

**BAB V**  
**KESIMPULAN DAN SARAN**

**A. Kesimpulan**

Dari hasil penelitian sediaan Micellar Water dengan variasi konsentrasi Tween 80 :

1. Minyak Biji Wortel dengan variasi konsentrasi Tween 80 dapat dibuat sediaan Micellar Water.
2. Micellar based water dengan variasi konsentrasi surfaktan tween 80 2% menghasilkan warna yang jernih.

**B. Saran**

1. Perlu dilakukan penelitian lebih lanjut terhadap pengaruh jenis surfaktan yang lain.
2. Perlu dilakukan penelitian lebih lanjut mengenai perbandingan variasi konsentrasi surfaktan berapakah yang baik.

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## Lampiran 1. Sertifikat Analisis Minyak Biji Wortel ( Carrot Seed Oil ).



**NEW DIRECTIONS**  
A R O M A T I C S

### CERTIFICATE OF ANALYSIS

Product: Carrot Seed Essential Oil - Steam  
 Lot No.: 11021 - A26-1, B26-1, C26-1, D26-1, E26-1, F26-1  
 Best Before: December, 2019  
 Store in an air tight container; in a cool dry area; away from direct sunlight.

Properties	Specifications	Results
Appearance:	Pale yellow to brownish yellow liquid.	Complies
Odor:	The odor is light, sweet, fresh & warm reminiscent of carrot.	Complies
Solubility:	Insoluble in water.	Complies
Specific Gravity:	0.9200 - 0.960 @ 20°C	0.951
Refractive Index:	1.490 - 1.510 @ 20°C	1.4947
Optical Rotation:	+10° to +30°	+18.19°

#### Disclaimer & Caution:

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## Lampiran 2. Perhitungan Viskositas Sediaan Micellar Water

Viskositas sediaan Micellar Water diukur dengan persamaan sebagai berikut :

$$\text{Viskositas} = \frac{\text{density sampel} \times \text{waktu sampel} \times \eta \text{ aquadest}}{\text{density pembanding} \times \text{waktu pembanding}} = \dots \text{cps}$$

Data hasil pengukuran :

Pembanding	= aquadest
$\eta$ aquadest	= 0,86 cp
d aquadest	= 0,996 gr/ml
d sampel	= 0,9556 gr/ml
waktu pembanding	= 4,72

waktu sampel

Minggu 0

F1	F2	F3
5,30	5,32	5,35
5,29	5,33	5,35
5,30	5,33	5,35

Minggu 1

F1	F2	F3
5,33	5,44	5,44
5,33	5,44	5,40
5,30	5,45	5,40

Minggu 2

F1	F2	F3
5,64	5,61	5,58
5,60	5,60	5,60
5,62	5,62	5,60

Minggu 3

F1	F2	F3
5,78	5,66	5,71
5,78	5,66	5,72
5,79	5,68	5,71

Minggu 4

F1	F2	F3
5,80	5,78	5,78
5,82	5,78	5,78
5,80	5,79	5,80

Minggu 0

Formula 1

$$\text{Viskositas I} = \frac{\text{density sampel} \times \text{waktu sampel} \times \eta \text{ aquadest}}{\text{density pembanding} \times \text{waktu pembanding}} = \dots \text{cps}$$

$$\begin{aligned} \text{Viskositas I} &= \frac{0,9556 \times 5,30 \times 0,86}{0,996 \times 4,72} \\ &= 0,93 \text{ cps} \end{aligned}$$

$$\text{Viskositas II} = \frac{\text{density sampel} \times \text{waktu sampel} \times \eta \text{ aquadest}}{\text{density pembanding} \times \text{waktu pembanding}} = \dots \text{cps}$$

$$\begin{aligned} \text{Viskositas II} &= \frac{0,9556 \times 5,29 \times 0,86}{0,996 \times 4,72} \\ &= 0,92 \text{ cps} \end{aligned}$$

$$\text{Viscositas III} = \frac{\text{density sampel} \times \text{waktu sampel} \times \eta \text{ aquadest}}{\text{density pembanding} \times \text{waktu pembanding}}$$

$$\begin{aligned} \text{Viscositas} &= \frac{0,9556 \times 5,30 \times 0,86}{0,996 \times 4,72} \\ &= 0,93 \text{ cps} \end{aligned}$$

