

LAMPIRAN

Lampiran 1: Format Surat Pernyataan Bebas Plagiasi

SURAT PERNYATAAN

Yang bertanda tangan di bawah ini,

Nama : Anjani Febrianti

N P M : 11181109

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

KOMBINASI MINYAK ATSIRI RIMPANG JAHE MERAH (*Zingiber officinale* var.rubrum) DAN BUNGA CENGKEH (*Syzygium aromaticum* L) DALAM SEDIAAN SPRAY GEL

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 , 02 Agustus 2022

Yang membuat pernyataan,



(Anjani Febrianti)

NPM. 11181109

Lampiran 2: Format Surat Persetujuan untuk dipublikasikan di media on line

SURAT PERNYATAAN

Yang bertanda tangan di bawah ini,

Nama : Anjani Febrianti

N P M : 11181109

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

KOMBINASI MINYAK ATSIRI RIMPANG JAHE MERAH (*Zingiber officinale* var.rubrum) DAN BUNGA CENGKEH (*Syzygium aromaticum* L) DALAM SEDIAAN SPRAY GEL

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

Bandung , 02 Agustus 2022

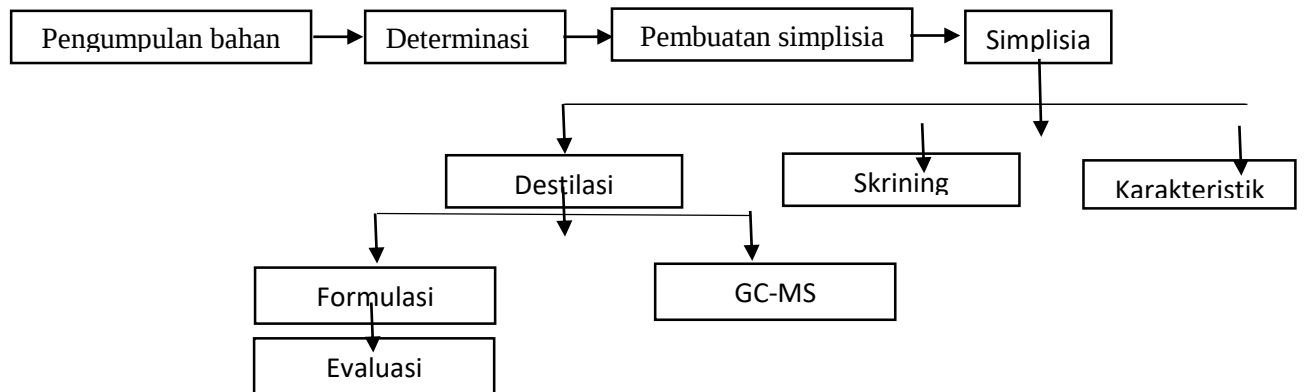
Yang membuat pernyataan,



(Anjani Febrianti)

NPM. 11181109

Lampiran 3. Skema Rancangan Kerja



Lampiran 4. Hasil Determinasi



INSTITUT TEKNOLOGI BANDUNG

SEKOLAH ILMU DAN TEKNOLOGI HAYATI

Jalan Ganesa 10 Bandung 40132, Telp.: (022) 251 1575, 250 0258, Fax.: (022) 253 4107
e-mail: sith@itb.ac.id http://www.sith.itb.ac.id

Nomor : 76/IT1.C11.2/TA.00/2022
Hal : Determinasi tumbuhan

06 Januari 2022

Kepada Yth.
Dekan
Fakultas Farmasi
Universitas Bhakti Kencana
Jalan Soekarno Hatta No. 754
Bandung

Memperhatikan surat permintaan Saudara dalam surat No. 1600/03.FF.03/UBK/XII/2021 tanggal 27 Desember 2021 mengenai determinasi tumbuhan, dengan ini kami sampaikan bahwa setelah dilakukan determinasi oleh staf kami, sampel tumbuhan yang dikirim oleh Sdr. Anjani Febrianti (NPM: 11181109), adalah :

No	Nama sampel	Hasil determinasi	Famili
1	Cengkih	<i>Syzygium aromaticum</i> (L.) Merr. & L.M.Perry	Myrtaceae
2	Jahe merah	<i>Zingiber officinale</i> var. <i>sunti</i> Val.	Zingiberaceae

Referensi:

1. Backer, C.A., & Bakhuizen van den Brink, R.C. (1963). *Flora of Java*. Vol. I. Groningen, The Netherlands: NVP Noordhoff. pp. 342.
2. Rugayah. (1994). Status Taksonomi Jahe Putih dan Jahe Merah. *Floribunda*, 1(14), 53–56.

Demikian yang kami sampaikan. Atas perhatian dan kerjasama yang diberikan, kami ucapkan terima kasih.



Wakil Dekan Bidang Sumber Daya,

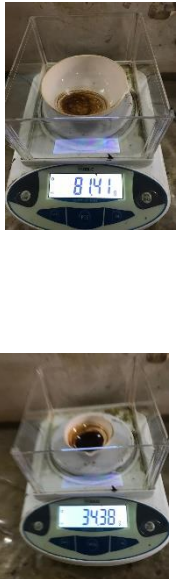
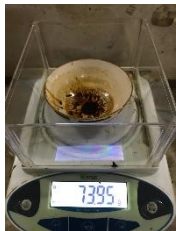
Dr. Angga Dwiartama
NIP. 198302052012121002

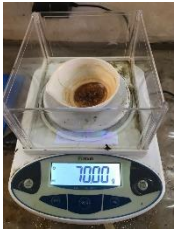
Tembusan:
Dekan SITH ITB, sebagai laporan.

Terakreditasi oleh :



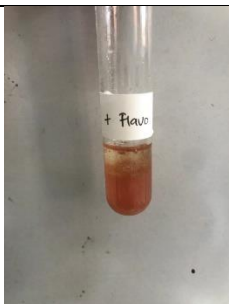
Lampiran 5. Karakterisasi Simplisia

Hasil	Gambar
Susut pengeringan 1. Jahe merah Hasil : 1,247% Memenuhi syarat karena kurang dari 10 % 1. Bunga cengkeh Hasil: 5,274% Memenuhi syarat karena kurang dari 10 %	
Penetapan kadar sari larut air 1. Jahe merah W0 = 81,19 g W1 = 81,41 g W1 = 81,41 g W1 = 81,41 g $\frac{(bobot\ cawan + sari\ air) - (bobot\ cawan\ kosong)}{5\ g} \times \frac{Volume\ Pelarut}{Volume\ Filtrat} \times 100\%$ $= \frac{0,22\ g}{5\ g} \times \frac{100}{25} \times 100\%$ $= 17,6\%$ Memenuhi syarat karena lebih dari 17% 2. Bunga cengkeh W0 = 34,06 g W1 = 34,38 g W1 = 34,38 g W1 = 34,38 g $\frac{(bobot\ cawan + sari\ air) - (bobot\ cawan\ kosong)}{5\ g} \times \frac{Volume\ Pelarut}{Volume\ Filtrat} \times 100\%$ $= \frac{0,32\ g}{5\ g} \times \frac{100}{25} \times 100\%$ $= 25,6\%$ Memenuhi syarat karena lebih dari 23%	
Penetapan kadar sari larut etanol 1. Jahe merah W0 = 73,56 g W1 = 73,95 g W1 = 73,95 g W1 = 73,95g $\frac{(bobot\ cawan + sari\ air) - (bobot\ cawan\ kosong)}{5\ g} \times \frac{Volume\ Pelarut}{Volume\ Filtrat} \times 100\%$ $= \frac{0,39\ g}{5\ g} \times 100\%$ $= 7,8\%$	

