BAB V

KESIMPULAN DAN SARAN

A. Kesimpulan

Pertama, komponen minyak, surfaktan, dan kosurfaktan yang terpilih yaitu Capryol, Kolliphor, dan PEG 400 dengan rasio minyak : Smix 4 : 6 dan rasio surfaktan : kosurfaktan 2 : 1.

Kedua, perubahan muatan *gelling agent* dan viskositas mempengaruhi profil difusi dan aktivitas antioksidan nano-emulgel resveratrol. Muatan *gelling agent* memberi pengaruh yaitu meningkatkan difusi dan aktivitas antioksidan nano-emulgel resveratrol. Viskositas memberi pengaruh menurunkan profil difusi.

Ketiga, muatan *gelling agent* kationik dan viskositas 100 dPas menunjukkan formula yang paling bagus dalam transpor melewati membran *shed snake skin*.

B. Saran

Pertama, perlu dilakukan penelitian selanjutnya untuk uji in vivo dan *transport modelling* untuk mengetahui kinetika transport secara perkutan.

Kedua, perlu dilakukan studi kadar resveratrol yang tertransport secara farmakokinetik.

Ketiga, perlu dilakukan pengembangan formula berbasis optimasi dari kombinasi muatan *gelling agent* kationik dengan viskositas 100 dPas.

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LAMPIRAN

Lampiran 1. COA resveratrol

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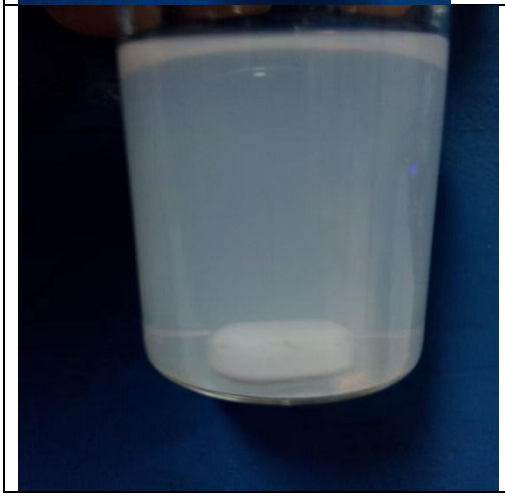
CERTIFICATE OF ANALYSIS

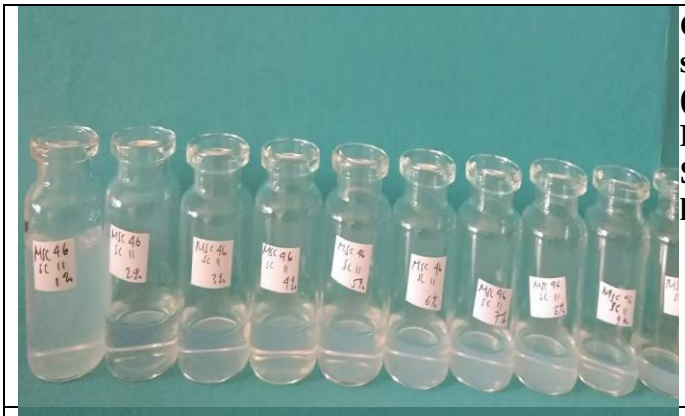
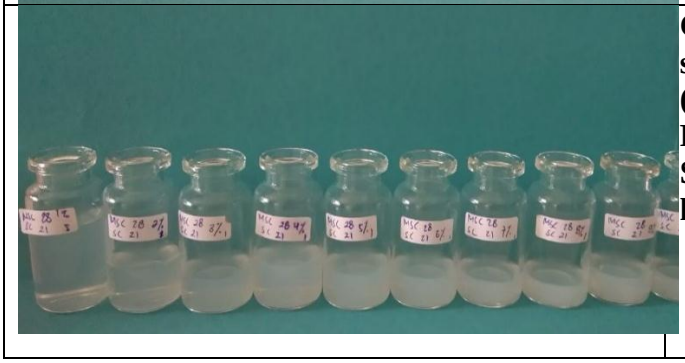
Product Name	Resveratrol	**Code**	BPBE-629-A
Botanical Source	Polygonum cuspidatum Sieb.Et Zucc	**Used Part**	Root
Batch No.	H020862918A	**Mfg. Date**	Aug. 10, 2018
Packing	25kg/Drum	**Retest Date**	Aug. 09, 2020
Quantity	10g	**Report Date**	Aug. 17, 2018
Specification	98%(HPLC)		

ITEM	SPECIFICATION	RESULT
Assay(HPLC)	≥98.0%	98.26%
Appearance	Milky - white powder	Complies
Odor	Characteristic	Complies
Taste	Characteristic	Complies
Particle Size	NLT 95% pass 80 mesh	Complies
Loss on Drying	≤0.5%	0.20%
Ash	≤0.5%	0.07%
Bulk Density	35-45g/100mL	40g/100mL
Heavy Metals -As -Pb -Cd -Hg	≤10ppm ≤1.0ppm ≤1.5ppm ≤0.5ppm ≤0.1ppm	Complies Complies Complies Complies Complies
Total Plate Count -Yeast & Mold -E.Coli -Salmonella	≤1000cfu/g ≤100cfu/g Negative Negative	Complies Complies Negative Negative
Conclusion	Comply with the specification.	
Storage	Preserve in tight containers, protected from strong light and high heat. Store in dry cool place.	

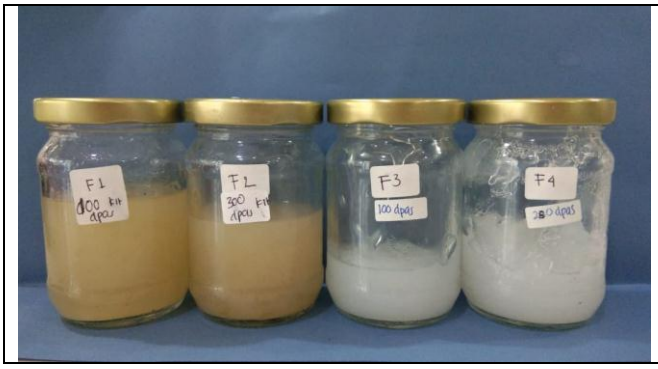
Analyst: QC Manager: QA:

Lampiran 2. Gambar hasil penelitian

	**Gambar Minyak, surfaktan, kosurfaktan (Capryol, Labrafil, PEG 400)**
	**Gambar Minyak, surfaktan, kosurfaktan (Capryol, Labrasol, PEG 400)**
	**Gambar Minyak, surfaktan, kosurfaktan (Labrafac Lipofil, Labrafil, PEG 400)**

	**Gambar Minyak, surfaktan, kosurfaktan (Capryol, Khollipor, PEG 400) minyak : Smix 4:6 surfaktan : kosurfaktan 1:1**
	**Gambar Minyak, surfaktan, kosurfaktan (Capryol, Khollipor, PEG 400) minyak : Smix 4:6 surfaktan : kosurfaktan 2:1**
	**Gambar Minyak, surfaktan, kosurfaktan (Capryol, Khollipor, PEG 400) minyak : Smix 2:8 surfaktan : kosurfaktan 2:1**

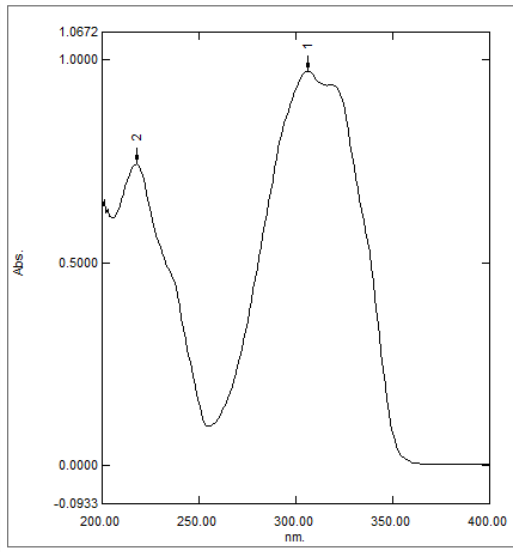
	**Gambar Uji *drug loading***
	**Gambar Sampel uji difusi Franz**
	**Gambar Nanoemulgel resveratrol sebelum uji Freeze Thaw**

	**Gambar Nanoemulgel resveratrol sesudah uji Freeze Thaw**

Lampiran 3. Hasil penentuan panjang gelombang maksimum

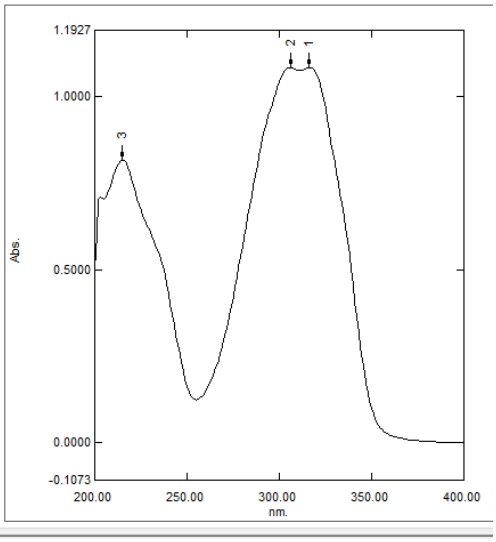
A. Resveratrol dalam media metanol

No.	P/V	Wavelength nm.	Abs.	Description
1	↑	306.00	0.9705	
2	↑	218.00	0.7423	
3	↓	255.00	0.0972	



B. Resveratrol dalam media PBS *p*H 7,4

No.	P/V	Wavelength nm.	Abs.	Description
1	↑	316.00	1.0838	
2	↑	306.00	1.0844	
3	↑	215.00	0.8176	
4	↓	312.00	1.0769	
5	↓	255.00	0.1247	



Lampiran 4. Kurva kalibrasi dan validasi metode analisis

A. Kurva kalibrasi resveratrol dalam metanol

Perhitungan larutan induk

Berat penimbangan = 52,6 mg

$52{,}6\ {mg}/{10\ mL} = {5260\ mg}/{1000\ mL}$ = 5260 µg/mL

Pembuatan larutan stok 105,02 µg/mL

$V_1 \times C_1 = V_2 \times C_2$

V_1 x 5260 µg/mL = 10000 µL x 105,2 µg/mL

V_1 = 200 µL

Pembuatan larutan 10,52 µg/mL

Larutan 10,52 µg/mL digunakan untuk menentukan panjang gelombang maksimum

$V_1 \times C_1 = V_2 \times C_2$

9,99 µg/mL → V_1 x 105,2 µg/mL = 10000 µL x 9,99 µg/mL

V_1 = 1000 µL

Perhitungan kurva baku :

$V_1 \times C_1 = V_2 \times C_2$

- 0,63 µg/mL → V_1 x 105,2 µg/mL = 10000 µL x 0,63 µg/mL

  V_1 = 60 µL
- 0,99 µg/mL → V_1 x 105,2µg/mL = 10000 µL x 0,99 µg/mL

  V_1 = 94 µL
- 1,96 µg/mL → V_1 x 105,2µg/mL = 10000 µL x 1,96 µg/mL

  V_1 = 186 µL
- 2,92 µg/mL → V_1 x 105,2µg/mL = 10000 µL x 2,92 µg/mL

  V_1 = 227 µL

- 3,85 µg/mL → V_1 x 105,2µg/mL = 10000 µL x 3,85 µg/mL

  V_1 = 366 µL
- 5,67 µg/mL → V_1 x 105,2µg/mL = 10000 µL x 5,67 µg/mL

  V_1 =539 µL
- 7,43 µg/mL → V_1 x 105,2µg/mL = 10000 µL x 7,43 µg/mL

  V_1 = 706 µL

Hasil kurva kalibrasi resveratrol dalam metanol

Konsentrasi (µg/mL)	Absorbansi				
	I	II	III	IV	Rerata
0,63	0,076	0,076	0,074	0,072	0,075
0,99	0,136	0,138	0,132	0,131	0,134
1,96	0,275	0,275	0,263	0,263	0,269
2,92	0,403	0,403	0,433	0,432	0,418
3,85	0,555	0,556	0,552	0,552	0,554
5,67	0,797	0,800	0,785	0,786	0,792
7,43	1,033	1,030	1,044	1,045	1,038

