

## LAMPIRAN

### Lampiran 1. *Certificate of Analysis* Minyak Nilam

#### CERTIFICATE OF ANALYSIS

Indesso Aroma  
Jl. Alternatif Cibubur-Cileungsi KM 9  
Cileungsi 16820  
Phone: +62,21, 824 9108  
Fax : +62,21, 823 2632

Product Name:  
PATCHOULI OIL LIGHT 8683

CILEUNGSIBOGOR, 19 July 2018

Reference  
ORDER :  
LOT : 0000890241  
PRODUCTION DATE : 24,07,2018  
RETEST DATE : 23,07,2020

Sold to:

Characteristic	Specification	Results
Appearance	Viscous liquid	Slight viscous oily liquid
Colour	Yellow to Brown	Yellowish brown
Organoleptic	Woody, Sweet, Balsamic, Herbac Earthy Floral	Conform to Standard
Acid Value (Titration)	Max, 8,0 mg KOH/G	6,3
Iron Content (Spectrofotometer)	Max, 5,0 ppm	3,10
Refractive Index at 20 °C	1,507 - 1,512	1,508
Specific Gravity at 25 °C	0,950 - 0,970	0,958
Pogostol Content (GLC)	1 - 5 %	2,5
Sum of Patchouli Alcohol	Min, 30,0 %	30,89

Issued by:  
QC Manager

This computer generated Certificate of Analysis is valid without signature

Additional Product Information :  
FLASH POINT : > 83 °C

Storage condition:  
Store in tightly closed containers with minimum headspace in a cool, dark and dry place.

*This Certificate of Analysis does not relieve the purchaser from undertaking their own tests in order to assure the suitability of this product for its application and to comply with all relevant legal requirement for any goods into which this product is incorporated*

## Lampiran 2. Uji Regresi Linier Karakteristik Fisik Mikroemulsi Minyak Nilam

### 1. Uji Regresi Linier Viskositas Mikroemulsi Minyak Nilam

**Model Summary<sup>b</sup>**

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.808 <sup>a</sup>	.653	.305	1,29006

- a. Predictors: (Constant), Formulasi  
b. Dependent Variable: Viskositas

**ANOVA<sup>b</sup>**

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	3.125	1	3.125	1.878	.401 <sup>a</sup>
	Residual	1.664	1	1.664		
	Total	4.789	2			

- a. Predictors: (Constant), Formulasi  
b. Dependent Variable: Viskositas

**Coefficients<sup>a</sup>**

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	5.447	1.971		2.764	.221
	Formulasi	-1.250	.912	-.808	-1.370	.401

- a. Dependent Variable: Viskositas

### 2. Uji Regresi Linier pH Mikroemulsi Minyak Nilam

**Model Summary<sup>b</sup>**

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.992 <sup>a</sup>	.984	.968	.01633

- a. Predictors: (Constant), Formulasi  
b. Dependent Variable: pH

**ANOVA<sup>b</sup>**

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	.016	1	.016	60.750	.081 <sup>a</sup>
	Residual	.000	1	.000		
	Total	.016	2			

- a. Predictors: (Constant), Formulasi  
b. Dependent Variable: pH

**Coefficients<sup>a</sup>**

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	8.097	.025		324.589	.002
	Formulasi	-.090	.012	-.992	-7.794	.081

- a. Dependent Variable: pH

### Lampiran 3. Uji Statistik Stabilitas Fisik Mikroemulsi Minyak Nilam

#### 1. Formula I

##### a. Viskositas

Siklus	Kolmogorov-Smirnov <sup>a</sup>			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
Viskositas	Siklus 0	.219	3	.987	3	.780
	Siklus 1	.253	3	.964	3	.637
	Siklus 2	.385	3	.750	3	.000
	Siklus 3	.314	3	.893	3	.363

a. Lilliefors Significance Correction

#### Test of Homogeneity of Variances

Viskositas

Levene Statistic	df1	df2	Sig.
1.986	3	8	.195

#### Test Statistics<sup>a,b</sup>

	Viskositas
Chi-Square	9.804
df	3
Asymp. Sig.	.020

a. Kruskal Wallis Test

#### Ranks

Siklus	N	Mean Rank	Sum of Ranks
Viskositas Siklus 0	3	5.00	15.00
Siklus 1	3	2.00	6.00
Total	6		

#### Ranks

Siklus	N	Mean Rank	Sum of Ranks
Viskositas Siklus 0	3	5.00	15.00
Siklus 2	3	2.00	6.00
Total	6		