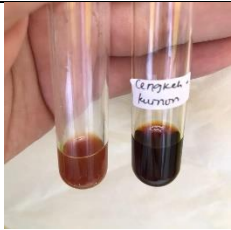
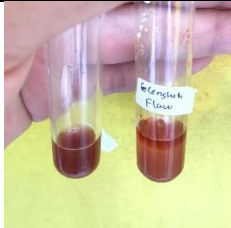
Memenuhi syarat karena lebih dari 5,8% 2. Bunga cengkeh Penetapan kadar sari larut etanol W0 = 69,63 g W1 = 70,00 g W1 = 70,00 g W1 = 70,00g $= \frac{(bobot\ cawan + sari\ air) - (bobot\ cawan\ kosong)}{5\ g} \times \frac{Volume\ Pelarut}{Volume\ Filtrat} \times 100\%$ $= \frac{69,63\ g - 70,00\ g}{5\ g} \times \frac{100}{25} \times 100\%$ $= 29,6\%$ Memenuhi syarat karena lebih dari 26%	
Penetapan kadar abu 1. Jahe merah Penetapan kadar abu total W0 = 24,53 g W1 = 24,66 g W1 = 24,66 g W1 = 24,66 g $= \frac{(bobot\ krus + bobot\ abu\ total) - (bobot\ krus\ kosong)}{3\ g} \times 100\%$ $= \frac{24,66\ g - 24,53\ g}{3\ g} \times 100\%$ $= 4,3\%$ Memenuhi syarat karena kurang dari 5,6% 2. Bunga cengkeh Penetapan kadar abu total (3 maret 2022) W0 = 26,86 g W1 = 26,96 g W1 = 26,96 g W1 = 26,96 g $= \frac{(bobot\ krus + bobot\ abu\ total) - (bobot\ krus\ kosong)}{3\ g} \times 100\%$ $= \frac{26,96\ g - 26,86\ g}{3\ g} \times 100\%$ $= 3,33\%$ Memenuhi syarat karena kurang dari 4%	 
Penetapan kadar abu tidak larut asam 1. Jahe merah W0 = 24,58 g W1 = 24,59 g W1 = 24,59 g W1 = 24,59 g $= \frac{(bobot\ krus + bobot\ abu\ total) - (bobot\ krus\ kosong)}{3\ g} \times 100\%$ $= \frac{24,61\ g - 24,59\ g}{3\ g} \times 100\%$ $= 0,33\%$ Memenuhi syarat karena tidak lebih dari 0,6% 2. Bunga cengkeh W0 = 26,87 g W1 = 26,89 g W1 = 26,89 g W1 = 26,89 g	

$= \frac{(bobot\ krus + bobot\ abu\ total) - (bobot\ krus\ kosong)}{3\ g} \times 100\%$ $= \frac{26,89\ g - 26,87\ g}{3\ g} \times 100\%$ $= 0,67\%$ Memenuhi syarat karena kurang dari 0,9%	
Penetapan kadar air 1. Jahe merah $\% \text{ Kadar air} = \frac{\text{Volume akhir} - \text{volume awal (mL)}}{\text{berat sampel (g)}} \times 100\%$ $= \frac{2,06\ \text{mL} - 2\ \text{ml}}{2\ \text{g}} \times 100\%$ $= 3\%$ 2. Bunga cengkeh $\% \text{ Kadar air} = \frac{\text{Volume akhir} - \text{volume awal (mL)}}{\text{berat sampel (g)}} \times 100\%$ $= \frac{2,1\ \text{mL} - 2\ \text{ml}}{2\ \text{g}} \times 100\%$ $= 5\%$	 

Lampiran 6. Skrining Fitokimia

Rimpang jahe merah	
Hasil	Gambar
Kuinon Hasil : Negative (-) : tidak terjadi perubahan warna	
Saponin 1. Kocok 10 detik Hasil : negatif (-) : terbentuknya busa	
Tanin 1. + gelatin (8 maret 2022) Hasil : (+)positive : terdapat kabut 2. + FecL_3 (9 maret 2022) Hasil : (+) positive : hijau violet	
Flavonoid Hasil : (+) positive : terbentuk warna kuning pada lapisan amil alkohol	
Alkaloid a. + dragendroff Hasil : (+) negative: tidak terdapat endapan warna merah bata	

b. + mayer Hasil : (-) negative : tidak terdapat endapan putih	
Steroid / triterpenoid Hasil : (+) positive steroid karena terbentuk warna hijau	

Bunga cengkeh	
Hasil	Gambar
Kuinon Hasil : Negative (+) : terjadi perubahan warna	
Saponin Kocok 10 detik Hasil : positive (-) : tidak terbentuknya busa	
Tanin 3. + gelatin (8 maret 2022) Hasil : (+)positive : terdapat kabut 4. + FecL ₃ (9 maret 2022) Hasil : (+) positive : hijau violet	
Flavonoid Hasil : (+) positive : terbentuk warna kuning pada lapisan amil alkohol	
Alkaloid c. + dragendroff Hasil : (-) negative: tidak terdapat endapan warna merah bata d. + mayer Hasil : (+) negative : terdapat endapan putih	

	
Steroid / triterpenoid Hasil : (+) positive triterpenoid karena terbentuk warna kuning	

Lampiran 7. Destilasi



Rendemen Minyak Atsiri

1. Jahe Merah

$$\% \text{Rendemen} = \frac{16 \text{ ml}}{1500 \text{ g}} \times 100\% = 1,1 \%$$

2. Bunga Cengkeh

$$\% \text{Rendemen} = \frac{43 \text{ ml}}{1000 \text{ g}} \times 100\% = 43 \%$$

1.Jahe Merah

TIC & #1

#1>#1

Peak: Scan: Group:

(x1,000,000)

Max Intensity : 1,527,542

Oven Temp

(x1,000,000)

Max Intensity : 1,527,542

Oven Temp

Time 3144 Scan# 30 Inten. 305,736 Oven Temp 51.44

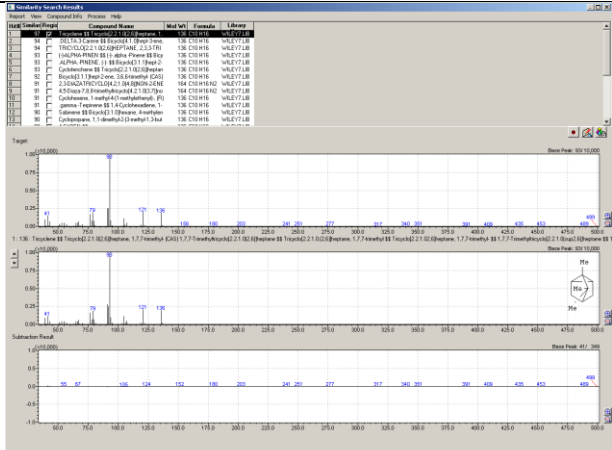
Compounds identified in the chromatogram include:

- Triclosan
- ALPHA-PINENE (D-)
- Linalene
- beta-Myrone
- S-Methyl-S-hepten-2-one
- Phthalendione
- Beta-Phellandrene
- alpha-Linalyl acetate
- beta-Caryophyllene
- alpha-Terpinolene
- Nonanone (CAS)
- Methyl heptyl ketone
- Citronella
- D-isobornyl ketone
- Z-Citral
- ENDOBORNYL ACETATE
- Undecanone (CAS)
- 2-Hexadecanone
- Citronellyl acetate
- Geranyl acetate
- Decal
- 1,4-dimethyl-4-hexeno[1,4-methy]-(CAS) ar-Curcumenol
- trans-2-penten-3-one
- gamma-Eudesmol
- gamma-Bisabolene
- gamma-Cadinene