B. Data kurva kalibrasi resveratrol dalam dapar fosfat *p*H 7,4

Perhitungan larutan induk

Berat penimbangan = 49,52 mg

$49{,}52\ {}^{mg}/_{10\ mL} = {}^{4952\ mg}/_{1000\ mL}$ = 4952 µg/mL

Pembuatan larutan stok 99,04 µg/mL

V_1 x C_1 = V_2 x C_2

V_1 x 4952 µg/mL = 10000 µL x 99,04 µg/mL

V_1 = 200 µL

Pembuatan larutan 9,90 µg/mL

Larutan 9,90 µg/mL digunakan untuk menentukan panjang gelombang maksimum

V_1 x C_1 = V_2 x C_2

9,90 µg/mL → V_1 x 99,04 µg/mL = 10000 µL x 9,90 µg/mL

V_1 = 1000 µL

Perhitungan kurva baku :

$V_1 \times C_1 = V_2 \times C_2$

- 0,49 µg/mL → V_1 x 99,04 µg/mL = 10000 µL x 0,49 µg/mL

  V_1 = 50 µL
- 0,98 µg/mL → V_1 x 99,04 µg/mL = 10000 µL x 0,98 µg/mL

  V_1 = 99 µL
- 1,94 µg/mL → V_1 x 99,04 µg/mL = 10000 µL x 1,94 µg/mL

  V_1 = 1896 µL
- 2,91 µg/mL → V_1 x 99,04 µg/mL = 10000 µL x 2,91 µg/mL

  V_1 = 294 µL
- 3,81 µg/mL → V_1 x 99,04 µg/mL = 10000 µL x 3,81 µg/mL

  V_1 = 385 µL
- 4,76 µg/mL → V_1 x 99,04 µg/mL = 10000 µL x 4,76 µg/mL

  V_1 =481 µL
- 5,65 µg/mL → V_1 x 99,04 µg/mL = 10000 µL x 5,65 µg/mL

  V_1 = 570 µL
- 6,52 µg/mL → V_1 x 99,04 µg/mL = 10000 µL x 6,52 µg/mL

  V_1 = 659 µL
- 7,40 µg/mL → V_1 x 99,04 µg/mL = 10000 µL x 7,40 µg/mL

  V_1 = 747 µL

Konsentrasi (µg/mL)	Absorbansi				
	I	II	III	IV	Rerata
0,49	0,076	0,078	0,065	0,066	0,071
0,98	0,103	0,103	0,102	0,102	0,103
1,94	0,215	0,218	0,019	0,208	0,208
2,91	0,340	0,340	0,337	0,339	0,339
3,81	0,435	0,434	0,427	0,427	0,431

4,76	0,553	0,553	0,548	0,548	0,551
5,65	0,648	0,647	0,651	0,650	0,649
6,52	0,753	0,752	0,759	0,758	0,756
7,40	0,862	0,862	0,852	0,850	0,857

C. Akurasi Resveratrol dalam metanol

%	Replikasi	Absorbansi	Konsentrasi (µg/mL)	Konsentrasi Sebenarnya (µg/mL)	% Perolehan Kembali
80%	1	0,410	2,94	2,92	101%
	2	0,415	2,97	2,92	102%
	3	0,412	2,95	2,92	101%
100%	1	0,544	3,89	3,85	101%
	2	0,546	3,90	3,85	101%
	3	0,549	3,92	3,85	102%
120%	1	0,791	5,64	5,67	99%
	2	0,789	5,62	5,67	99%
	3	0,793	5,65	5,67	100%
X rata-rata ± SD					100,62% ± 0,01

D. Resveratrol dalam dapar fosfat *p*H 7,4

%	Replikasi	Absorbansi	Konsentrasi (µg/mL)	Konsentrasi Sebenarnya (µg/mL)	% Perolehan Kembali
80%	1	0,547	4,79	4,76	101%
	2	0,543	4,76	4,76	100%
	3	0,549	4,81	4,76	101%
100%	1	0,643	5,63	5,65	100%
	2	0,652	5,71	5,65	101%
	3	0,649	5,68	5,65	101%
120%	1	0,759	6,64	6,52	102%
	2	0,752	6,58	6,52	101%
	3	0,756	6,61	6,52	101%
X rata-rata ±					100,77% ± 0,0068

SD

E. Presisi resveratrol dalam metanol

Replikasi	Konsentrasi (µg/mL)	Konsentrasi sebenarnya (µg/mL)	Absorbansi	%recovery
1	3,60	3,85	0,504	93,56
2	3,62	3,85	0,507	94,11
3	3,59	3,85	0,502	93,19
4	3,62	3,85	0,506	93,93
5	3,62	3,85	0,507	94,11
6	3,60	3,85	0,503	93,38
7	3,60	3,85	0,503	93,38
8	3,60	3,85	0,504	93,56
9	3,62	3,85	0,506	93,93
10	3,60	3,85	0,503	93,38
X rata-rata ± SD				93,65 ± 0,003214

F. Presisi resveratrol dalam PBS pH 7,4

Replikasi	Konsentrasi (µg/mL)	Konsentrasi sebenarnya (µg/mL)	Absorbansi	%recovery
1	5,62	5,65	0,504	99,50
2	5,64	5,65	0,507	99,81
3	5,65	5,65	0,502	99,96
4	5,54	5,65	0,506	98,13
5	5,59	5,65	0,507	98,89
6	5,65	5,65	0,503	99,96
7	5,65	5,65	0,503	99,96
8	5,62	5,65	0,504	99,50
9	5,67	5,65	0,506	100,27
10	5,54	5,65	0,503	97,98
X rata-rata ± SD				93,65 ± 0,003214

G. LOD dan LOQ resveratrol dalam metanol

Konsentrasi (x)	Absorbansi (y)	y'	y-y'	$(y-y')^2$
0,63	0,075	0,084181	-0,00918	8,43E-05
0,99	0,134	0,135349	-0,00135	1,82E-06
1,96	0,269	0,272463	-0,00346	1,2E-05
2,92	0,418	0,407045	0,010955	0,00012
3,85	0,554	0,539162	0,014838	0,00022
5,67	0,792	0,796275	-0,00427	1,83E-05
7,43	1,038	1,044306	-0,00631	3,98E-05
Jumlah				0,000496
Jumlah/n-2				8,27E-05
Akar jumlah/n-2				0,009095

Perhitungan nilai LOD dan LOQ

LOD = $\frac{3{,}3\ sy/x}{b} = \frac{3{,}3\ x\ 0{,}000496}{0{,}1411} = 0{,}21265$

LOQ = $\frac{10\ sy/x}{b} = \frac{10\ x\ 0{,}000496}{0{,}1411} = 0{,}6444$

H. LOD dan LOQ resveratrol dalam PBS pH 7,4

Konsentrasi (x)	Absorbansi (y)	y'	y-y'	$(y-y')^2$
0,49	0,071	0,053734	0,017516	0,000306821
0,98	0,103	0,110255	-0,00776	6,01435E-05
1,94	0,208	0,221638	-0,01364	0,000185996
2,91	0,339	0,333561	0,005439	2,95852E-05
3,81	0,431	0,437977	-0,00723	5,223E-05
4,76	0,551	0,548258	0,002242	5,02637E-06
5,65	0,649	0,651256	-0,00226	5,09041E-06
6,52	0,756	0,75233	0,00317	1,00493E-05
7,40	0,857	0,853991	0,002509	6,29469E-06
Jumlah				0,000654942
Jumlah/n-2				9,35632E-05
Akar jumlah/n-2				0,009672807

Perhitungan nilai LOD dan LOQ

$$\text{LOD} = \frac{3{,}3\ sy/x}{b} = \frac{3{,}3\ x\ 0{,}009672}{0{,}1158} = 0{,}27751$$

$$\text{LOQ} = \frac{10\ sy/x}{b} = \frac{10\ x\ 0{,}000496}{0{,}1158} = 0{,}8348$$

Lampiran 5. Hasil uji kelarutan resveratrol dalam pembawa

Komponen	Jenis	Serapan		Kadar (mg/mL)		Rata-rata ± SD
		Rep 1	Rep 2	Rep 1	Rep 2	
Minyak	Asam Oleat	0,130	0,134	7,37	7,59	7,48 ± 16,44
	Labrafac Lipophil	0,237	0,248	13,23	13,83	13,53 ± 16,44
	Miglyol	0,566	0,538	5,68	5,40	5,54 ± 16,44
	Capryol	0,745	0,743	41,07	40,96	41,02 ± 16,44
Surfaktan	Tween 80	0,117	0,124	5,36	5,67	5,51 ± 17,27
	Kolliphor EL	0,402	0,413	17,93	18,42	18,18 ± 17,27
	Labrasol	0,656	0,673	29,14	29,89	29,52 ± 17,27
	Labrafil	0,831	0,845	45,78	46,55	46,17 ± 17,27
Kosurfaktan	PEG 400	0,376	0,378	81,77	82,20	81,98 ± 24,01
	Transcutol CG	0,868	0,876	47,81	48,25	48,03 ± 24,01

Lampiran 6. Hasil uji ukuran partikel

Replikasi 1

Size Distribution Report by Intensity

v2.2

Malvern

Sample Details

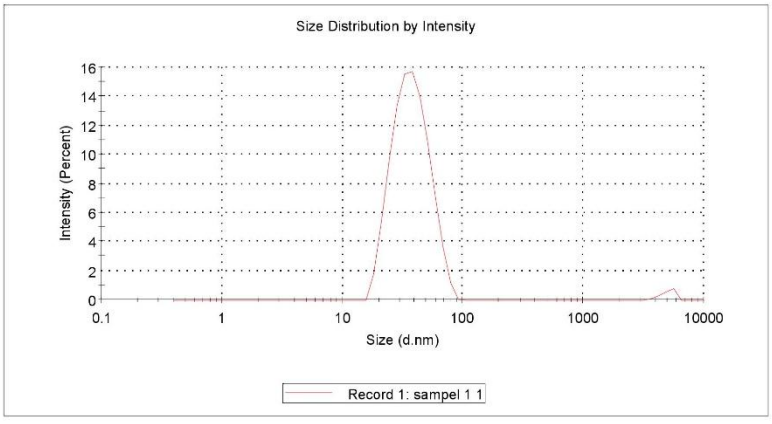
Sample Name:	sampel 1 1		
SOP Name:	mansettings.nano		
General Notes:			
File Name:	Anisa Devi 2019.dts	**Dispersant Name:**	Water
Record Number:	1	**Dispersant RI:**	1.330
Material RI:	1.33	**Viscosity (mPa.s):**	0.8872
Material Absorbtion:	0.500	**Measurement Date and Time:**	Friday, June 28, 2019 8:28:...

System

Temperature (°C):	25.0	**Duration Used (s):**	60
Count Rate (kcps):	262.6	**Measurement Position (mm):**	1.05
Cell Description:	Disposable sizing cuvette	**Attenuator:**	5

Results

			Size (d.nm...	% Intensity:	St Dev (d.n...
Z-Average (d.nm):	36.08	**Peak 1:**	38.53	98.2	12.95
PdI:	0.165	**Peak 2:**	4967	1.8	623.3
Intercept:	0.945	**Peak 3:**	0.000	0.0	0.000
Result quality	Good				



Replikasi 2

Size Distribution Report by Intensity

v2.2

Malvern

Sample Details

Sample Name: sampel 1 2
SOP Name: mansettings.nano
General Notes:

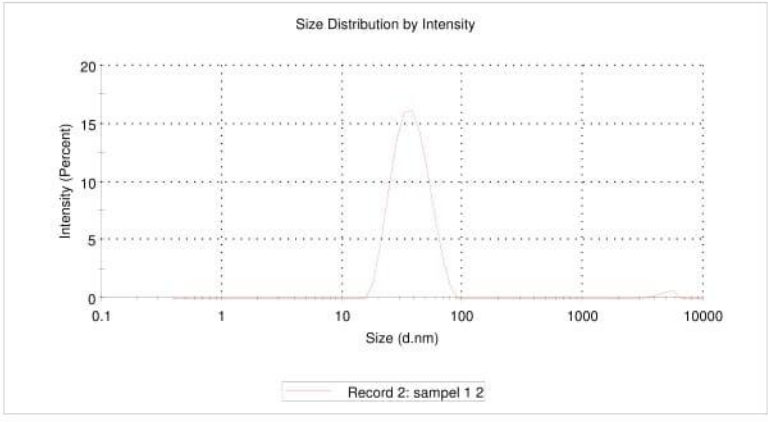
File Name:	Anisa Devi 2019.dts	**Dispersant Name:**	Water
Record Number:	2	**Dispersant RI:**	1.330
Material RI:	1.33	**Viscosity (mPa.s):**	0.8872
Material Absorbtion:	0.500	**Measurement Date and Time:**	Friday, June 28, 2019 8:30:...