#### Test Statistics<sup>b</sup>

	Viskositas
Mann-Whitney U	.000
Wilcoxon W	6.000
Z	-1.964
Asymp. Sig. (2-tailed)	.040
Exact Sig. [2*(1-tailed Sig.)]	.100 <sup>a</sup>

#### Test Statistics<sup>b</sup>

	Viskositas
Mann-Whitney U	.000
Wilcoxon W	6.000
Z	-1.993
Asymp. Sig. (2-tailed)	.046
Exact Sig. [2*(1-tailed Sig.)]	.100 <sup>a</sup>

#### Ranks

Siklus	N	Mean Rank	Sum of Ranks
Viskositas Siklus 0	3	5.00	15.00
Siklus 3	3	2.00	6.00
Total	6		

#### Test Statistics<sup>b</sup>

	Viskositas
Mann-Whitney U	.000
Wilcoxon W	6.000
Z	-1.964
Asymp. Sig. (2-tailed)	.040
Exact Sig. [2*(1-tailed Sig.)]	.100 <sup>a</sup>

### Lampiran 3. Lanjutan.....

#### b. pH

##### Tests of Normality

Siklus	Kolmogorov-Smirnov <sup>a</sup>			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
pH Siklus 0	.253	3	.	.964	3	.637
Siklus 1	.207	3	.	.992	3	.831
Siklus 2	.191	3	.	.997	3	.900
Siklus 3	.253	3	.	.964	3	.637

a. Lilliefors Significance Correction

##### Test of Homogeneity of Variances

pH			
Levene Statistic	df1	df2	Sig.
1.726	3	8	.239

##### ANOVA

pH					
	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	1.666	3	.555	42.111	.000
Within Groups	.105	8	.013		
Total	1.771	11			

##### Multiple Comparisons

pH  
LSD

(I) Siklus	(J) Siklus	Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval	
					Lower Bound	Upper Bound
Siklus 0	Siklus 1	-.29000 <sup>*</sup>	.09375	.015	-.5062	-.0738
	Siklus 2	-.49667 <sup>*</sup>	.09375	.001	-.7129	-.2805
	Siklus 3	-1.02000 <sup>*</sup>	.09375	.000	-1.2362	-.8038

### Lampiran 3. Lanjutan.....

#### 2. Formula II

##### a. Viskositas

Tests of Normality

Siklus	Kolmogorov-Smirnov <sup>a</sup>			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
Viskositas Siklus 0	.175	3	.	1.000	3	1.000
Siklus 1	.253	3	.	.964	3	.637
Siklus 2	.253	3	.	.964	3	.637
Siklus 3	.385	3	.	.750	3	.000

a. Lilliefors Significance Correction

Test of Homogeneity of Variances

Viskositas

Levene Statistic	df1	df2	Sig.
.162	3	8	.919

Test Statistics<sup>a,b</sup>

	Viskositas
Chi-Square	9.769
df	3
Asymp. Sig.	.021

a. Kruskal Wallis Test

b. Grouping Variable: Siklus

Ranks

Siklus	N	Mean Rank	Sum of Ranks
Viskositas Siklus 0	3	4.33	13.00
Siklus 1	3	2.67	8.00
Total	6		

Ranks

Siklus	N	Mean Rank	Sum of Ranks
Viskositas Siklus 0	3	5.00	15.00
Siklus 2	3	2.00	6.00
Total	6		

Test Statistics<sup>b</sup>

	Viskositas
Mann-Whitney U	2.000
Wilcoxon W	8.000
Z	-1.124
Asymp. Sig. (2-tailed)	.266
Exact Sig. [2*(1-tailed Sig.)]	.400 <sup>a</sup>

Test Statistics<sup>b</sup>

	Viskositas
Mann-Whitney U	.000
Wilcoxon W	6.000
Z	-1.964
Asymp. Sig. (2-tailed)	.040
Exact Sig. [2*(1-tailed Sig.)]	.100 <sup>a</sup>

Ranks

Siklus	N	Mean Rank	Sum of Ranks
Viskositas Siklus 0	3	5.00	15.00
Siklus 3	3	2.00	6.00
Total	6		

Test Statistics<sup>b</sup>

	Viskositas
Mann-Whitney U	.000
Wilcoxon W	6.000
Z	-1.993
Asymp. Sig. (2-tailed)	.046
Exact Sig. [2*(1-tailed Sig.)]	.100 <sup>a</sup>

### Lampiran 3. Lanjutan.....

#### b. pH

Tests of Normality<sup>a</sup>

Siklus	Kolmogorov-Smirnov <sup>a</sup>			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
pH Siklus 1	.314	3	.	.893	3	.363
Siklus 2	.385	3	.	.750	3	.000
Siklus 3	.314	3	.	.893	3	.363

a. Lilliefors Significance Correction

b. pH is constant when Siklus = Siklus 0. It has been omitted.