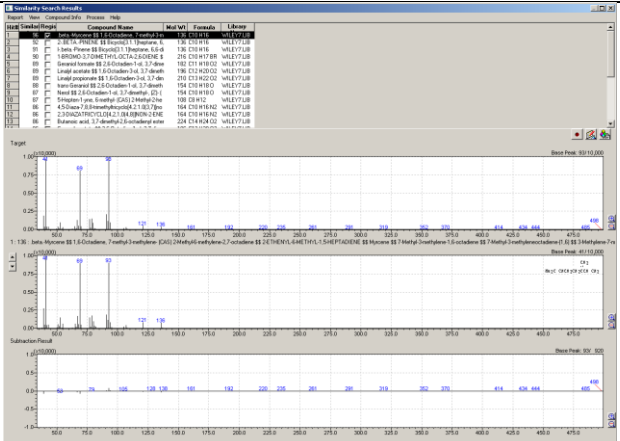
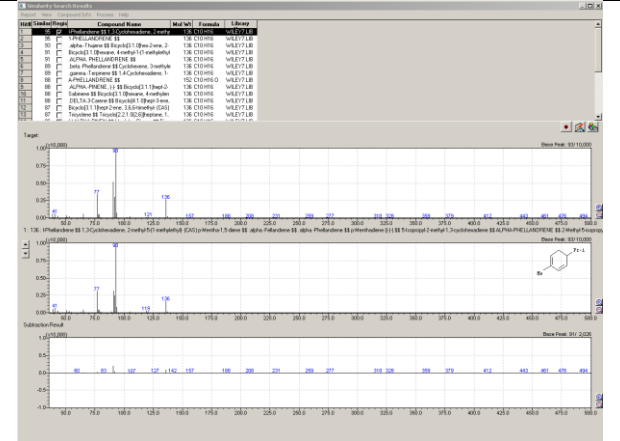
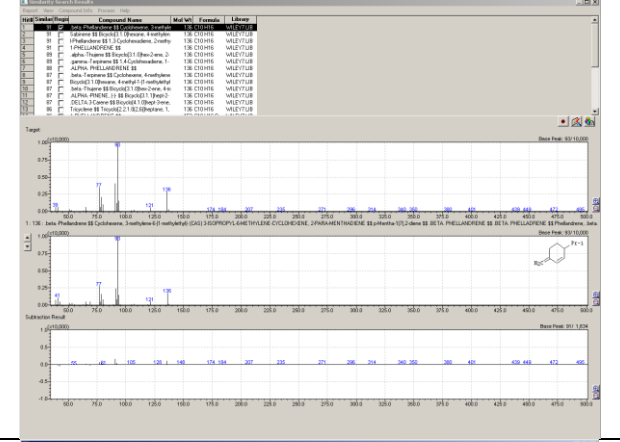
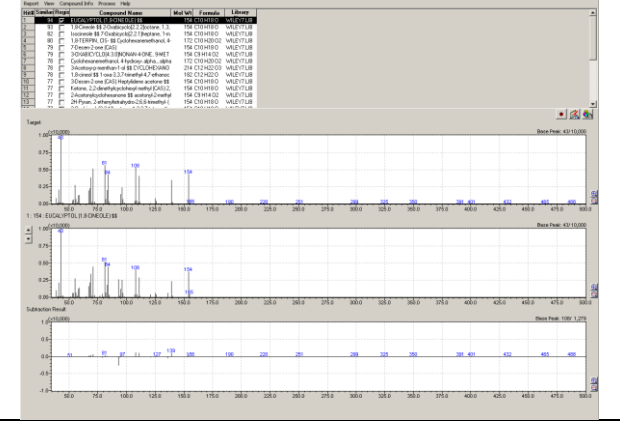
PE AK	RET TIM E	STA RT TIM E	END TIM E	M /Z	AREA	ARE A%	HEIG HT	HEIGH T%	A/ H	MA RK	NAME
1	5.733	5.700	5.770	TIC	40322	0.27	26700	0.33	1.51		Tricyclene
2	5.955	5.915	6.000	TIC	452287	2.99	301014	3.73	1.50		.ALPHA.-PINENE, (-)-
3	6.290	6.230	6.325	TIC	2461797	16.28	1512743	18.78	1.63		Camphene
4	6.818	6.750	6.850	TIC	56097	0.37	35913	0.45	1.56	V	l-.beta.-Pinene
5	6.929	6.850	6.975	TIC	245983	1.63	166292	2.06	1.48	V	6-Methyl-5-hepten-2-one
6	7.034	6.975	7.075	TIC	325764	2.15	228611	2.84	1.42	V	.beta.-Myrcene
7	7.355	7.305	7.385	TIC	88129	0.58	59056	0.73	1.49	V	l-Phellandrene
8	7.820	7.750	7.830	TIC	959748	6.35	405438	5.03	2.37		.beta.-Phellandrene
9	7.849	7.830	7.900	TIC	1045177	6.91	731004	9.07	1.43	V	EUCALYPTOL (1,8-CINEOLE)
1	8.881	8.840	8.915	TIC	74264	0.49	41932	0.52	1.77		.ALPHA.-TERPINOLENE
1	8.957	8.915	8.980	TIC	90762	0.60	48616	0.60	1.87	V	2-Nonanone (CAS) Methyl heptyl ketone
1	10.405	10.365	10.450	TIC	50921	0.34	23016	0.29	2.21		Camphor
1	10.505	10.465	10.555	TIC	63789	0.42	28324	0.35	2.25		CITRONELLA

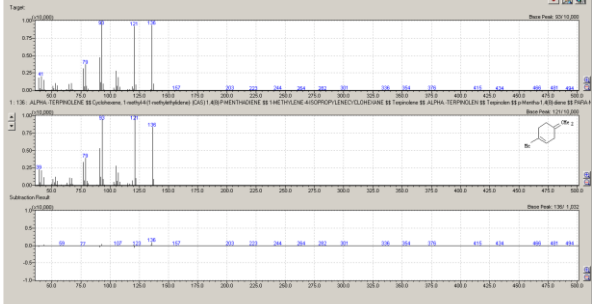
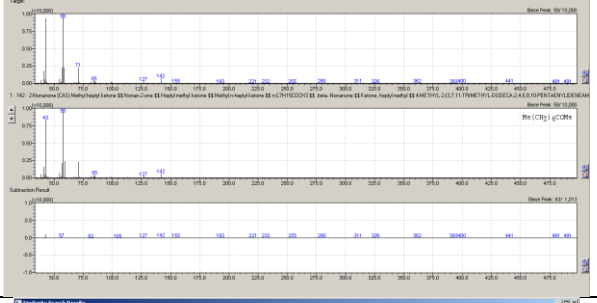
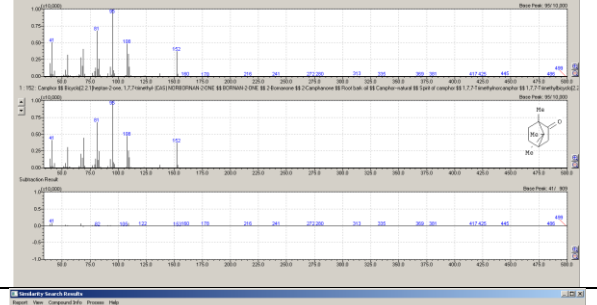
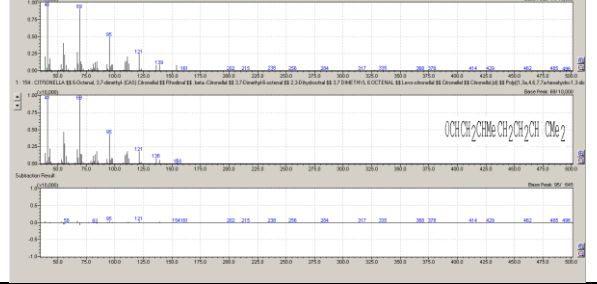
1	11.048	11.005	11.090	TIC	60635	0.40	26837	0.33	2.26		Di-norbornyl ketone
1	12.922	12.840	13.005	TIC	1777740	11.75	663381	8.23	2.68		Z-Citral
1	13.599	13.505	13.720	TIC	2680691	17.71	951057	11.80	2.82		Citral
1	13.930	13.890	13.970	TIC	123164	0.81	65438	0.81	1.88		ENDOBNORNYL ACETATE
1	14.075	13.970	14.120	TIC	100890	0.67	55458	0.69	1.82	V	2-Undecanone (CAS) 2-Hendecanone
1	15.140	15.110	15.175	TIC	63914	0.42	40539	0.50	1.58		Citronellyl acetate
2	15.648	15.595	15.695	TIC	1159434	7.67	678631	8.42	1.71		Geranyl acetate
2	17.281	17.235	17.345	TIC	789355	5.22	482369	5.98	1.64		Benzene, 1-(1,5-dimethyl-4-hexenyl)-4-methyl- (CAS) ar-Curcumene
2	17.488	17.435	17.520	TIC	1126452	7.45	682586	8.47	1.65		Zingiberene
2	17.592	17.545	17.630	TIC	336832	2.23	203830	2.53	1.65		Farnesene
2	17.669	17.630	17.730	TIC	334414	2.21	208003	2.58	1.61		.beta.-Bisabolene
2	17.895	17.855	17.925	TIC	616342	4.08	392915	4.88	1.57		.beta.-Sesquiphellandrene (CAS) 2-METHYL-6-(4-METHYLENECYCLOHEX-2-ENYL)-2-HEPTENE