System

Temperature (°C):	25.0	**Duration Used (s):**	60
Count Rate (kcps):	260.2	**Measurement Position (mm):**	1.05
Cell Description:	Disposable sizing cuvette	**Attenuator:**	5

Results

			Size (d.nm...	% Intensity:	St Dev (d.n...
Z-Average (d.nm):	36.04	**Peak 1:**	38.61	98.3	12.65
PdI:	0.159	**Peak 2:**	4875	1.7	685.1
Intercept:	0.946	**Peak 3:**	0.000	0.0	0.000
Result quality	Good				



Replikasi 3

Size Distribution Report by Intensity

v2.2

Malvern

Sample Details

Sample Name: sampel 1 5
SOP Name: mansettings.nano
General Notes:

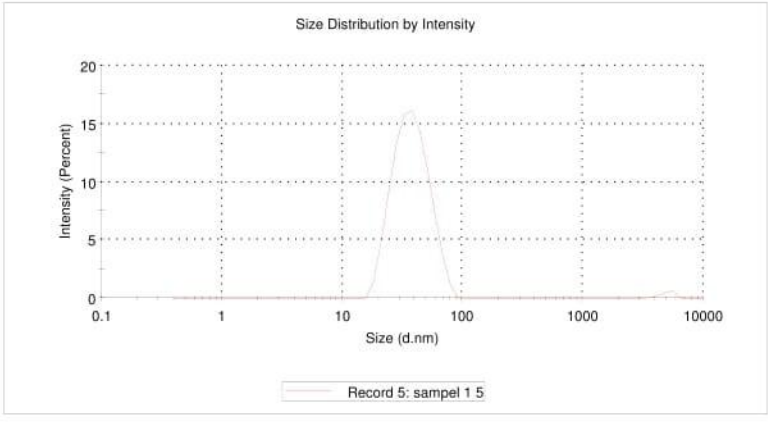
File Name:	Anisa Devi 2019.dts	**Dispersant Name:**	Water
Record Number:	5	**Dispersant RI:**	1.330
Material RI:	1.33	**Viscosity (mPa.s):**	0.8872
Material Absorbtion:	0.500	**Measurement Date and Time:**	Friday, June 28, 2019 8:37:...

System

Temperature (°C):	25.0	**Duration Used (s):**	60
Count Rate (kcps):	259.7	**Measurement Position (mm):**	1.05
Cell Description:	Disposable sizing cuvette	**Attenuator:**	5

Results

			Size (d.nm...	% Intensity:	St Dev (d.n...
Z-Average (d.nm):	36.07	**Peak 1:**	38.87	98.4	12.80
PdI:	0.168	**Peak 2:**	4942	1.6	639.9
Intercept:	0.947	**Peak 3:**	0.000	0.0	0.000
Result quality	Good				



Lampiran 7. Hasil uji potensial zeta

Replikasi 1

Zeta Potential Report

v2.3

Malvern

Sample Details

Sample Name: sampel 1 4
SOP Name: mansettings.nano
General Notes:

File Name: Anisa Devi 2019.dts
Record Number: 9
Date and Time: Friday, June 28, 2019 8:42:35 ...
Dispersant Name: Water
Dispersant RI: 1.330
Viscosity (cP): 0.8872
Dispersant Dielectric Constant: 78.5

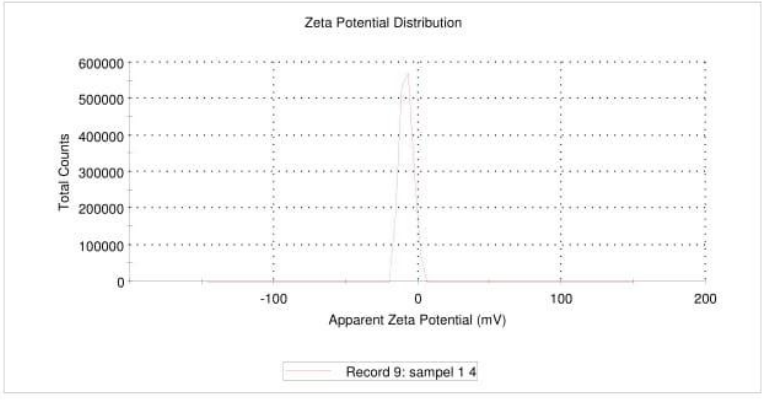
System

Temperature (°C): 25.0
Count Rate (kcps): 214.8
Cell Description: Zeta dip cell
Zeta Runs: 12
Measurement Position (mm): 4.50
Attenuator: 7

Results

		Mean (mV)	Area (%)	St Dev (mV)
Zeta Potential (mV): -7.99	**Peak 1:**	-7.99	100.0	4.46
Zeta Deviation (mV): 4.46	**Peak 2:**	0.00	0.0	0.00
Conductivity (mS/cm): 0.0975	**Peak 3:**	0.00	0.0	0.00

Result quality Good



Replikasi 2

Size Distribution Report by Intensity

v2.2

Malvern

Sample Details

Sample Name: sampel 1 5
SOP Name: mansettings.nano
General Notes:

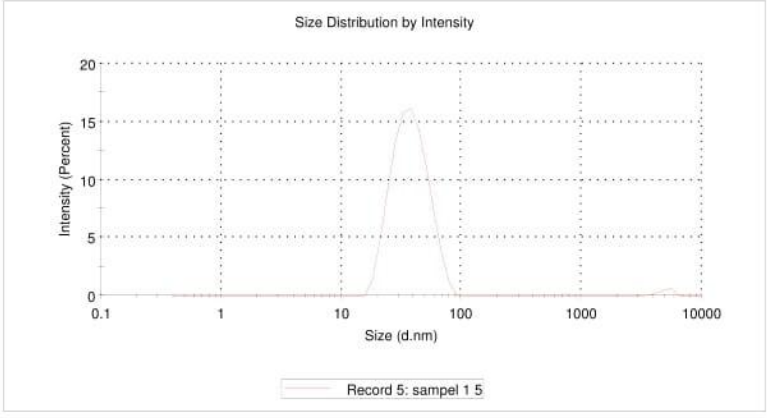
File Name:	Anisa Devi 2019.dts	**Dispersant Name:**	Water
Record Number:	5	**Dispersant RI:**	1.330
Material RI:	1.33	**Viscosity (mPa.s):**	0.8872
Material Absorbtion:	0.500	**Measurement Date and Time:**	Friday, June 28, 2019 8:37:...

System

Temperature (°C):	25.0	**Duration Used (s):**	60
Count Rate (kcps):	259.7	**Measurement Position (mm):**	1.05
Cell Description:	Disposable sizing cuvette	**Attenuator:**	5

Results

			Size (d.nm...	% Intensity:	St Dev (d.n...
Z-Average (d.nm):	36.07	**Peak 1:**	38.87	98.4	12.80
PdI:	0.168	**Peak 2:**	4942	1.6	639.9
Intercept:	0.947	**Peak 3:**	0.000	0.0	0.000
Result quality	Good				



Replikasi 3

Zeta Potential Report

v2.3

Malvern

Sample Details

Sample Name: sampel 1 3
SOP Name: mansettings.nano
General Notes:

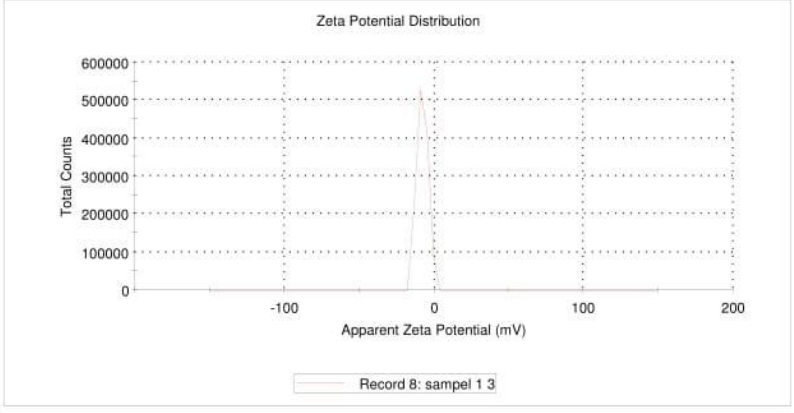
File Name: Anisa Devi 2019.dts
Record Number: 8
Date and Time: Friday, June 28, 2019 8:41:52 ...
Dispersant Name: Water
Dispersant RI: 1.330
Viscosity (cP): 0.8872
Dispersant Dielectric Constant: 78.5

System

Temperature (°C): 25.0
Count Rate (kcps): 65.6
Cell Description: Zeta dip cell
Zeta Runs: 13
Measurement Position (mm): 4.50
Attenuator: 7

Results

		Mean (mV)	Area (%)	St Dev (mV)
Zeta Potential (mV): -7.80	**Peak 1:**	-7.80	100.0	3.68
Zeta Deviation (mV): 3.68	**Peak 2:**	0.00	0.0	0.00
Conductivity (mS/cm): 0.0969	**Peak 3:**	0.00	0.0	0.00
Result quality Good				



Lampiran 8. Hasil profil *gelling agent*

A. Carbopol

Konsentrasi	Kertas + zat	Kertas sisa	Zat	Viskositas			Rata-rata
				1	2	3	
1,012	0,788	0,282	0,506	130	130	130	130
1,506	1,025	0,272	0,753	170	170	160	166,67
2,006	1,288	0,285	1,003	250	250	250	250
2,504	1,535	0,283	1,252	350	350	350	350
3,0544	1,797	0,270	1,5272	390	400	390	393,33

B. Kitosan

Konsentrasi	Kertas + zat	Kertas sisa	Zat	Viskositas			Rata-rata
				1	2	3	
5,012	3,594	1,088	2,506	110	110	110	110
5,50	3,034	0,284	2,75	170	170	150	163
6,018	3,294	0,285	3,009	250	240	250	247
6,50	3,531	0,281	3,25	300	300	300	300
7,096	3,820	0,272	3,548	470	470	470	470

Lampiran 9. Hasil persen transmitan

A. Minyak : Smix (4:6) dengan rasio Surfaktan : Kosurfaktan (1:1)

Konsentrasi	Persen transmitan (%)	
	Replikasi 1	Replikasi 2
1,01	90,1	90,3
2,04	88,3	87,9
3,03	85,2	84,5
4,22	81,8	81,8
5,10	80,9	80,6
6,08	77,2	77,2
7,24	75,5	76,3
7,77	74,5	74
9,13	73,3	73,5
10,02	58,1	58,2

B. Minyak : Smix (4:6) dengan rasio Surfaktan : Kosurfaktan (2:1)

Konsentrasi	Persen transmitan (%)	
	Replikasi 1	Replikasi 2
1,01	76,1	76,2
2,01	82,1	82,2
3,06	88,1	88,2
4,21	88,7	88,7
5,02	89,8	89,9
6,16	87,4	87,4
7,22	85,6	85,5
8,56	84,3	84,4
8,98	86,3	86,3
10,09	85,5	85,4

C. Minyak : Smix (2:8) dengan rasio Surfaktan : Kosurfaktan (2:1)

Konsentrasi	Persen transmitan (%)	
	Replikasi 1	Replikasi 2
1,01	81	80,6
1,96	49,7	49,8
2,93	35,4	35,3
4,10	29	28,9
4,87	17,5	17,3
5,91	17,4	17,4
6,89	18,2	18,2
8,05	16,1	16
9,00	15,7	15,6
10,12	12,6	12,5

Lampiran 10. Hasil *drug loading* nanoemulsi

A. Minyak : Smix (4:6) dengan rasio Surfaktan : Kosurfaktan (1:1)

	Serapan	Kadar (µg/mL)	rata-rata (µg/mL)	Pengenceran total	*Drug loading* (mg/mL)
Rep 1	0,421	3,01	2,93	30401	89,16
Rep 2	0,416	2,98			
Rep 3	0,397	2,84			
Rep 4	0,404	2,89			

