80813400.00	23768.647	.000
	Within Groups	13600.000	4	3400.000		
	Total	80827000.00	5			
F1	Between Groups	79061400.00	1	79061400.00	79061.400	.000
	Within Groups	4000.000	4	1000.000		
	Total	79065400.00	5			
F2	Between Groups	76597974.00	1	76597974.00	149023.296	.000
	Within Groups	2056.000	4	514.000		
	Total	76600030.00	5			
F3	Between Groups	78337066.67	1	78337066.67	53411.636	.000
	Within Groups	5866.667	4	1466.667		
	Total	78342933.33	5			
F4	Between Groups	76469400.00	1	76469400.00	76469.400	.000
	Within Groups	4000.000	4	1000.000		
	Total	76473400.00	5			
F5	Between Groups	76705201.50	1	76705201.50	117736.303	.000
	Within Groups	2606.000	4	651.500		
	Total	76707807.50	5			

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