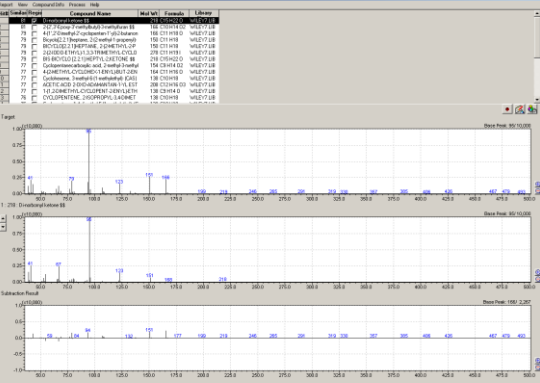
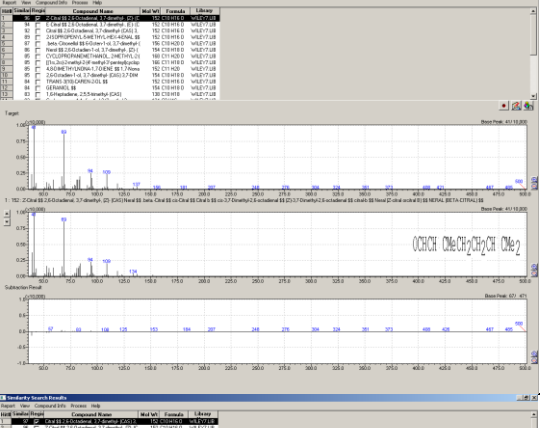
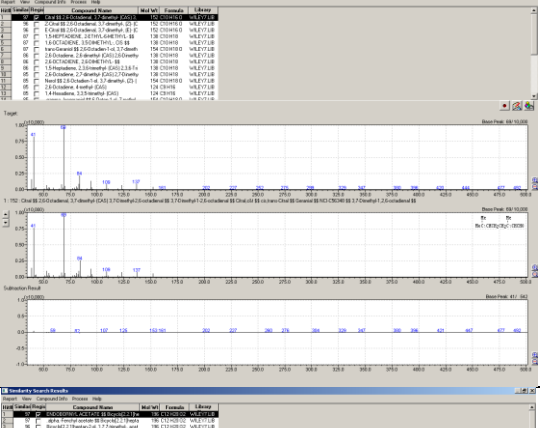
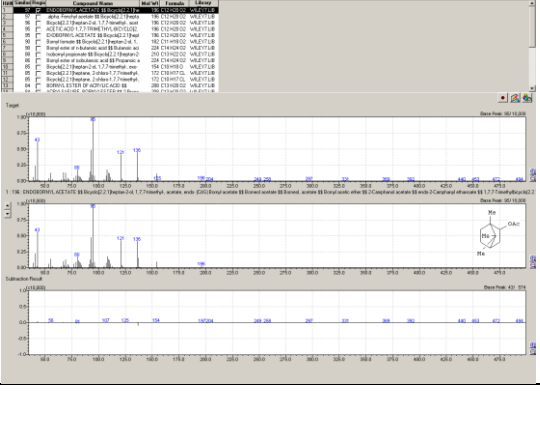
Spektrum Masa Jahe Merah

Rimpang Jahe merah		
Peak	Pola Fragmentasi Spektrum massa	
1		

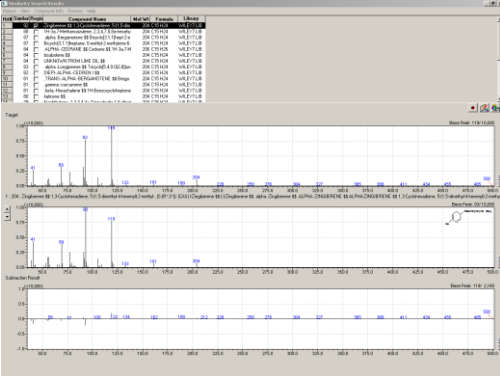
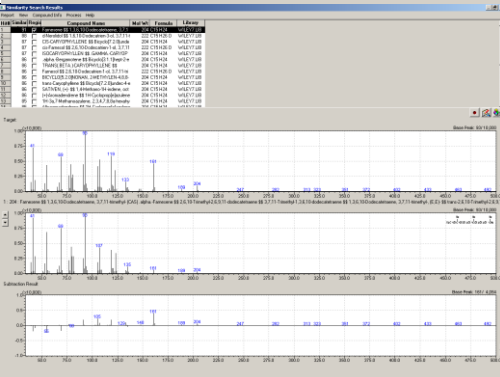
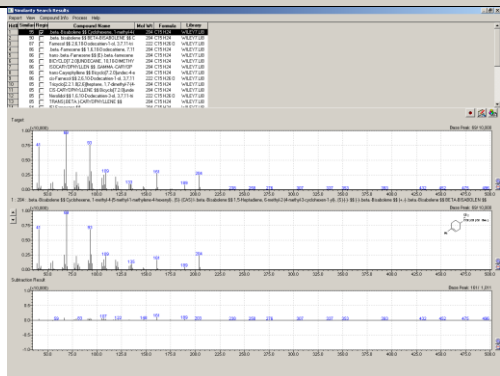
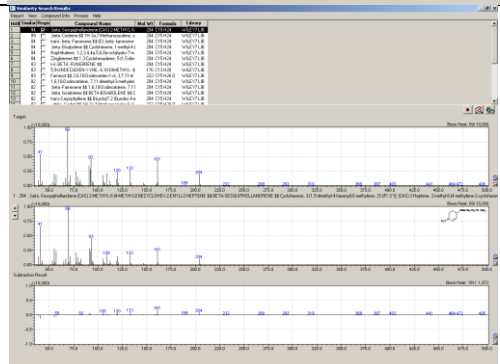
2		
3		
4		

6		
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8		
9		

10		 Target: 104.0 (100.0%) Subtraction Result: 104.0 (100.0%)
11		 Target: 104.0 (100.0%) Subtraction Result: 104.0 (100.0%)
12		 Target: 104.0 (100.0%) Subtraction Result: 104.0 (100.0%)
13		 Target: 104.0 (100.0%) Subtraction Result: 104.0 (100.0%)

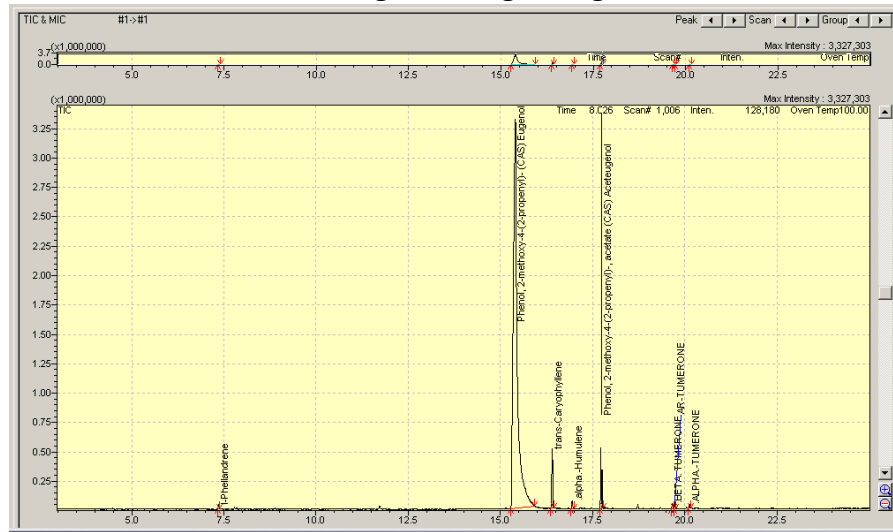
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25		