Perhitungan kadar

Persamaan regresi linear

y = -0,0044 + 0,141132x

- 0,421 → x = $\frac{(0,421+0,0044)}{0,141132}$ = 0,00301 mg/mL
- 0,416 → x = $\frac{(0,416+0,0044)}{0,141132}$ = 0,00298 mg/mL
- 0,397 → x = $\frac{(0,397+0,0044)}{0,141132}$ = 0,00284 mg/mL
- 0,404 → x = $\frac{(0,404+0,0044)}{0,141132}$ = 0,00289 mg/mL

Perhitungan *drug loading*

Drug loading = rata-rata kadar x pengenceran total

= 0,00293 mg/mL x 30401

= 89,16 mg/mL

B. Minyak : Smix (4:6) dengan rasio Surfaktan : Kosurfaktan (2:1)

	Serapan	Kadar (µg/mL)	rata-rata (µg/mL)	Pengenceran total	*Drug loading* (mg/mL)
Rep 1	0,495	3,54	3,47	30401	105,42
Rep 2	0,469	3,35			
Rep 3	0,472	3,38			
Rep 4	0,504	3,60			

Perhitungan kadar

Persamaan regresi linear

y = -0,0044 + 0,141132x

- 0,495 → x = $\frac{(0,495+0,0044)}{0,141132}$ = 0,00354 mg/mL
- 0,469 → x = $\frac{(0,469+0,0044)}{0,141132}$ = 0,00335 mg/mL
- 0,472 → x = $\frac{(0,472+0,0044)}{0,141132}$ = 0,00338 mg/mL
- 0,504 → x = $\frac{(0,504+0,0044)}{0,141132}$ = 0,00504 mg/mL

Perhitungan *drug loading*

Drug loading = rata-rata kadar x pengenceran total

= 0,00347 mg/mL x 30401

= 105,42 mg/mL

C. Minyak : Smix (2:8) dengan rasio Surfaktan : Kosurfaktan (2:1)

	Serapan	Kadar (µg/mL)	rata-rata (µg/mL)	Pengenceran total	*Drug loading* (mg/mL)
Rep 1	0,361	2,59	2,68	30401	81,40
Rep 2	0,373	2,67			
Rep 3	0,373	2,67			
Rep 4	0,387	2,77			

Perhitungan kadar

Persamaan regresi linear

y = -0,0044 + 0,141132x

- 0,361 → x = $\frac{(0,361+0,0044)}{0,141132}$ = 0,00259 mg/mL
- 0,373 → x = $\frac{(0,373+0,0044)}{0,141132}$ = 0,00267 mg/mL

- 0,373 → x = $\frac{(0,397+0,0044)}{0,141132}$ = 0,00267 mg/mL
- 0,387 → x = $\frac{(0,387+0,0044)}{0,141132}$ = 0,00277 mg/mL

Perhitungan *drug loading*

Drug loading = rata-rata kadar x pengenceran total

= 0,00268 mg/mL x 30401

= 81,40 mg/mL

Lampiran 11. Hasil uji penetrasi nano-emulgel resveratrol

A. Hasil kadar nano-emulgel resveratrol tiap kali sampling

Formula 1

Waktu (menit)	Serapan			Kadar		
	Rep 1	Rep 2	Rep 3	Rep 1	Rep 2	Rep 3
5	0,061	0,060	0,063	0,56	0,55	0,57
10	0,063	0,062	0,065	0,57	0,56	0,59
15	0,080	0,079	0,082	0,72	0,71	0,74
30	0,133	0,132	0,135	1,18	1,17	1,19
45	0,138	0,138	0,140	1,22	1,22	1,24
60	0,189	0,187	0,190	1,66	1,64	1,67
90	0,202	0,201	0,204	1,77	1,76	1,79

Formula 2

Waktu (menit)	Serapan			Kadar		
	Rep 1	Rep 2	Rep 3	Rep 1	Rep 2	Rep 3
5	0,018	0,015	0,020	0,18	0,16	0,20
10	0,018	0,017	0,022	0,18	0,18	0,22
15	0,023	0,022	0,024	0,23	0,22	0,24
30	0,025	0,024	0,027	0,25	0,24	0,26
45	0,030	0,027	0,032	0,29	0,26	0,31
60	0,033	0,030	0,035	0,31	0,29	0,33
90	0,039	0,036	0,041	0,37	0,34	0,38

Formula 3

Waktu (menit)	Serapan			Kadar		
	Rep 1	Rep 2	Rep 3	Rep 1	Rep 2	Rep 3
5	0,052	0,054	0,050	0,48	0,50	0,46
10	0,066	0,068	0,064	0,60	0,62	0,58
15	0,077	0,079	0,075	0,69	0,71	0,68
30	0,091	0,094	0,088	0,81	0,84	0,79
45	0,096	0,098	0,094	0,86	0,87	0,84
60	0,097	0,100	0,095	0,87	0,89	0,85
90	0,110	0,113	0,100	0,98	1,00	0,89

Formula 4

Waktu (menit)	Serapan			Kadar		
	Rep 1	Rep 2	Rep 3	Rep 1	Rep 2	Rep 3
5	0,019	0,022	0,018	0,19	0,22	0,18
10	0,021	0,024	0,020	0,21	0,24	0,20
15	0,027	0,030	0,026	0,26	0,29	0,25
30	0,029	0,032	0,029	0,28	0,31	0,28
45	0,030	0,033	0,030	0,29	0,31	0,29
60	0,032	0,034	0,031	0,31	0,32	0,30
90	0,043	0,046	0,042	0,40	0,43	0,39

Perhitungan kadar menggunakan persamaan regresi linear resveratrol dalam dapar fosfat *p*H 7,4 dengan persamaan :

$$Y = -0,0034 + 0,1159x$$

B. Hasil kumulatif sediaan nano-emulgel tiap kali sampling

Formula 1

Waktu (menit)	Total koreksi			Kumulatif (µg/cm2)		
	Rep 1	Rep 2	Rep 3	Rep 1	Rep 2	Rep 3
5	0	0	0	1,46	1,43	1,50
10	1,67	1,64	1,72	1,79	1,77	1,85
15	3,39	3,33	3,49	2,48	2,45	2,54
30	5,54	5,47	5,70	4,05	4,02	4,13
45	9,08	8,97	9,28	4,78	4,77	4,87
60	12,74	12,63	12,99	6,58	6,51	6,64
90	17,72	17,56	18,00	7,74	7,69	7,84

Formula 2

Waktu (menit)	Total koreksi			Kumulatif (µg/cm2)		
	Rep 1	Rep 2	Rep 3	Rep 1	Rep 2	Rep 3
5	0	0	0	0,48	0,42	0,53
10	0,55	0,48	0,61	0,58	0,54	0,68
15	1,11	1,00	1,26	0,79	0,75	0,84
30	1,79	1,66	1,97	0,96	0,91	1,03
45	2,53	2,37	2,76	1,20	1,10	1,28
60	3,39	3,16	3,68	1,42	1,31	1,51
90	4,33	4,02	4,67	1,72	1,59	1,82

Formula 3

Waktu (menit)	Total koreksi			Kumulatif (µg/cm2)		
	Rep 1	Rep 2	Rep 3	Rep 1	Rep 2	Rep 3
5	0	0	0	1,25	1,30	1,21
10	1,43	1,49	1,38	1,82	1,87	1,77
15	3,23	3,33	3,13	2,38	2,45	2,32
30	5,31	5,47	5,16	3,06	3,16	2,97
45	7,75	7,99	7,52	3,60	3,69	3,52
60	10,33	10,61	10,04	4,08	4,19	3,98
90	12,93	13,29	12,59	4,82	4,95	4,54

Formula 4

Waktu (menit)	Total koreksi			Kumulatif (µg/cm2)		
	Rep 1	Rep 2	Rep 3	Rep 1	Rep 2	Rep 3
5	0	0	0	0,51	0,57	0,48
10	0,58	0,66	0,55	0,65	0,73	0,63
15	1,21	1,37	1,16	0,90	0,99	0,87
30	2,00	2,23	1,92	1,08	1,19	1,07
45	2,84	3,15	2,76	1,25	1,37	1,24
60	3,70	4,09	3,62	1,45	1,56	1,41
90	4,62	5,06	4,51	1,86	2,00	1,82

C. Hasil Fluks sediaan nano-emulgel

Formula	Fluks ((µg/cm2/jam) ± SD
F1	0,209 ± 0,00114
F2	1,142 ± 0,05700
F3	0,394 ± 0,01333
F4	1,066 ± 0,03551

D. Hasil AUC total sediaan nano-emulgel

Formula	AUC total ((µg.menit/cm2) ± SD
F1	438,6193 ± 5,0368
F2	103,1262 ± 7,3332
F3	302,6347 ± 9,3716
F4	112,6889 ± 6,5029

Lampiran 12. Hasil uji aktivitas antioksidan resveratrol dalam metanol

A. Penentuan *operating time* resveratrol

Waktu (menit)	Serapan	Waktu (menit)	Serapan
0	0,264	31	0,117
1	0,208	32	0,117
2	0,183	33	0,117
3	0,168	34	0,117
4	0,158	35	0,117
5	0,150	36	0,117
6	0,145	37	0,117
7	0,140	38	0,117
8	0,137	39	0,117
9	0,134	40	0,117
10	0,131	41	0,118
11	0,129	42	0,118
12	0,127	43	0,118
13	0,126	44	0,118
14	0,125	45	0,118
15	0,124	46	0,118
16	0,123	47	0,118
17	0,122	48	0,118
18	0,121	49	0,118
19	0,121	50	0,118
20	0,120	51	0,118
21	0,120	52	0,118
22	0,119	53	0,118
23	0,119	54	0,118
24	0,119	55	0,118
25	0,119	56	0,118
26	0,118	57	0,118
27	0,118	58	0,118
28	0,118	59	0,118
29	0,117	60	0,118
30	0,117		

B. Hasil uji DPPH resveratrol dalam metanol

Absorbansi kontrol DPPH = 0,910

Replikasi 1		Replikasi 2		Replikasi 3		Replikasi 4	
Serapan	Inhibisi (%)	Serapan	Inhibisi (%)	Serapan	Inhibisi (%)	Serapan	Inhibisi (%)
0,118	87,03	0,117	87,14	0,109	88,02	0,107	88,24
0,260	71,42	0,260	71,42	0,265	70,87	0,265	70,87
0,452	50,31	0,452	50,31	0,361	60,31	0,360	60,42
0,594	34,70	0,594	34,70	0,556	38,87	0,555	38,98
0,703	22,71	0,704	22,60	0,692	23,92	0,692	23,92
0,771	15,24	0,772	15,13	0,732	19,53	0,732	19,53

Konsentrasi (µg/mL)	Inhibisi (%)
35,80	87,60
18,23	71,14
9,32	55,34
4,68	36,81
2,35	23,29
1,48	17,35

C. Perhitungan IC_{50} resveratrol

Persamaan :

$y = 22{,}647 \ln(x) + 5{,}1687$

$IC_{50} \rightarrow \ln(x) = \frac{50-5{,}1687}{22{,}647}$

$x = 7{,}24$ µg//mL

Lampiran 13. Hasil aktivitas antioksidan nano-emulgel resveratrol

Inhibisi resveratrol dalam metanol 8 µg/mL

y = 22,647 ln(x) + 5,1687

8 µg/mL → y = 22,647 ln(8) + 5,1687

y = 52,26 %

Formula	rep 1		rep 2		rep 3	
	abs	inhibisi	abs	inhibisi	Abs	inhibisi
F1	0,584	29,64	0,586	29,40	0,583	29,76
F2	0,594	28,43	0,591	28,80	0,592	28,67
F3	0,522	37,11	0,525	36,75	0,521	37,23
F4	0,529	36,27	0,527	36,51	0,528	36,39