Formula II

$$\text{Viscositas I} = \frac{\text{density sampel} \times \text{waktu sampel} \times \eta \text{ aquadest}}{\text{density pembanding} \times \text{waktu pembanding}}$$

$$\begin{aligned} \text{Viscositas} &= \frac{0,9556 \times 5,32 \times 0,86}{0,996 \times 4,72} \\ &= 0,93 \text{ cps} \end{aligned}$$

$$\text{Viscositas II} = \frac{\text{density sampel} \times \text{waktu sampel} \times \eta \text{ aquadest}}{\text{density pembanding} \times \text{waktu pembanding}}$$

$$\begin{aligned} \text{Viscositas} &= \frac{0,9556 \times 5,33 \times 0,86}{0,996 \times 4,72} \\ &= 0,93 \text{ cps} \end{aligned}$$

$$\text{Viscositas III} = \frac{\text{density sampel} \times \text{waktu sampel} \times \eta \text{ aquadest}}{\text{density pembanding} \times \text{waktu pembanding}}$$

$$\begin{aligned} \text{Viscositas} &= \frac{0,9556 \times 5,33 \times 0,86}{0,996 \times 4,72} \\ &= 0,93 \text{ cps} \end{aligned}$$

Formula III

$$\text{Viscositas I} = \frac{\text{density sampel} \times \text{waktu sampel} \times \eta \text{ aquadest}}{\text{density pembanding} \times \text{waktu pembanding}}$$

$$\text{Viscositas} = \frac{0,9556 \times 5,35 \times 0,86}{0,996 \times 4,72}$$

$$= 0,93 \text{ cps}$$

$$\text{Viscositas II} = \frac{\text{density sampel} \times \text{waktu sampel} \times \eta \text{ aquadest}}{\text{density pembanding} \times \text{waktu pembanding}}$$

$$\text{Viscositas} = \frac{0,9556 \times 5,35 \times 0,86}{0,996 \times 4,72}$$

$$= 0,93 \text{ cps}$$

$$\text{Viscositas III} = \frac{\text{density sampel} \times \text{waktu sampel} \times \eta \text{ aquadest}}{\text{density pembanding} \times \text{waktu pembanding}}$$

$$\text{Viscositas} = \frac{0,9556 \times 5,35 \times 0,86}{0,996 \times 4,72}$$

$$= 0,93 \text{ cps}$$

Minggu 1

Formula I

$$\text{Viscositas I} = \frac{\text{density sampel} \times \text{waktu sampel} \times \eta \text{ aquadest}}{\text{density pembanding} \times \text{waktu pembanding}}$$

$$\text{Viscositas} = \frac{0,9556 \times 5,33 \times 0,86}{0,996 \times 4,72}$$

$$= 0,93 \text{ cps}$$

$$\text{Viscositas II} = \frac{\text{density sampel} \times \text{waktu sampel} \times \eta \text{ aquadest}}{\text{density pembanding} \times \text{waktu pembanding}}$$

$$\text{Viscositas} = \frac{0,9556 \times 5,33 \times 0,86}{0,996 \times 4,72}$$

$$= 0,93 \text{ cps}$$

$$\text{Viscositas III} = \frac{\text{density sampel} \times \text{waktu sampel} \times \eta \text{ aquadest}}{\text{density pembanding} \times \text{waktu pembanding}}$$

$$\text{Viscositas} = \frac{0,9556 \times 5,30 \times 0,86}{0,996 \times 4,72}$$

$$= 0,93 \text{ cps}$$

Formula II

$$\text{Viscositas I} = \frac{\text{density sampel} \times \text{waktu sampel} \times \eta \text{ aquadest}}{\text{density pembanding} \times \text{waktu pembanding}}$$

$$\begin{aligned} \text{Viscositas} &= \frac{0,9556 \times 5,44 \times 0,86}{0,996 \times 4,72} \\ &= 0,95 \text{ cps} \end{aligned}$$

$$\text{Viscositas II} = \frac{\text{density sampel} \times \text{waktu sampel} \times \eta \text{ aquadest}}{\text{density pembanding} \times \text{waktu pembanding}}$$

$$\begin{aligned} \text{Viscositas} &= \frac{0,9556 \times 5,44 \times 0,86}{0,996 \times 4,72} \\ &= 0,95 \text{ cps} \end{aligned}$$

$$\text{Viscositas III} = \frac{\text{density sampel} \times \text{waktu sampel} \times \eta \text{ aquadest}}{\text{density pembanding} \times \text{waktu pembanding}}$$

$$\begin{aligned} \text{Viscositas} &= \frac{0,9556 \times 5,45 \times 0,86}{0,996 \times 4,72} \\ &= 0,95 \text{ cps} \end{aligned}$$