2.Bunga Cengkeh

Kromatogram Bunga Cengkeh



PEAK	RET TIME	START TIME	END TIME	M/Z	AREA	AREA %	HEIGHT	HEIGHT %	A/H	MAR K	NAME
1	7.356	7.325	7.390	TIC	55743	0.20	39216	0.81	1.42		l-Phellandrene
2	15.406	15.270	15.925	TIC	24889511	90.14	3305461	68.18	7.53	S	Phenol, 2-methoxy-4-(2-propenyl)-(CAS) Eugenol
3	16.406	16.355	16.445	TIC	881609	3.19	508290	10.48	1.73		trans-Caryophyllene
4	16.948	16.915	16.990	TIC	109447	0.40	63876	1.32	1.71		.alpha.-Humulene
5	17.745	17.685	17.785	TIC	1467632	5.32	796313	16.43	1.84		Phenol, 2-methoxy-4-(2-propenyl)-, acetate (CAS) Aceteugenol
6	19.663	19.630	19.700	TIC	67071	0.24	42944	0.89	1.56		.BETA. TUMERONE
7	19.735	19.700	19.765	TIC	95131	0.34	60336	1.24	1.58		AR-TUMERONE

8	20.130	20.100	20.160	TIC	46727	0.17	31466	0.65	1.48		.ALPHA.-TUMERONE
9	7.356	7.325	7.390	TIC	55743	0.20	39216	0.81	1.42		l-Phellandrene

Spektrum Massa Bunga Cengkeh

Peak
1

CENGKEH BUNGA

Pola Fragmentasi Spektrum massa

2

Target: 104 (Phenol, 2-methoxy-4-propenyl) [C₉H₁₀O] (MW: 150.15)

Subtraction Result: 104 (Phenol, 2-methoxy-4-propenyl) [C₉H₁₀O] (MW: 150.15)

[illegible]

Similarity Search Results

Report View Compound Info Process Web

Rank	Similarity	Compound Name	Mol Wt	Formula	Library
1	100	alpha-Humulene H 1.1.6-Coumaric-acetone	306	C ₂₁ H ₃₂ O ₄	WILEY-LIB
2	99	alpha-Humulene H 1.1.6-Coumaric-acetone	306	C ₂₁ H ₃₂ O ₄	WILEY-LIB
3	98	alpha-Humulene H 1.1.6-Coumaric-acetone	306	C ₂₁ H ₃₂ O ₄	WILEY-LIB
4	97	alpha-Humulene H 1.1.6-Coumaric-acetone	306	C ₂₁ H ₃₂ O ₄	WILEY-LIB
5	96	alpha-Humulene H 1.1.6-Coumaric-acetone	306	C ₂₁ H ₃₂ O ₄	WILEY-LIB
6	95	alpha-Humulene H 1.1.6-Coumaric-acetone	306	C ₂₁ H ₃₂ O ₄	WILEY-LIB
7	94	alpha-Humulene H 1.1.6-Coumaric-acetone	306	C ₂₁ H ₃₂ O ₄	WILEY-LIB
8	93	alpha-Humulene H 1.1.6-Coumaric-acetone	306	C ₂₁ H ₃₂ O ₄	WILEY-LIB
9	92	alpha-Humulene H 1.1.6-Coumaric-acetone	306	C ₂₁ H ₃₂ O ₄	WILEY-LIB
10	91	alpha-Humulene H 1.1.6-Coumaric-acetone	306	C ₂₁ H ₃₂ O ₄	WILEY-LIB

Target

Base Peak: 147.000

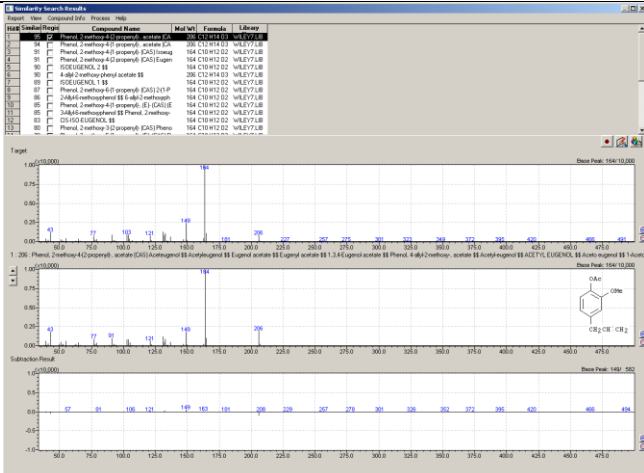
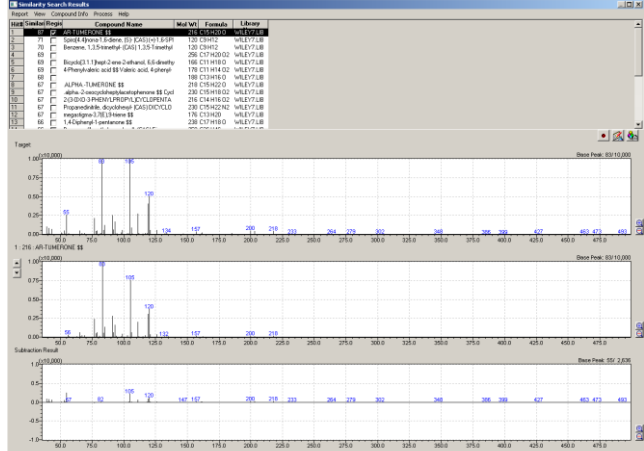
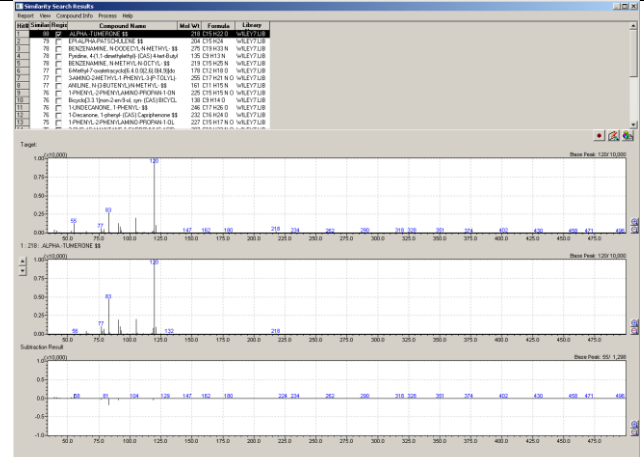
Substructure