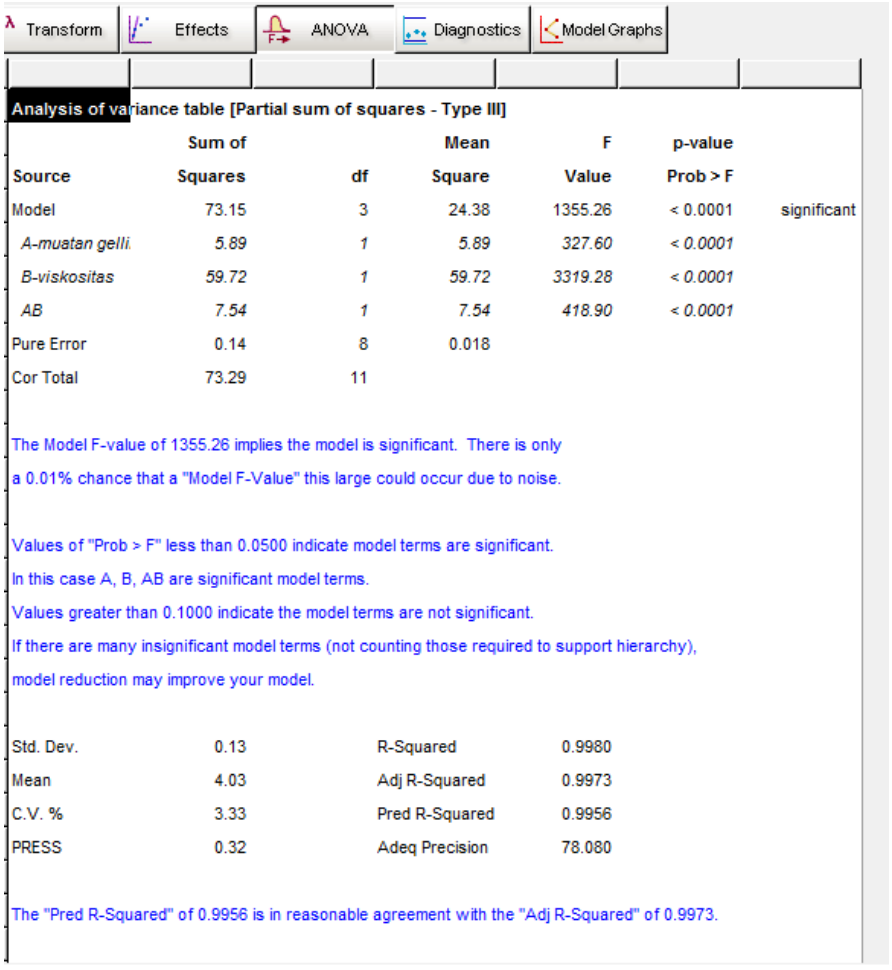
Formula	**Perubahan inhibisi (%)**		
	Rep 1	**Rep 2**	**Rep 3**
F1	43,29	43,75	43,06
F2	45,59	44,90	45,13
F3	29,00	29,69	28,76
F4	30,61	30,15	30,38

Rumus perhitungan perubahan inhibisi :

Perubahan inhibisi = $\frac{inhibisi\ resveratrol - inhibisi\ sediaan}{inhibisi\ resveratrol} x\ 100\%$

Lampiran 14. Hasil uji *design expert*

A. Kumulatif



Transform | Effects | ANOVA | Diagnostics | Model Graphs

Analysis of variance table [Partial sum of squares - Type III]

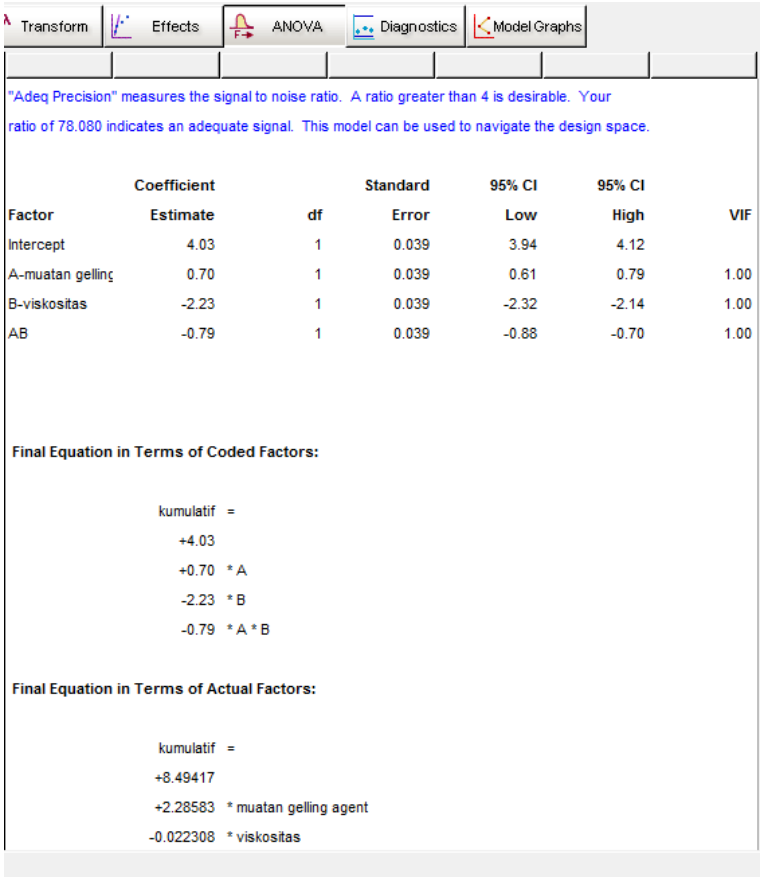
Source	Sum of Squares	df	Mean Square	F Value	p-value Prob > F	
Model	73.15	3	24.38	1355.26	< 0.0001	significant
A-muatan gelli	*5.89*	*1*	*5.89*	*327.60*	*< 0.0001*	
B-viskositas	*59.72*	*1*	*59.72*	*3319.28*	*< 0.0001*	
AB	*7.54*	*1*	*7.54*	*418.90*	*< 0.0001*	
Pure Error	0.14	8	0.018			
Cor Total	73.29	11				

The Model F-value of 1355.26 implies the model is significant. There is only a 0.01% chance that a "Model F-Value" this large could occur due to noise.

Values of "Prob > F" less than 0.0500 indicate model terms are significant.
In this case A, B, AB are significant model terms.
Values greater than 0.1000 indicate the model terms are not significant.
If there are many insignificant model terms (not counting those required to support hierarchy), model reduction may improve your model.

Std. Dev.	0.13	R-Squared	0.9980
Mean	4.03	Adj R-Squared	0.9973
C.V. %	3.33	Pred R-Squared	0.9956
PRESS	0.32	Adeq Precision	78.080

The "Pred R-Squared" of 0.9956 is in reasonable agreement with the "Adj R-Squared" of 0.9973.



"Adeq Precision" measures the signal to noise ratio. A ratio greater than 4 is desirable. Your ratio of 78.080 indicates an adequate signal. This model can be used to navigate the design space.

Factor	Coefficient Estimate	df	Standard Error	95% CI Low	95% CI High	VIF
Intercept	4.03	1	0.039	3.94	4.12	
A-muatan gelling	0.70	1	0.039	0.61	0.79	1.00
B-viskositas	-2.23	1	0.039	-2.32	-2.14	1.00
AB	-0.79	1	0.039	-0.88	-0.70	1.00

Final Equation in Terms of Coded Factors:

kumulatif =
+4.03
+0.70 * A
-2.23 * B
-0.79 * A * B

Final Equation in Terms of Actual Factors:

kumulatif =
+8.49417
+2.28583 * muatan gelling agent
-0.022308 * viskositas

kumulatif =

+4.03

+0.70 * A

-2.23 * B

-0.79 * A * B

Final Equation in Terms of Actual Factors:

kumulatif =

+8.49417

+2.28583 * muatan gelling agent

-0.022308 * viskositas

-7.92500E-003 * muatan gelling agent * viskositas

The Diagnostics Case Statistics Report has been moved to the Diagnostics Node.

In the Diagnostics Node, Select Case Statistics from the View Menu.

Proceed to Diagnostic Plots (the next icon in progression). Be sure to look at the:

1) Normal probability plot of the studentized residuals to check for normality of residuals.

2) Studentized residuals versus predicted values to check for constant error.

3) Externally Studentized Residuals to look for outliers, i.e., influential values.

4) Box-Cox plot for power transformations.

If all the model statistics and diagnostic plots are OK, finish up with the Model Graphs icon.

B. Fluks

ANOVA for selected factorial model

Analysis of variance table [Partial sum of squares - Type III]

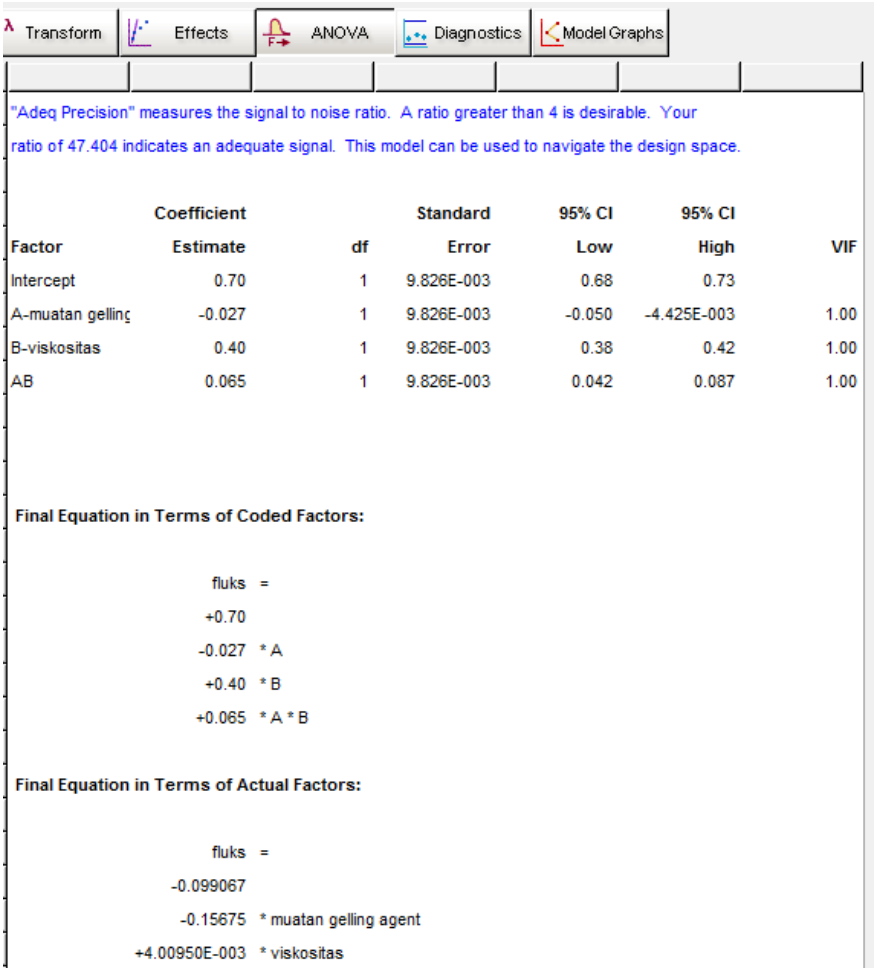
Source	Sum of Squares	df	Mean Square	F Value	p-value Prob > F	
Model	1.99	3	0.66	572.09	< 0.0001	significant
A-muatan gelli	*8.802E-003*	*1*	*8.802E-003*	*7.60*	*0.0248*	
B-viskositas	*1.93*	*1*	*1.93*	*1665.13*	*< 0.0001*	
AB	*0.050*	*1*	*0.050*	*43.54*	*0.0002*	
Pure Error	9.268E-003	8	1.159E-003			
Cor Total	2.00	11				

The Model F-value of 572.09 implies the model is significant. There is only a 0.01% chance that a "Model F-Value" this large could occur due to noise.

Values of "Prob > F" less than 0.0500 indicate model terms are significant.
In this case A, B, AB are significant model terms.
Values greater than 0.1000 indicate the model terms are not significant.
If there are many insignificant model terms (not counting those required to support hierarchy), model reduction may improve your model.

Std. Dev.	0.034	R-Squared	0.9954
Mean	0.70	Adj R-Squared	0.9936
C.V. %	4.84	Pred R-Squared	0.9896
PRESS	0.021	Adeq Precision	47.404

The "Pred R-Squared" of 0.9896 is in reasonable agreement with the "Adj R-Squared" of 0.9936.



"Adeq Precision" measures the signal to noise ratio. A ratio greater than 4 is desirable. Your ratio of 47.404 indicates an adequate signal. This model can be used to navigate the design space.