Test of Homogeneity of Variances

pH			
Levene Statistic	df1	df2	Sig.
5.434	3	8	.025

Test Statistics<sup>a,b</sup>

pH	
Chi-Square	10.152
df	3
Asymp. Sig.	.017

a. Kruskal Wallis Test

Ranks

Siklus	N	Mean Rank	Sum of Ranks
pH Siklus 0	3	2.00	6.00
Siklus 1	3	5.00	15.00
Total	6		

Ranks

Siklus	N	Mean Rank	Sum of Ranks
pH Siklus 0	3	2.00	6.00
Siklus 2	3	5.00	15.00
Total	6		

Test Statistics<sup>a</sup>

pH	
Mann-Whitney U	.000
Wilcoxon W	6.000
Z	-2.087
Asymp. Sig. (2-tailed)	.037
Exact Sig. [2*(1-tailed Sig.)]	.100 <sup>a</sup>

Test Statistics<sup>a</sup>

pH	
Mann-Whitney U	.000
Wilcoxon W	6.000
Z	-2.121
Asymp. Sig. (2-tailed)	.034
Exact Sig. [2*(1-tailed Sig.)]	.100 <sup>a</sup>

Ranks

Siklus	N	Mean Rank	Sum of Ranks
pH Siklus 0	3	2.00	6.00
Siklus 3	3	5.00	15.00
Total	6		

Test Statistics<sup>a</sup>

pH	
Mann-Whitney U	.000
Wilcoxon W	6.000
Z	-2.087
Asymp. Sig. (2-tailed)	.037
Exact Sig. [2*(1-tailed Sig.)]	.100 <sup>a</sup>

### Lampiran 3. Lanjutan.....

#### 3. Formula III

##### a. Viskositas

Tests of Normality							
Siklus		Kolmogorov-Smirnov <sup>a</sup>			Shapiro-Wilk		
		Statistic	df	Sig.	Statistic	df	Sig.
Viskositas	Siklus 0	.385	3	.	.750	3	.000
	Siklus 1	.253	3	.	.964	3	.637
	Siklus 2	.253	3	.	.964	3	.637
	Siklus 3	.385	3	.	.750	3	.000

a. Lilliefors Significance Correction

#### Test of Homogeneity of Variances

Viskositas

Levene Statistic	df1	df2	Sig.
.157	3	8	.922

#### Test Statistics<sup>a,b</sup>

Viskositas	
Chi-Square	3.301
df	3
Asymp. Sig.	.347

a. Kruskal Wallis Test

##### b. pH

Tests of Normality							
Siklus		Kolmogorov-Smirnov <sup>a</sup>			Shapiro-Wilk		
		Statistic	df	Sig.	Statistic	df	Sig.
pH	Siklus 0	.385	3	.	.750	3	.000
	Siklus 1	.309	3	.	.900	3	.387
	Siklus 2	.292	3	.	.923	3	.463
	Siklus 3	.385	3	.	.750	3	.000

a. Lilliefors Significance Correction

#### Test of Homogeneity of Variances

pH

Levene Statistic	df1	df2	Sig.
9.287	3	8	.006

#### Test Statistics<sup>a,b</sup>

pH	
Chi-Square	4.880
df	3
Asymp. Sig.	.181

a. Kruskal Wallis Test

**Lampiran 4. Perhitungan % Aktivitas Antioksidan Mikroemulsi Minyak Nilam**

$$\% \text{ Aktivitas Antioksidan} = \frac{(\text{Serapan blanko} - \text{Serapan sampel})}{\text{Serapan blanko}} \times 100\%$$

**Absorbansi Blanko : 0,637**

Formula 1

Siklus 0

$$1. \% \text{ Aktivitas Antioksidan} = \frac{0,637 - 0,119}{0,637} \times 100 \% = 45,02 \%$$

$$2. \% \text{ Aktivitas Antioksidan} = \frac{0,637 - 0,113}{0,637} \times 100 \% = 45,96 \%$$

$$3. \% \text{ Aktivitas Antioksidan} = \frac{0,637 - 0,115}{0,637} \times 100 \% = 45,65 \%$$

$$4. \% \text{ Aktivitas Antioksidan} = \frac{0,637 - 0,111}{0,637} \times 100 \% = 46,27 \%$$