Base Peak: 147.000

Similarity Search Results

Report View Comparison Info Protein Help

Seq#	Unlabeled/Ident	Compound Name	Mol Wt	Formula	Library
1	97	Phenol-2-methoxy-4-(propenyl) acetate B5	164	C ₁₂ H ₁₄ O ₃	WALY71.0
2	97	Phenol-2-methoxy-4-(propenyl) acetate B5	208	C ₁₄ H ₁₆ O ₃	WALY71.0
3	97	Phenol-2-methoxy-4-(propenyl) acetate B5	164	C ₁₂ H ₁₄ O ₃	WALY71.0
4	97	Phenol-2-methoxy-4-(propenyl) acetate B5	164	C ₁₂ H ₁₄ O ₃	WALY71.0
5	97	Phenol-2-methoxy-4-(propenyl) acetate B5	164	C ₁₂ H ₁₄ O ₃	WALY71.0
6	97	Phenol-2-methoxy-4-(propenyl) acetate B5	164	C ₁₂ H ₁₄ O ₃	WALY71.0
7	97	Phenol-2-methoxy-4-(propenyl) acetate B5	164	C ₁₂ H ₁₄ O ₃	WALY71.0
8	97	Phenol-2-methoxy-4-(propenyl) acetate B5	164	C ₁₂ H ₁₄ O ₃	WALY71.0
9	97	Phenol-2-methoxy-4-(propenyl) acetate B5	164	C ₁₂ H ₁₄ O ₃	WALY71.0
10	97	Phenol-2-methoxy-4-(propenyl) acetate B5	164	C ₁₂ H ₁₄ O ₃	WALY71.0
11	97	Phenol-2-methoxy-4-(propenyl) acetate B5	164	C ₁₂ H ₁₄ O ₃	WALY71.0
12	97	Phenol-2-methoxy-4-(propenyl) acetate B5	164	C ₁₂ H ₁₄ O ₃	WALY71.0
13	97	Phenol-2-methoxy-4-(propenyl) acetate B5	164	C ₁₂ H ₁₄ O ₃	WALY71.0
14	97	Phenol-2-methoxy-4-(propenyl) acetate B5	164	C ₁₂ H ₁₄ O ₃	WALY71.0
15	97	Phenol-2-methoxy-4-(propenyl) acetate B5	164	C ₁₂ H ₁₄ O ₃	WALY71.0
16	97	Phenol-2-methoxy-4-(propenyl) acetate B5	164	C ₁₂ H ₁₄ O ₃	WALY71.0
17	97	Phenol-2-methoxy-4-(propenyl) acetate B5	164	C ₁₂ H ₁₄ O ₃	WALY71.0
18	97	Phenol-2-methoxy-4-(propenyl) acetate B5	164	C ₁₂ H ₁₄ O ₃	WALY71.0
19	97	Phenol-2-methoxy-4-(propenyl) acetate B5	164	C ₁₂ H ₁₄ O ₃	WALY71.0
20	97	Phenol-2-methoxy-4-(propenyl) acetate B5	164	C ₁₂ H ₁₄ O ₃	WALY71.0
21	97	Phenol-2-methoxy-4-(propenyl) acetate B5	164	C ₁₂ H ₁₄ O ₃	WALY71.0
22	97	Phenol-2-methoxy-4-(propenyl) acetate B5	164	C ₁₂ H ₁₄ O ₃	WALY71.0
23	97	Phenol-2-methoxy-4-(propenyl) acetate B5	164	C ₁₂ H ₁₄ O ₃	WALY71.0
24	97	Phenol-2-methoxy-4-(propenyl) acetate B5	164	C ₁₂ H ₁₄ O ₃	WALY71.0
25	97	Phenol-2-methoxy-4-(propenyl) acetate B5	164	C ₁₂ H ₁₄ O ₃	WALY71.0
26	97	Phenol-2-methoxy-4-(propenyl) acetate B5	164	C ₁₂ H ₁₄ O ₃	WALY71.0
27	97	Phenol-2-methoxy-4-(propenyl) acetate B5	164	C ₁₂ H ₁₄ O ₃	WALY71.0
28	97	Phenol-2-methoxy-4-(propenyl) acetate B5	164	C ₁₂ H ₁₄ O ₃	WALY71.0
29	97	Phenol-2-methoxy-4-(propenyl) acetate B5	164	C ₁₂ H ₁₄ O ₃	WALY71.0
30	97	Phenol-2-methoxy-4-(propenyl) acetate B5	164	C ₁₂ H ₁₄ O ₃	WALY71.0
31	97	Phenol-2-methoxy-4-(propenyl) acetate B5	164	C ₁₂ H ₁₄ O ₃	WALY71.0
32	97	Phenol-2-methoxy-4-(propenyl) acetate B5	164	C ₁₂ H ₁₄ O ₃	WALY71.0
33	97	Phenol-2-methoxy-4-(propenyl) acetate B5	164	C ₁₂ H ₁₄ O ₃	WALY71.0
34	97	Phenol-2-methoxy-4-(propenyl) acetate B5	164	C ₁₂ H ₁₄ O ₃	WALY71.0
35	97	Phenol-2-methoxy-4-(propenyl) acetate B5	164	C ₁₂ H ₁₄ O ₃	WALY71.0
36	97	Phenol-2-methoxy-4-(propenyl) acetate B5	164	C ₁₂ H ₁₄ O ₃	WALY71.0
37	97	Phenol-2-methoxy-4-(propenyl) acetate B5	164	C ₁₂ H ₁₄ O ₃	WALY71.0
38	97	Phenol-2-methoxy-4-(propenyl) acetate B5	164	C ₁₂ H ₁₄ O ₃	WALY71.0
39	97	Phenol-2-methoxy-4-(propenyl) acetate B5	164	C ₁₂ H ₁₄ O ₃	WALY71.0
40	97	Phenol-2-methoxy-4-(propenyl) acetate B5	164	C ₁₂ H ₁₄ O ₃	WALY71.0
41	97	Phenol-2-methoxy-4-(propenyl) acetate B5	164	C ₁	

6		
7		
8		

Lampiran 9. Data Hasil Evaluasi
Organoleptis



Viskometer Brookfield



pH Meter



1. Viskositas

Hari	F1	F2	F3
0	1547	1413	1387
	1545	1410	1382
	1540	1411	1387
Rerata	1544	1411.333	1385.333
Sd	2.94392	1.247219	2.357023
7	1520	1373	1383
	1524	1370	1386
	1521	1373	1383
Rerata	1521.667	1372	1384
Sd	1.699673	1.414214	1.414214
14	1453	1360	1373
	1455	1364	1376
	1452	1363	1373
Rerata	1453.333	1362.333	1374
Sd	1.247219	1.699673	1.414214
21	1450	1333	1360
	1453	1330	1362
	1452	1333	1361
Rerata	1451.667	1332	1361
Sd	1360	1.414214	0.816497

Tests of Normality

	HARI KE	Kolmogorov-Smirnov ^a			Shapiro-Wilk		
		Statistic	df	Sig.	Statistic	df	Sig.
FORMULA_1	HARI KE 0	.314	3	.	.893	3	.363
	HARI KE 7	.292	3	.	.923	3	.463
	HARI KE 14	.253	3	.	.964	3	.637
	HARI KE 21	.253	3	.	.964	3	.637
FORMULA_2	HARI KE 0	.292	3	.	.923	3	.463
	HARI KE 7	.175	3	.	1.000	3	1.000
	HARI KE 14	.292	3	.	.923	3	.463
	HARI KE 21	.253	3	.	.964	3	.637
FORMULA_3	HARI KE 0	.219	3	.	.987	3	.780
	HARI KE 7	.253	3	.	.964	3	.637
	HARI KE 14	.253	3	.	.964	3	.637
	HARI KE 21	.175	3	.	1.000	3	1.000

Test of Homogeneity of Variances

	Levene Statistic	df1	df2	Sig.
FORMULA_1	.815	3	8	.521
FORMULA_2	1.128	3	8	.394
FORMULA_3	.872	3	8	.495

ANOVA

	Sum of Squares	df	Mean Square	F	Sig.
FORMULA_1 Between Groups	19806.917	3	6602.306	1650.576	.000
Within Groups	32.000	8	4.000		
Total	19838.917	11			
FORMULA_2 Between Groups	9596.417	3	3198.806	792.374	.000
Within Groups	32.296	8	4.037		
Total	9628.713	11			
FORMULA_3 Between Groups	1133.667	3	377.889	125.963	.000
Within Groups	24.000	8	3.000		
Total	1157.667	11			

2.pH

Hari	F1	F2	F3
0	5.41	5.83	5.16
	5.42	5.8	5.18
	5.4	5.8	5.16
Rerata	5.41	5.81	5.166667
Sd	0.008165	0.014142	0.009428
7	5.8	5.86	6.1
	5.79	5.88	6.11
	5.82	5.88	6.09
Rerata	5.803333	5.873333	6.1
Sd	0.012472	0.009428	0.008165
14	5.81	6.01	6.18
	5.83	6	6.16
	5.8	6.03	6.16
Rerata	5.813333	6.013333	6.166667
Sd	0.012472	0.012472	0.009428
21	5.8	6.01	6.17
	5.84	6.05	6.19
	5.81	6.04	6.16
Rerata	5.816667	6.033333	6.173333
Sd	0.016997	0.01472	0.010801