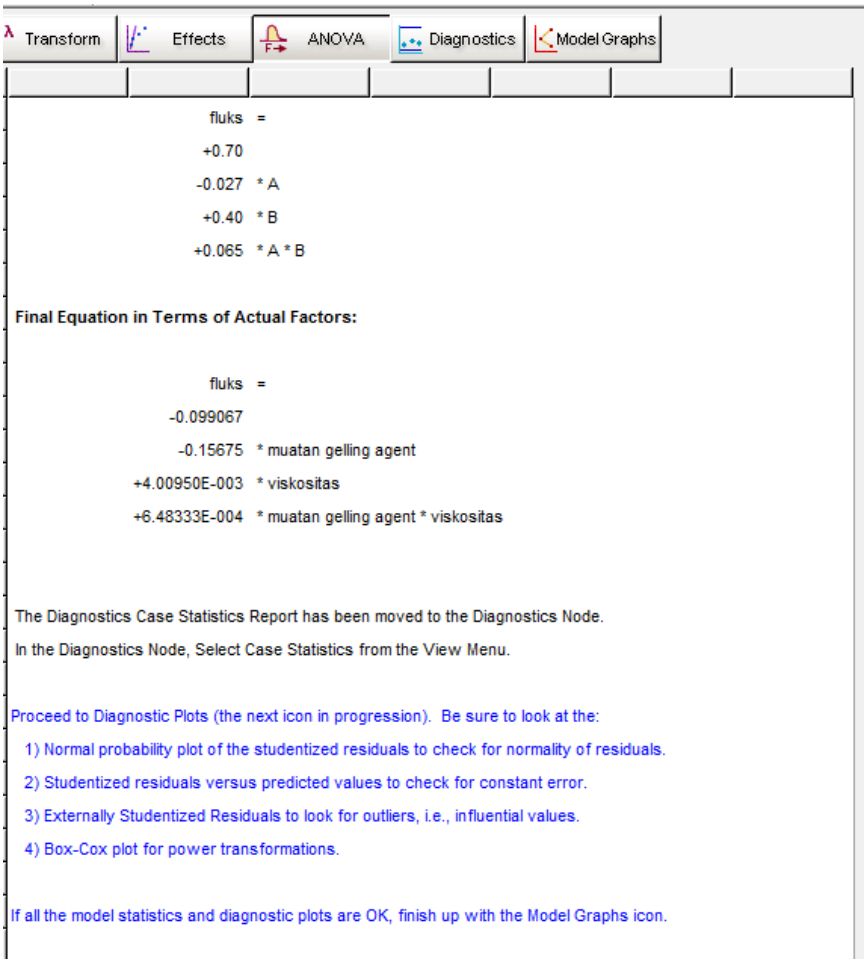
Factor	Coefficient Estimate	df	Standard Error	95% CI Low	95% CI High	VIF
Intercept	0.70	1	9.826E-003	0.68	0.73	
A-muatan gelling	-0.027	1	9.826E-003	-0.050	-4.425E-003	1.00
B-viskositas	0.40	1	9.826E-003	0.38	0.42	1.00
AB	0.065	1	9.826E-003	0.042	0.087	1.00

Final Equation in Terms of Coded Factors:

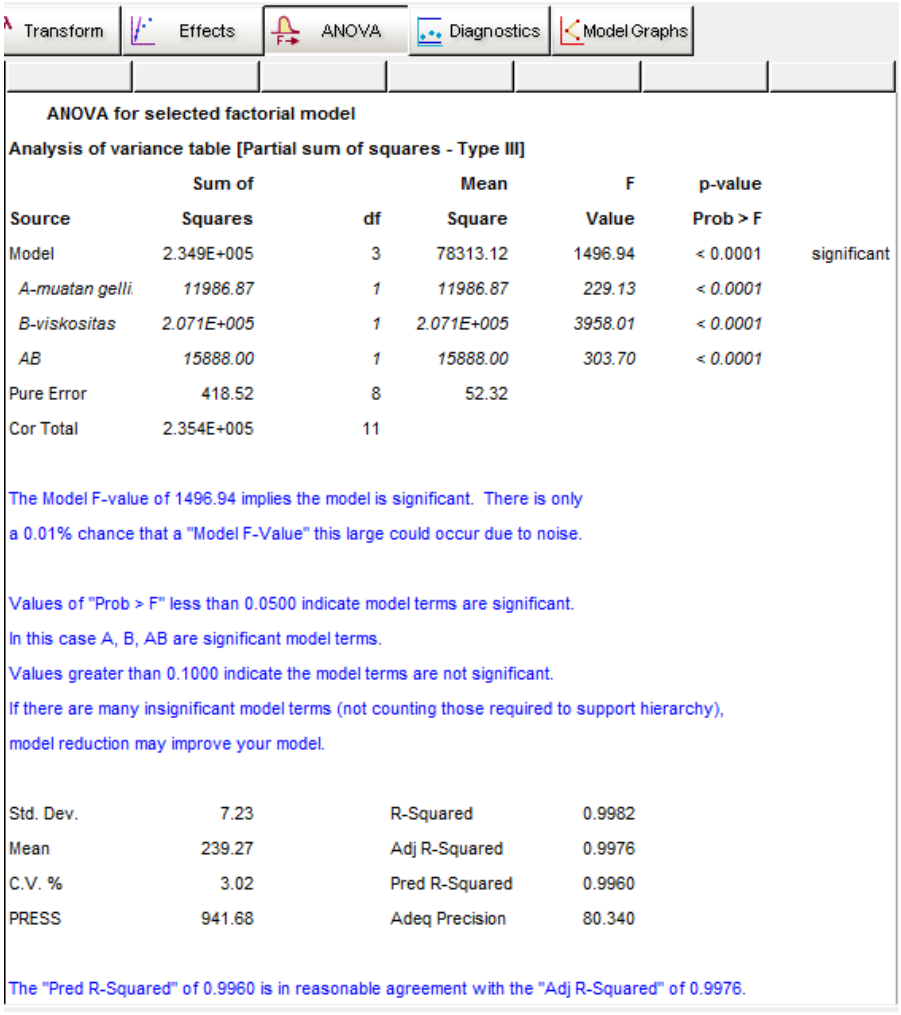
fluks =
+0.70
-0.027 * A
+0.40 * B
+0.065 * A * B

Final Equation in Terms of Actual Factors:

fluks =
-0.099067
-0.15675 * muatan gelling agent
+4.00950E-003 * viskositas


Transform
Effects
ANOVA
Diagnostics
Model Graphs
fluks =
+0.70
-0.027 * A
+0.40 * B
+0.065 * A * B
Final Equation in Terms of Actual Factors:
fluks =
-0.099067
-0.15675 * muatan gelling agent
+4.00950E-003 * viskositas
+6.48333E-004 * muatan gelling agent * viskositas
The Diagnostics Case Statistics Report has been moved to the Diagnostics Node.
In the Diagnostics Node, Select Case Statistics from the View Menu.
Proceed to Diagnostic Plots (the next icon in progression). Be sure to look at the:
1) Normal probability plot of the studentized residuals to check for normality of residuals.
2) Studentized residuals versus predicted values to check for constant error.
3) Externally Studentized Residuals to look for outliers, i.e., influential values.
4) Box-Cox plot for power transformations.
If all the model statistics and diagnostic plots are OK, finish up with the Model Graphs icon.

C. AUC total



Transform | Effects | ANOVA | Diagnostics | Model Graphs

ANOVA for selected factorial model

Analysis of variance table [Partial sum of squares - Type III]

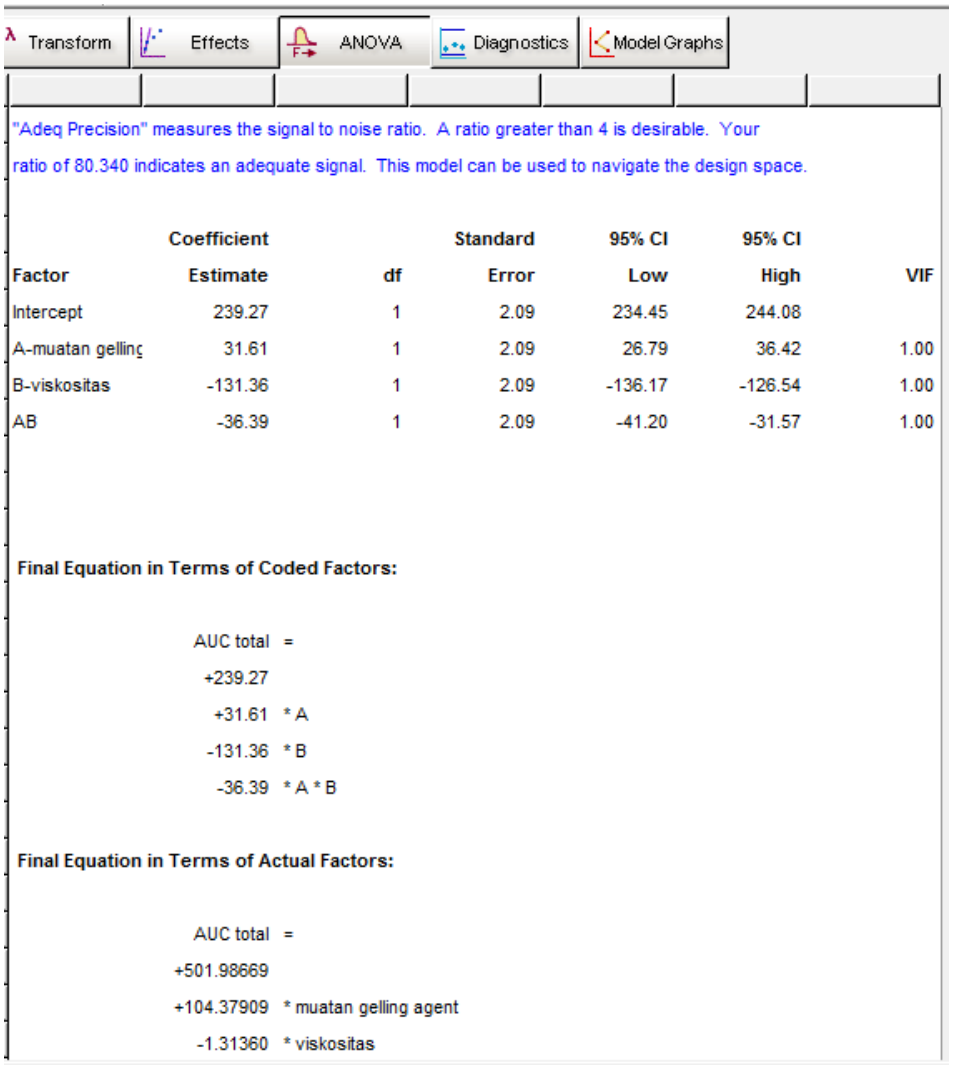
Source	Sum of Squares	df	Mean Square	F Value	p-value Prob > F	
Model	2.349E+005	3	78313.12	1496.94	< 0.0001	significant
A-muatan gelli	*11986.87*	*1*	*11986.87*	*229.13*	*< 0.0001*	
B-viskositas	*2.071E+005*	*1*	*2.071E+005*	*3958.01*	*< 0.0001*	
AB	*15888.00*	*1*	*15888.00*	*303.70*	*< 0.0001*	
Pure Error	418.52	8	52.32			
Cor Total	2.354E+005	11				

The Model F-value of 1496.94 implies the model is significant. There is only a 0.01% chance that a "Model F-Value" this large could occur due to noise.

Values of "Prob > F" less than 0.0500 indicate model terms are significant.
In this case A, B, AB are significant model terms.
Values greater than 0.1000 indicate the model terms are not significant.
If there are many insignificant model terms (not counting those required to support hierarchy), model reduction may improve your model.

Std. Dev.	7.23	R-Squared	0.9982
Mean	239.27	Adj R-Squared	0.9976
C.V. %	3.02	Pred R-Squared	0.9960
PRESS	941.68	Adeq Precision	80.340

The "Pred R-Squared" of 0.9960 is in reasonable agreement with the "Adj R-Squared" of 0.9976.



"Adeq Precision" measures the signal to noise ratio. A ratio greater than 4 is desirable. Your ratio of 80.340 indicates an adequate signal. This model can be used to navigate the design space.