Rata-rata % Aktivitas Antioksidan Siklus 0 : 45,73 %





## Lampiran 5. Uji Statistika % Aktivitas Antioksidan Mikroemulsi Minyak Nilam

### 1. Formula I

#### Tests of Normality

Siklus	Kolmogorov-Smirnov <sup>a</sup>			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
% Inhibisi Siklus 0	.194	4	.	.970	4	.842
Siklus 1	.375	4	.	.817	4	.135
Siklus 2	.212	4	.	.964	4	.806
Siklus 3	.191	4	.	.970	4	.844

a. Lilliefors Significance Correction

#### Test of Homogeneity of Variances

% Inhibisi

Levene Statistic	df1	df2	Sig.
.294	3	12	.829

#### ANOVA

% Inhibisi	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	500.986	3	166.995	618.105	.000
Within Groups	3.242	12	.270		
Total	504.228	15			

#### Multiple Comparisons

% Inhibisi  
LSD

(I) Siklus	(J) Siklus	Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval	
					Lower Bound	Upper Bound
Siklus 0	Siklus 1	9.22250 <sup>*</sup>	.36754	.000	8.4217	10.0233
	Siklus 2	10.87000 <sup>*</sup>	.36754	.000	10.0692	11.6708
	Siklus 3	15.38500 <sup>*</sup>	.36754	.000	14.5842	16.1858

## Lampiran 5. Lanjutan.....

### 2. Formula II

#### Tests of Normality

Siklus	Kolmogorov-Smirnov <sup>a</sup>			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
% Inhibisi Siklus 0	.269	4	.	.877	4	.325
Siklus 1	.218	4	.	.960	4	.778
Siklus 2	.195	4	.	.967	4	.822
Siklus 3	.153	4	.	.992	4	.967

a. Lilliefors Significance Correction

#### Test of Homogeneity of Variances

% Inhibisi

Levene Statistic	df1	df2	Sig.
22.181	3	12	.000

#### Test Statistics<sup>a,b</sup>

	% Inhibisi
Chi-Square	14.118
df	3
Asymp. Sig.	.003

a. Kruskal Wallis Test

#### Mann-Whitney Test

##### Ranks

Siklus	N	Mean Rank	Sum of Ranks
% Inhibisi Siklus 0	4	6.50	26.00
Siklus 1	4	2.50	10.00
Total	8		

#### Test Statistics<sup>b</sup>

	% Inhibisi
Mann-Whitney U	.000
Wilcoxon W	10.000
Z	-2.309
Asymp. Sig. (2-tailed)	.021
Exact Sig. [2*(1-tailed Sig.)]	.029 <sup>a</sup>

a. Not corrected for ties

#### Mann-Whitney Test

##### Ranks

Siklus	N	Mean Rank	Sum of Ranks
% Inhibisi Siklus 0	4	6.50	26.00
Siklus 2	4	2.50	10.00
Total	8		

#### Test Statistics<sup>b</sup>

	% Inhibisi
Mann-Whitney U	.000
Wilcoxon W	10.000
Z	-2.309
Asymp. Sig. (2-tailed)	.021
Exact Sig. [2*(1-tailed Sig.)]	.029 <sup>a</sup>

#### Mann-Whitney Test

##### Ranks

Siklus	N	Mean Rank	Sum of Ranks
% Inhibisi Siklus 0	4	6.50	26.00
Siklus 3	4	2.50	10.00
Total	8		

#### Test Statistics<sup>b</sup>

	% Inhibisi
Mann-Whitney U	.000
Wilcoxon W	10.000
Z	-2.309
Asymp. Sig. (2-tailed)	.021
Exact Sig. [2*(1-tailed Sig.)]	.029 <sup>a</sup>

## Lampiran 5. Lanjutan.....

### 1. Formula III

#### Tests of Normality

Siklus	Kolmogorov-Smirnov <sup>a</sup>			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
% Inhibisi Siklus 0	.228	4	.	.944	4	.676
Siklus 1	.304	4	.	.808	4	.117
Siklus 2	.234	4	.	.913	4	.499
Siklus 3	.224	4	.	.977	4	.886

a. Lilliefors Significance Correction

#### Test of Homogeneity of Variances

% Inhibisi

Levene Statistic	df1	df2	Sig.
1.466	3	12	.273

#### ANOVA

% Inhibisi

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	206.081	3	68.694	176.374	.000
Within Groups	4.674	12	.389		
Total	210.754	15			

% Inhibisi  
LSD

(I) Siklus	(J) Siklus	Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval	
					Lower Bound	Upper Bound
Siklus 0	Siklus 1	3.96500 <sup>*</sup>	.44129	.000	3.0035	4.9265
	Siklus 2	7.06250 <sup>*</sup>	.44129	.000	6.1010	8.0240
	Siklus 3	9.61500 <sup>*</sup>	.44129	.000	8.6535	10.5765