Tests of Normality

	HARI KE	Kolmogorov-Smirnov ^a			Shapiro-Wilk		
		Statistic	df	Sig.	Statistic	df	Sig.
FORMULA_1	HARI KE 0	.175	3	.	1.000	3	1.000
	HARI KE 7	.253	3	.	.964	3	.637
	HARI KE 14	.253	3	.	.964	3	.637
	HARI KE 21	.292	3	.	.923	3	.463
FORMULA_2	HARI KE 0	.253	3	.	.964	3	.637
	HARI KE 7	.175	3	.	1.000	3	1.000
	HARI KE 14	.253	3	.	.964	3	.637
	HARI KE 21	.292	3	.	.923	3	.463
FORMULA_3	HARI KE 0	.385	3	.	.750	3	.000
	HARI KE 7	.175	3	.	1.000	3	1.000
	HARI KE 14	.175	3	.	1.000	3	1.000
	HARI KE 21	.253	3	.	.964	3	.637

a. Lilliefors Significance Correction

Test of Homogeneity of Variances

	Levene Statistic	df1	df2	Sig.
FORMULA_1	.790	3	8	.533
FORMULA_2	.790	3	8	.533
FORMULA_3	.419	3	8	.744

ANOVA

		Sum of Squares	df	Mean Square	F	Sig.
FORMULA_1	Between Groups	.362	3	.121	483.056	.000
	Within Groups	.002	8	.000		
	Total	.364	11			
FORMULA_2	Between Groups	.104	3	.035	139.233	.000
	Within Groups	.002	8	.000		
	Total	.106	11			
FORMULA_3	Between Groups	2.176	3	.725	5120.216	.000
	Within Groups	.001	8	.000		
	Total	2.177	11			

Multiple Comparisons

LSD

Dependent Variable	(I)	(J)	Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval	
						Lower Bound	Upper Bound
FORMULA_1	HARI KE 0	HARI KE 7	-.39333*	.01291	.000	-.4231	-.3636
		HARI KE 14	-.40333*	.01291	.000	-.4331	-.3736
		HARI KE 21	-.40667*	.01291	.000	-.4364	-.3769
	HARI KE 7	HARI KE 0	.39333*	.01291	.000	.3636	.4231
		HARI KE 14	-.01000	.01291	.461	-.0398	.0198
		HARI KE 21	-.01333	.01291	.332	-.0431	.0164
	HARI KE 14	HARI KE 0	.40333*	.01291	.000	.3736	.4331
		HARI KE 7	.01000	.01291	.461	-.0198	.0398
		HARI KE 21	-.00333	.01291	.803	-.0331	.0264
	HARI KE 21	HARI KE 0	.40667*	.01291	.000	.3769	.4364
		HARI KE 7	.01333	.01291	.332	-.0164	.0431
		HARI KE 14	.00333	.01291	.803	-.0264	.0331
FORMULA_2	HARI KE 0	HARI KE 7	-.05667*	.01291	.002	-.0864	-.0269
		HARI KE 14	-.20000*	.01291	.000	-.2298	-.1702
		HARI KE 21	-.22000*	.01291	.000	-.2498	-.1902
	HARI KE 7	HARI KE 0	.05667*	.01291	.002	.0269	.0864
		HARI KE 14	-.14333*	.01291	.000	-.1731	-.1136
		HARI KE 21	-.16333*	.01291	.000	-.1931	-.1336
	HARI KE 14	HARI KE 0	.20000*	.01291	.000	.1702	.2298
		HARI KE 7	.14333*	.01291	.000	.1136	.1731
		HARI KE 21	-.02000	.01291	.160	-.0498	.0098
	HARI KE 21	HARI KE 0	.22000*	.01291	.000	.1902	.2498
		HARI KE 7	.16333*	.01291	.000	.1336	.1931
		HARI KE 14	.02000	.01291	.160	-.0098	.0498
FORMULA_3	HARI KE 0	HARI KE 7	-.93333*	.00972	.000	-.9557	-.9109

	HARI KE 14	-1.00333*	.00972	.000	-1.0257	-.9809
	HARI KE 21	-1.00667*	.00972	.000	-1.0291	-.9843
HARI KE 7	HARI KE 0	.93333*	.00972	.000	.9109	.9557
	HARI KE 14	-.07000*	.00972	.000	-.0924	-.0476
	HARI KE 21	-.07333*	.00972	.000	-.0957	-.0509
HARI KE 14	HARI KE 0	1.00333*	.00972	.000	.9809	1.0257
	HARI KE 7	.07000*	.00972	.000	.0476	.0924
	HARI KE 21	-.00333	.00972	.740	-.0257	.0191
HARI KE 21	HARI KE 0	1.00667*	.00972	.000	.9843	1.0291
	HARI KE 7	.07333*	.00972	.000	.0509	.0957
	HARI KE 14	.00333	.00972	.740	-.0191	.0257

*. The mean difference is significant at the 0.05 level.

3. daya sebar

Hari	F1	F2	F3
0	5.4	5.7	5.9
	5.3	5.7	5.8
	5.4	5.9	5.8
Rerata	5.366667	5.766667	5.833333
Sd	0.04714	0.094281	0.04714
7	5.4	5.8	5.8
	5.5	5.9	5.9
	5.5	5.8	5.7
Rerata	5.466667	5.833333	5.8
Sd	0.04714	0.04714	0.08165
14	5.8	6	6
	6	6.2	6.3
	6.1	6.2	6.2
Rerata	5.966667	6.133333	6.166667
Sd	0.124722	0.094281	0.124722
21	6	6.6	6.7
	6.3	6.7	6.7
	6.2	6.7	6.8
Rerata	6.166667	6.666667	6.733333
Sd	0.124722	0.04714	0.04714

Tests of Normality

	HARI KE	Kolmogorov-Smirnov ^a			Shapiro-Wilk		
		Statistic	df	Sig.	Statistic	df	Sig.
FORMULA_1	HARI KE 0	.175	3	.	1.000	3	1.000
	HARI KE 7	.175	3	.	1.000	3	1.000
	HARI KE 14	.253	3	.	.964	3	.637
	HARI KE 21	.253	3	.	.964	3	.637
FORMULA_2	HARI KE 0	.253	3	.	.964	3	.637
	HARI KE 7	.175	3	.	1.000	3	1.000
	HARI KE 14	.175	3	.	1.000	3	1.000
	HARI KE 21	.175	3	.	1.000	3	1.000
FORMULA_3	HARI KE 0	.175	3	.	1.000	3	1.000
	HARI KE 7	.175	3	.	1.000	3	1.000
	HARI KE 14	.253	3	.	.964	3	.637
	HARI KE 21	.175	3	.	1.000	3	1.000

a. Lilliefors Significance Correction

Test of Homogeneity of Variances

	Levene Statistic	df1	df2	Sig.
FORMULA_1	.485	3	8	.702
FORMULA_2	.400	3	8	.757
FORMULA_3	.400	3	8	.757

ANOVA

		Sum of Squares	df	Mean Square	F	Sig.
FORMULA_1	Between Groups	1.216	3	.405	24.317	.000
	Within Groups	.133	8	.017		
	Total	1.349	11			
FORMULA_2	Between Groups	1.402	3	.467	35.062	.000
	Within Groups	.107	8	.013		
	Total	1.509	11			
FORMULA_3	Between Groups	1.630	3	.543	40.750	.000
	Within Groups	.107	8	.013		
	Total	1.737	11			