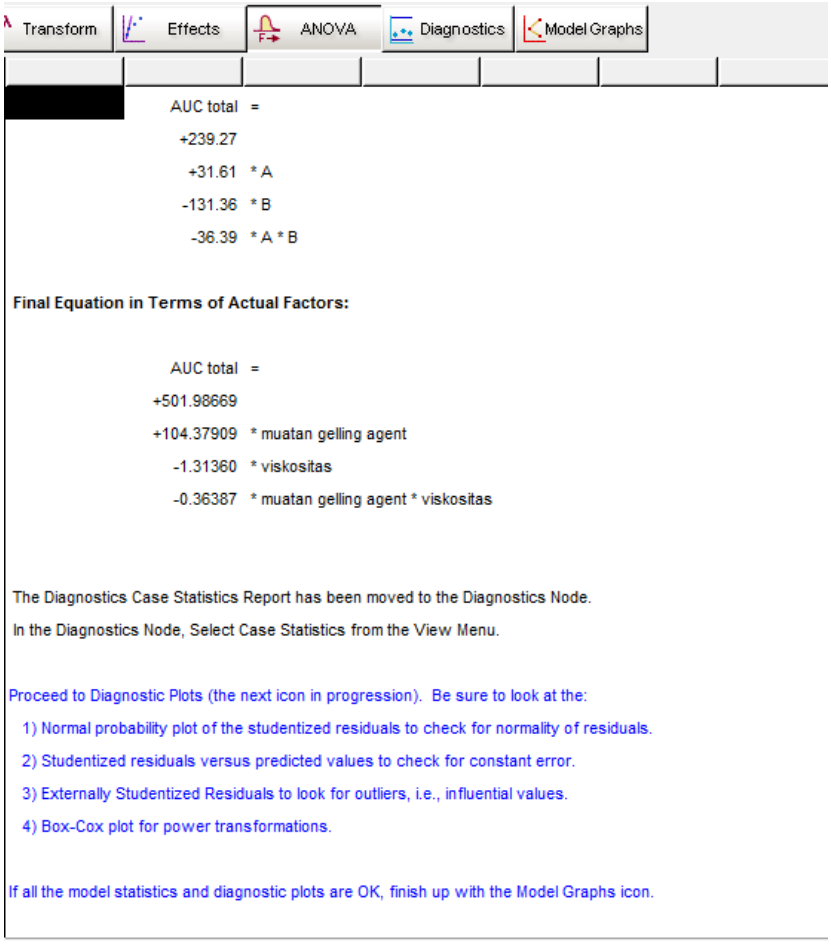
Factor	Coefficient Estimate	df	Standard Error	95% CI Low	95% CI High	VIF
Intercept	239.27	1	2.09	234.45	244.08	
A-muatan gelling	31.61	1	2.09	26.79	36.42	1.00
B-viskositas	-131.36	1	2.09	-136.17	-126.54	1.00
AB	-36.39	1	2.09	-41.20	-31.57	1.00

Final Equation in Terms of Coded Factors:

AUC total =
+239.27
+31.61 * A
-131.36 * B
-36.39 * A * B

Final Equation in Terms of Actual Factors:

AUC total =
+501.98669
+104.37909 * muatan gelling agent
-1.31360 * viskositas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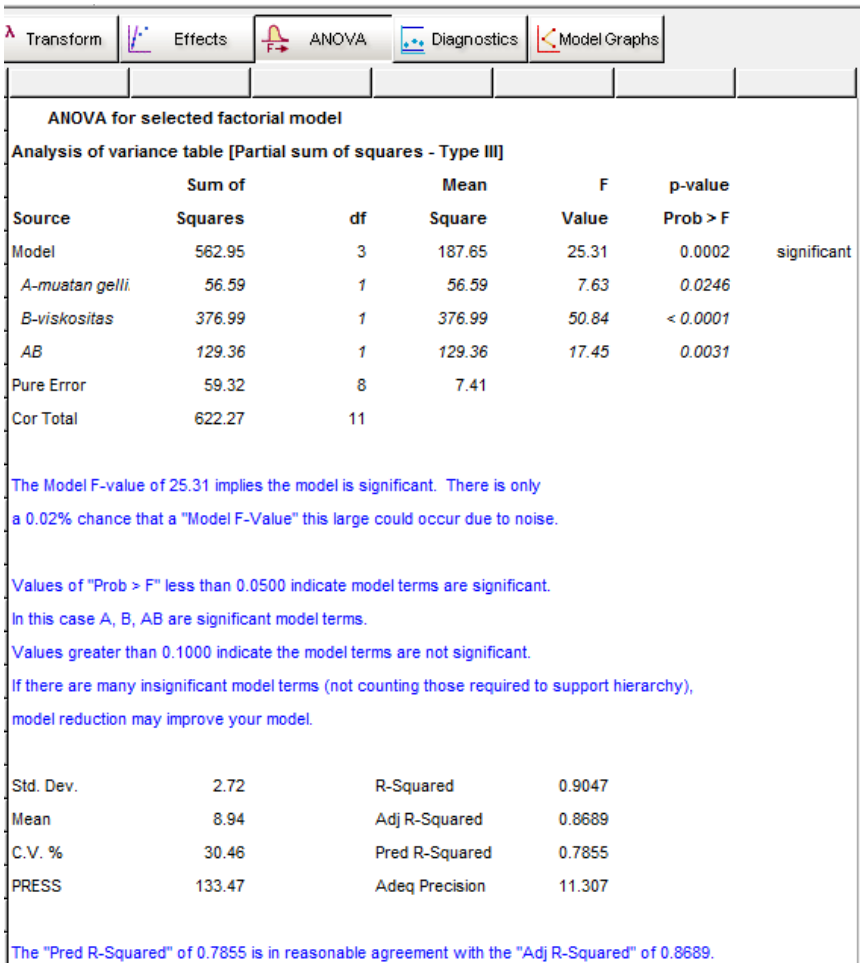
Model Graphs
AUC total =
+239.27
+31.61 * A
-131.36 * B
-36.39 * A * B
Final Equation in Terms of Actual Factors:
AUC total =
+501.98669
+104.37909 * muatan gelling agent
-1.31360 * viskositas
-0.36387 * muatan gelling agent * viskositas
The Diagnostics Case Statistics Report has been moved to the Diagnostics Node.
In the Diagnostics Node, Select Case Statistics from the View Menu.
Proceed to Diagnostic Plots (the next icon in progression). Be sure to look at the:
1) Normal probability plot of the studentized residuals to check for normality of residuals.
2) Studentized residuals versus predicted values to check for constant error.
3) Externally Studentized Residuals to look for outliers, i.e., influential values.
4) Box-Cox plot for power transformations.
If all the model statistics and diagnostic plots are OK, finish up with the Model Graphs icon.

D. Perubahan viskositas



Transform | Effects | ANOVA | Diagnostics | Model Graphs

ANOVA for selected factorial model

Analysis of variance table [Partial sum of squares - Type III]

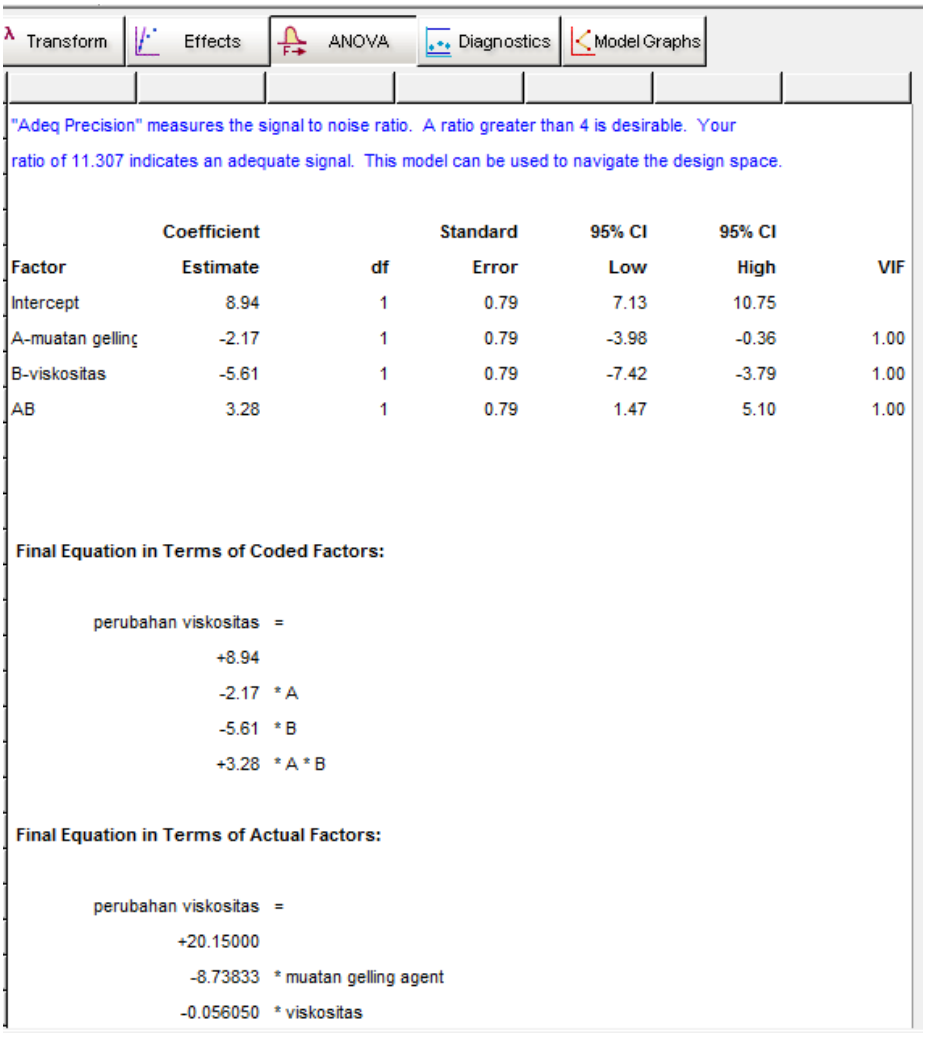
Source	Sum of Squares	df	Mean Square	F Value	p-value Prob > F	
Model	562.95	3	187.65	25.31	0.0002	significant
A-muatan gelli	*56.59*	*1*	*56.59*	*7.63*	*0.0246*	
B-viskositas	*376.99*	*1*	*376.99*	*50.84*	*< 0.0001*	
AB	*129.36*	*1*	*129.36*	*17.45*	*0.0031*	
Pure Error	59.32	8	7.41			
Cor Total	622.27	11				

The Model F-value of 25.31 implies the model is significant. There is only a 0.02% chance that a "Model F-Value" this large could occur due to noise.

Values of "Prob > F" less than 0.0500 indicate model terms are significant.
In this case A, B, AB are significant model terms.
Values greater than 0.1000 indicate the model terms are not significant.
If there are many insignificant model terms (not counting those required to support hierarchy), model reduction may improve your model.

Std. Dev.	2.72	R-Squared	0.9047
Mean	8.94	Adj R-Squared	0.8689
C.V. %	30.46	Pred R-Squared	0.7855
PRESS	133.47	Adeq Precision	11.307

The "Pred R-Squared" of 0.7855 is in reasonable agreement with the "Adj R-Squared" of 0.8689.



"Adeq Precision" measures the signal to noise ratio. A ratio greater than 4 is desirable. Your ratio of 11.307 indicates an adequate signal. This model can be used to navigate the design space.