## Lampiran 6. Stabilitas Fisik Mikroemulsi Minyak Nilam

### 1. Formula I

Sikus	Repli -kasi	Pengujian					
		Warna	Bentuk	Bau	Homogenitas	pH	Viskositas (dPa-s)
0	1	Kuning Pucat Jernih	Kental	Khas Aromatik	Homogen	6,98	1,40
	2	Kuning Pucat Jernih	Kental	Khas Aromatik	Homogen	7,00	1,60
	3	Kuning Pucat Jernih	Kental	Khas Aromatik	Homogen	7,01	1,48
1	1	Kuning Pucat Jernih	Kental	Khas Aromatik	Homogen	7,15	1,20
	2	Kuning Pucat Jernih	Kental	Khas Aromatik	Homogen	7,30	1,35
	3	Kuning Pucat Jernih	Kental	Khas Aromatik	Homogen	7,41	1,30
2	1	Kuning Pucat Jernih	Kental	Khas Aromatik	Homogen	7,50	1,10
	2	Kuning Pucat Jernih	Kental	Khas Aromatik	Homogen	7,38	1,10
	3	Kuning Pucat Jernih	Kental	Khas Aromatik	Homogen	7,60	1,05
3	1	Kuning Pucat Jernih	Kental	Khas Aromatik	Homogen	8,15	0,90
	2	Kuning Pucat Jernih	Kental	Khas Aromatik	Homogen	7,85	1,10
	3	Kuning Pucat Jernih	Kental	Khas Aromatik	Homogen	8,05	1,00

## Lampiran 6. Lanjutan.....

## 2. Formula II

Sikus	Repli -kasi	Pengujian					
		Warna	Bentuk	Bau	Homogenitas	pH	Viskositas (dPa-s)
0	1	Kuning Jernih	Kental	Khas Aromatik	Homogen	6,93	1,60
	2	Kuning Jernih	Kental	Khas Aromatik	Homogen	6,93	1,80
	3	Kuning Jernih	Kental	Khas Aromatik	Homogen	6,93	1,70
1	1	Kuning Jernih	Kental	Khas Aromatik	Homogen	7,25	1,55
	2	Kuning Jernih	Kental	Khas Aromatik	Homogen	7,00	1,70
	3	Kuning Jernih	Kental	Khas Aromatik	Homogen	7,20	1,60
2	1	Kuning Jernih	Kental	Khas Aromatik	Homogen	7,45	1,20
	2	Kuning Jernih	Kental	Khas Aromatik	Homogen	7,45	1,35
	3	Kuning Jernih	Kental	Khas Aromatik	Homogen	7,54	1,25
3	1	Kuning Jernih	Kental	Khas Aromatik	Homogen	7,50	1,00
	2	Kuning Jernih	Kental	Khas Aromatik	Homogen	7,75	1,10
	3	Kuning Jernih	Kental	Khas Aromatik	Homogen	7,55	1,10

## Lampiran 6. Lanjutan.....

## 3. Formula III

Sikus	Repli -kasi	Pengujian					
		Warna	Bentuk	Bau	Homogenitas	pH	Viskositas (dPa-s)
0	1	Kuning Pekat Jernih	Kental	Khas Aromatik	Homogen	6,83	1,90
	2	Kuning Pekat Jernih	Kental	Khas Aromatik	Homogen	6,82	1,80
	3	Kuning Pekat Jernih	Kental	Khas Aromatik	Homogen	6,82	1,80
1	1	Kuning Pekat Jernih	Kental	Khas Aromatik	Homogen	6,65	1,90
	2	Kuning Pekat Jernih	Kental	Khas Aromatik	Homogen	6,98	1,75
	3	Kuning Pekat Jernih	Kental	Khas Aromatik	Homogen	6,91	1,80
2	1	Kuning Pekat Jernih	Kental	Khas Aromatik	Homogen	6,85	1,85
	2	Kuning Pekat Jernih	Kental	Khas Aromatik	Homogen	6,88	1,70
	3	Kuning Pekat Jernih	Kental	Khas Aromatik	Homogen	6,89	1,80
3	1	Kuning Pekat Jernih	Kental	Khas Aromatik	Homogen	6,68	1,80
	2	Kuning Pekat Jernih	Kental	Khas Aromatik	Homogen	6,72	1,70
	3	Kuning Pekat Jernih	Kental	Khas Aromatik	Homogen	6,68	1,70