Lsd

Dependent Variable	(I)	(J)	Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval	
						Lower Bound	Upper Bound
FORMULA_1	HARI KE 0	HARI KE 7	-.1000	.1054	.371	-.343	.143
		HARI KE 14	-.5667*	.1054	.001	-.810	-.324
		HARI KE 21	-.7667*	.1054	.000	-1.010	-.524
	HARI KE 7	HARI KE 0	.1000	.1054	.371	-.143	.343
		HARI KE 14	-.4667*	.1054	.002	-.710	-.224
		HARI KE 21	-.6667*	.1054	.000	-.910	-.424
	HARI KE 14	HARI KE 0	.5667*	.1054	.001	.324	.810
		HARI KE 7	.4667*	.1054	.002	.224	.710
		HARI KE 21	-.2000	.1054	.094	-.443	.043
	HARI KE 21	HARI KE 0	.7667*	.1054	.000	.524	1.010
		HARI KE 7	.6667*	.1054	.000	.424	.910
		HARI KE 14	.2000	.1054	.094	-.043	.443
FORMULA_2	HARI KE 0	HARI KE 7	-.0667	.0943	.500	-.284	.151
		HARI KE 14	-.3667*	.0943	.005	-.584	-.149
		HARI KE 21	-.8667*	.0943	.000	-1.084	-.649
	HARI KE 7	HARI KE 0	.0667	.0943	.500	-.151	.284
		HARI KE 14	-.3000*	.0943	.013	-.517	-.083
		HARI KE 21	-.8000*	.0943	.000	-1.017	-.583
	HARI KE 14	HARI KE 0	.3667*	.0943	.005	.149	.584

		HARI KE 7	.3000*	.0943	.013	.083	.517
		HARI KE 21	-.5000*	.0943	.001	-.717	-.283
	HARI KE 21	HARI KE 0	.8667*	.0943	.000	.649	1.084
		HARI KE 7	.8000*	.0943	.000	.583	1.017
		HARI KE 14	.5000*	.0943	.001	.283	.717
FORMULA_3	HARI KE 0	HARI KE 7	.0000	.0943	1.000	-.217	.217
		HARI KE 14	-.3667*	.0943	.005	-.584	-.149
		HARI KE 21	-.9000*	.0943	.000	-1.117	-.683
	HARI KE 7	HARI KE 0	.0000	.0943	1.000	-.217	.217
		HARI KE 14	-.3667*	.0943	.005	-.584	-.149
		HARI KE 21	-.9000*	.0943	.000	-1.117	-.683
	HARI KE 14	HARI KE 0	.3667*	.0943	.005	.149	.584
		HARI KE 7	.3667*	.0943	.005	.149	.584
		HARI KE 21	-.5333*	.0943	.000	-.751	-.316
	HARI KE 21	HARI KE 0	.9000*	.0943	.000	.683	1.117
		HARI KE 7	.9000*	.0943	.000	.683	1.117
		HARI KE 14	.5333*	.0943	.000	.316	.751

Lampiran 10. CoA Carbomer 940



PT. SUMBER INOVASI LESTARINDO

PERGUDANGAN ERA PRIMA, JL. Daan Mogot Km. 21 Blok B-9

Batu Ceper, Kec. Batuceper, Kota Tangerang, Banten 15122

CERTIFICATE OF ANALYSIS

Product Name : Carbomer 940
Lot Number : 11021041
Production Date : August 2021
Expired Date : Juli 2024

Anaysis Data	Units	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
Identification		10 mg/mL Dispersion with Thymol Blue - Orange Color	Orange color produced
Identification		10 mg/mL Dispersion with Cresol Red - YellowColor	Yellow color produced
Viscosity (0,5% Aqueous Dispersion)	mPa.s	40000 to 60000	48000
Loss on drying (In a vacuum at 80°C for 1 hour)	%	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

Analysis Method : The Product Conforms To the Standard

This certificate of analysis is processed automatically and valid without signature

Lampiran 11. CoA DMDM Hydantoin

COA

DMDM Hydantoin

生产批号 Batch No.	20200511	批号数量 Quantity	4000kg
生产日期 Date of Pro.	2020/05/11	有效期 Date of Exp.	2023/05/10
项 目 Item	质量指标 Specification	分析结果 Test Results	
外 观 Appearance	无色透明液体 Colorless transparent Liquid	无色透明液体 Pass	
气味 Odor	特征气味 Characteristic scent	特征气味 Pass	
色度 Color (APHA)	≤ 10	4	
PH 值 (25℃) PH Value (25℃)	6.5-8.0	7.5	
活性物含量 DMDM Hydantoin	53.0-56.0	55.6%	
总醛含量 Total Formaldehyde %	17.0-19.0	17.8	
水份 Water %	42-46	44.7	
游离醛含量 Free formaldehyde ≤%	1	0.97	
含氮量 Nitrogen Content %	8.04-8.34	8.12	

ANCHEMIE
DEKAT CEMERLANG

Reported by: 刘双/Liu Shuang Approved by: 黄丽坚/Huang Lijian

Lampiran 12. CoA Propilenglikol

 DOW CHEMICAL PACIFIC (SINGAPORE) PRIVATE LIMITED					
Certificate of Analysis					
Product Number	00000114877				
Product Name	Propylene Glycol USP/EP				
Delivery No.	815887831 / 000010				
Order Number	109782356				
Shipping Units	80.000 DR				
Date Shipped	2021-01-25 (YYYY-MM-DD)				
Shipment No.	34610717				
Batch Number	C815KCN41				
Expiration Date	2022-12-23 (YYYY-MM-DD)				
Manufacturing Date	2020-12-23 (YYYY-MM-DD)				
Quantity	80.000 DR				
Net Weight	17200.000 KG				
Manufacturing Plant	MTP AIE PG				
Manufacturer Address	10/4 Moo2 ASIA INDEEST BANCHANG Rayong 21130				
It is hereby certified that the material indicated above has been inspected and tested in accordance with the conditions and requirements of the contract or purchase order and, unless agreed otherwise conforms in all respects to the specification relevant thereto and it meets all requirements of the current United States Pharmacopoeia, current Food Chemical Codex, current European Pharmacopoeia and current Pharmacopoeia of Japan.					
Test	Unit	Lower Limit	Upper Limit	Value	Method
Assay	%	99.80	-	99.95	Current USP
M Acidity	ml	-	0.20	0.03	Current USP
M Chlorides	ppm	-	70	< 70	Current USP
M Heavy Metals	ppm	-	5.0	< 5.0	Current USP
M Residue on Ignition per 50g	mg	-	3.50	0.23	Current USP
M Specific Gravity @ 25/25degC		1.035	1.037	1.036	Current USP
M Sulfate	ppm	-	60	< 60	Current USP
Water Content	%	-	0.200	0.022	Current USP
M ID Test A matches IR scan	-	-	-	Pass	Current USP
ID Test B Limit of Ethylene Glycol	-	-	-	Pass	Current USP

Lampiran 13. CoA Trietanolamin



Date : 12/28/2020

Bachtobelstraße 3
8810 Horgen
Switzerland

TRIETHANOLAMINE-99%
[CAS 102-71-6]

Certificate of Analysis

Lot No : 0887-2020
Quantity : 1900 kgs

Manf. Date : 10.2020
Expiry Date : 10.2024

Property	Result of test	Test Method*
Appearance, 30°C	Clear and substantially free of foreign matter	ST-30.1
Color, Pt-Co	40	ST-30.12
Composition, wt%		ST-35.99
Triethanolamine	99.0	
Diethanolamine	0.099	
Monoethanolamine	0.1	
Equivalent weight	148	ST-5.5
Iron, ppm	10	ST-37.1
Specific gravity, 20/20°C	1.1240	ST-30.31
Water, wt%	0.2	ST-31.53, 5
Boiling point, 760 mm Hg, °C	360	ST-50
Flash point, PMCC, °F	395	ST-51.1
Melting point, °C	21	ST-51.2
pH	11	ST-55.3
Vapor pressure, 20°C, mm Hg	<0.01	ST-55.4
Viscosity, cSt, 25°C	527	ST-55.5
Weight, 20°C, lb/gal	9.38	

Approve according to USP specification
This document not need a signature due to electronic file

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