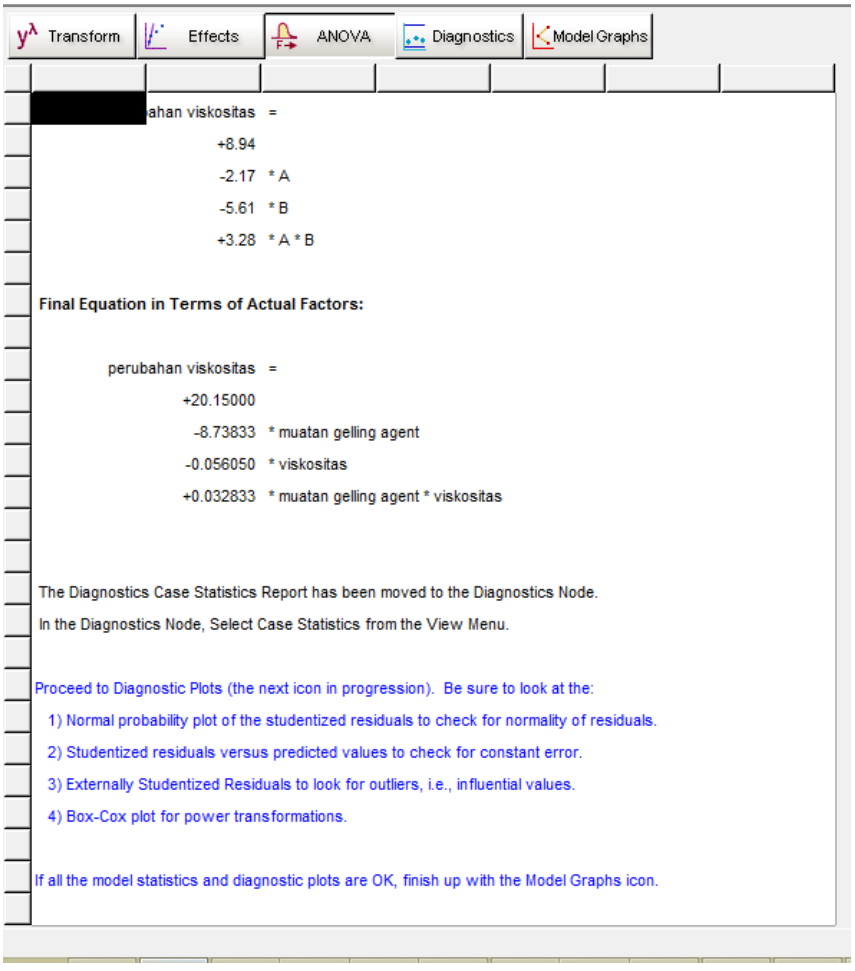
Factor	Coefficient Estimate	df	Standard Error	95% CI Low	95% CI High	VIF
Intercept	8.94	1	0.79	7.13	10.75	
A-muatan gelling	-2.17	1	0.79	-3.98	-0.36	1.00
B-viskositas	-5.61	1	0.79	-7.42	-3.79	1.00
AB	3.28	1	0.79	1.47	5.10	1.00

Final Equation in Terms of Coded Factors:

perubahan viskositas =
+8.94
-2.17 * A
-5.61 * B
+3.28 * A * B

Final Equation in Terms of Actual Factors:

perubahan viskositas =
+20.15000
-8.73833 * muatan gelling agent
-0.056050 * viskositas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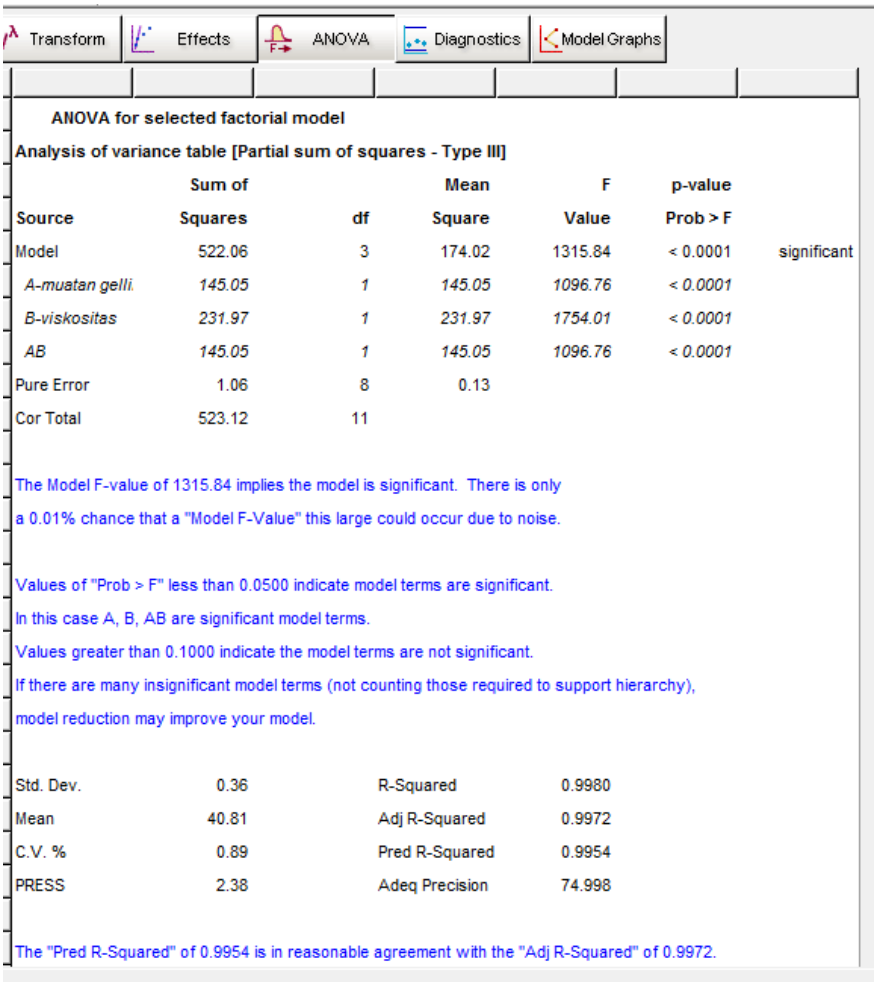
Model Graphs
ahan viskositas =
+8.94
-2.17 * A
-5.61 * B
+3.28 * A * B
Final Equation in Terms of Actual Factors:
perubahan viskositas =
+20.15000
-8.73833 * muatan gelling agent
-0.056050 * viskositas
+0.032833 * muatan gelling agent * viskositas
The Diagnostics Case Statistics Report has been moved to the Diagnostics Node.
In the Diagnostics Node, Select Case Statistics from the View Menu.
Proceed to Diagnostic Plots (the next icon in progression). Be sure to look at the:
1) Normal probability plot of the studentized residuals to check for normality of residuals.
2) Studentized residuals versus predicted values to check for constant error.
3) Externally Studentized Residuals to look for outliers, i.e., influential values.
4) Box-Cox plot for power transformations.
If all the model statistics and diagnostic plots are OK, finish up with the Model Graphs icon.

E. Perubahan inhibisi



Transform | Effects | ANOVA | Diagnostics | Model Graphs

ANOVA for selected factorial model

Analysis of variance table [Partial sum of squares - Type III]

Source	Sum of Squares	df	Mean Square	F Value	p-value Prob > F	
Model	522.06	3	174.02	1315.84	< 0.0001	significant
A-muatan gelli	*145.05*	*1*	*145.05*	*1096.76*	*< 0.0001*	
B-viskositas	*231.97*	*1*	*231.97*	*1754.01*	*< 0.0001*	
AB	*145.05*	*1*	*145.05*	*1096.76*	*< 0.0001*	
Pure Error	1.06	8	0.13			
Cor Total	523.12	11				

The Model F-value of 1315.84 implies the model is significant. There is only a 0.01% chance that a "Model F-Value" this large could occur due to noise.

Values of "Prob > F" less than 0.0500 indicate model terms are significant.
In this case A, B, AB are significant model terms.
Values greater than 0.1000 indicate the model terms are not significant.
If there are many insignificant model terms (not counting those required to support hierarchy), model reduction may improve your model.

Std. Dev.	0.36	R-Squared	0.9980
Mean	40.81	Adj R-Squared	0.9972
C.V. %	0.89	Pred R-Squared	0.9954
PRESS	2.38	Adeq Precision	74.998

The "Pred R-Squared" of 0.9954 is in reasonable agreement with the "Adj R-Squared" of 0.9972.

"Adeq Precision" measures the signal to noise ratio. A ratio greater than 4 is desirable. Your ratio of 74.998 indicates an adequate signal. This model can be used to navigate the design space.

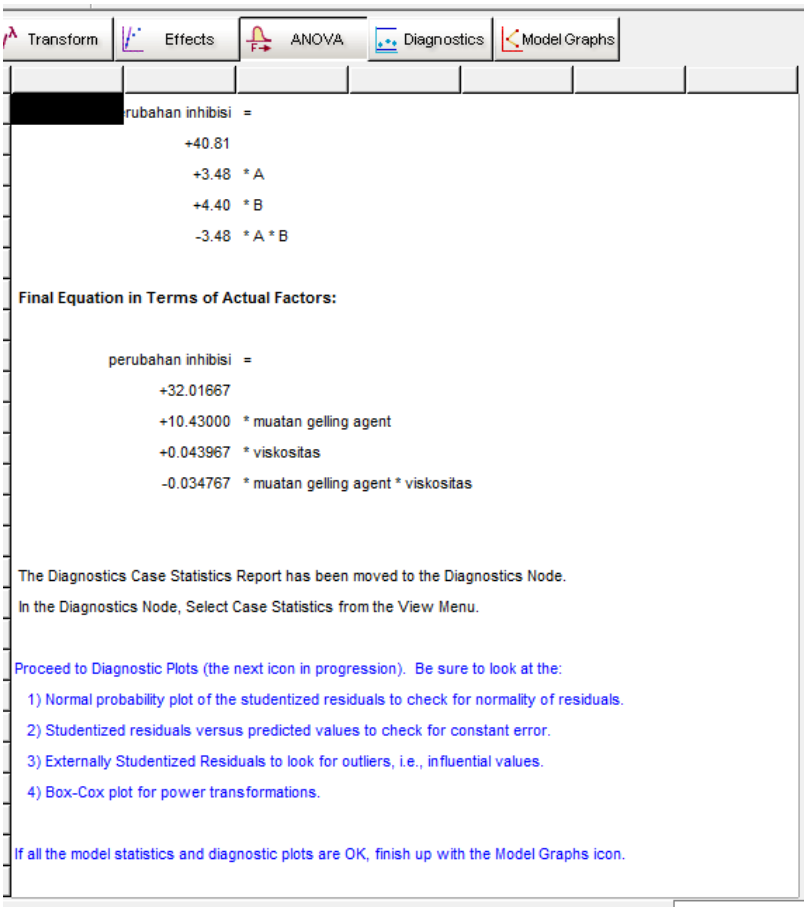
Factor	Coefficient Estimate	df	Standard Error	95% CI Low	95% CI High	VIF
Intercept	40.81	1	0.10	40.57	41.05	
A-muatan gelling	3.48	1	0.10	3.23	3.72	1.00
B-viskositas	4.40	1	0.10	4.15	4.64	1.00
AB	-3.48	1	0.10	-3.72	-3.23	1.00

Final Equation in Terms of Coded Factors:

perubahan inhibisi =
+40.81
+3.48 * A
+4.40 * B
-3.48 * A * B

Final Equation in Terms of Actual Factors:

perubahan inhibisi =
+32.01667
+10.43000 * muatan gelling agent
+0.043967 * viskositas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Effects
ANOVA
Diagnostics
Model Graphs
rubahan inhibisi =
+40.81
+3.48 * A
+4.40 * B
-3.48 * A * B
Final Equation in Terms of Actual Factors:
perubahan inhibisi =
+32.01667
+10.43000 * muatan gelling agent
+0.043967 * viskositas
-0.034767 * muatan gelling agent * viskositas
The Diagnostics Case Statistics Report has been moved to the Diagnostics Node.
In the Diagnostics Node, Select Case Statistics from the View Menu.
Proceed to Diagnostic Plots (the next icon in progression). Be sure to look at the:
1) Normal probability plot of the studentized residuals to check for normality of residuals.
2) Studentized residuals versus predicted values to check for constant error.
3) Externally Studentized Residuals to look for outliers, i.e., influential values.
4) Box-Cox plot for power transformations.
If all the model statistics and diagnostic plots are OK, finish up with the Model Graphs icon.

Lampiran 15. Hasil uji *desirability*

Constraints

Name	Goal	Lower Limit	Upper Limit	Lower Weight	Upper Weight	Importance
muatan gelling a	is in range	-1	1	1	1	3
viskositas	is in range	100	300	1	1	3
kumulatif	maximize	1.59	7.84	1	1	3
AUC total	maximize	95.8025	444.062	1	1	3
perubahan inhib	minimize	29	45.59	1	1	3
perubahan viskc	minimize	0	20	1	1	3

Solutions

Number	muatan gelling	viskositas	kumulatif	AUC total	perubahan inh	perubahan visl	Desirability	
1	0.47	100.00	6.96655	402.645	39.6877	11.9762	0.574	Selected
2	0.48	100.00	6.98471	403.471	39.7723	11.9098	0.573	
3	0.42	100.00	6.89619	399.441	39.3601	12.2332	0.573	
4	0.40	100.00	6.86198	397.883	39.2008	12.3582	0.573	