Formula III

$$\text{Viscositas I} = \frac{\text{density sampel} \times \text{waktu sampel} \times \eta \text{ aquadest}}{\text{density pembanding} \times \text{waktu pembanding}}$$

$$\begin{aligned} \text{Viscositas} &= \frac{0,9556 \times 5,44 \times 0,86}{0,996 \times 4,72} \\ &= 0,95 \text{ cps} \end{aligned}$$

$$\text{Viscositas II} = \frac{\text{density sampel} \times \text{waktu sampel} \times \eta \text{ aquadest}}{\text{density pembanding} \times \text{waktu pembanding}}$$

$$\begin{aligned} \text{Viscositas} &= \frac{0,9556 \times 5,40 \times 0,86}{0,996 \times 4,72} \\ &= 0,94 \text{ cps} \end{aligned}$$

$$\text{Viscositas III} = \frac{\text{density sampel} \times \text{waktu sampel} \times \eta \text{ aquadest}}{\text{density pembanding} \times \text{waktu pembanding}}$$

$$\begin{aligned} \text{Viscositas} &= \frac{0,9556 \times 5,40 \times 0,86}{0,996 \times 4,72} \\ &= 0,94 \text{ cps} \end{aligned}$$

Minggu 2

Formula I

$$\text{Viscositas I} = \frac{\text{density sampel} \times \text{waktu sampel} \times \eta \text{ aquadest}}{\text{density pembanding} \times \text{waktu pembanding}}$$

$$\begin{aligned} \text{Viscositas} &= \frac{0,9556 \times 5,64 \times 0,86}{0,996 \times 4,72} \\ &= 0,98 \text{ cps} \end{aligned}$$



$$\text{Viscositas II} = \frac{\text{density sampel} \times \text{waktu sampel} \times \eta \text{ aquadest}}{\text{density pembanding} \times \text{waktu pembanding}}$$

$$\text{Viscositas} = \frac{0,9556 \times 5,60 \times 0,86}{0,996 \times 4,72}$$

$$= 0,98 \text{ cps}$$

$$\text{Viscositas III} = \frac{\text{density sampel} \times \text{waktu sampel} \times \eta \text{ aquadest}}{\text{density pembanding} \times \text{waktu pembanding}}$$

$$\text{Viscositas} = \frac{0,9556 \times 5,62 \times 0,86}{0,996 \times 4,72}$$

$$= 0,98 \text{ cps}$$

Formula II

$$\text{Viscositas I} = \frac{\text{density sampel} \times \text{waktu sampel} \times \eta \text{ aquadest}}{\text{density pembanding} \times \text{waktu pembanding}}$$

$$\text{Viscositas} = \frac{0,9556 \times 5,61 \times 0,86}{0,996 \times 4,72}$$

$$= 0,98 \text{ cps}$$

$$\text{Viscositas II} = \frac{\text{density sampel} \times \text{waktu sampel} \times \eta \text{ aquadest}}{\text{density pembanding} \times \text{waktu pembanding}}$$

$$\text{Viscositas} = \frac{0,9556 \times 5,60 \times 0,86}{0,996 \times 4,72}$$

$$= 0,98 \text{ cps}$$

$$\text{Viscositas III} = \frac{\text{density sampel} \times \text{waktu sampel} \times \eta \text{ aquadest}}{\text{density pembanding} \times \text{waktu pembanding}}$$

$$\text{Viscositas} = \frac{0,9556 \times 5,62 \times 0,86}{0,996 \times 4,72}$$

$$= 0,98 \text{ cps}$$

Formula III

$$\text{Viscositas I} = \frac{\text{density sampel} \times \text{waktu sampel} \times \eta \text{ aquadest}}{\text{density pembanding} \times \text{waktu pembanding}}$$

$$\text{Viscositas} = \frac{0,9556 \times 5,58 \times 0,86}{0,996 \times 4,72}$$

$$= 0,97 \text{ cps}$$

$$\text{Viscositas II} = \frac{\text{density sampel} \times \text{waktu sampel} \times \eta \text{ aquadest}}{\text{density pembanding} \times \text{waktu pembanding}}$$

$$\text{Viscositas} = \frac{0,9556 \times 5,60 \times 0,86}{0,996 \times 4,72}$$

$$= 0,98 \text{ cps}$$

$$\text{Viscositas III} = \frac{\text{density sampel} \times \text{waktu sampel} \times \eta \text{ aquadest}}{\text{density pembanding} \times \text{waktu pembanding}}$$

$$\begin{aligned} \text{Viscositas} &= \frac{0,9556 \times 5,60 \times 0,86}{0,996 \times 4,72} \\ &= 0,98 \text{ cps} \end{aligned}$$

Minggu 3

Formula 1

$$\text{Viscositas I} = \frac{\text{density sampel} \times \text{waktu sampel} \times \eta \text{ aquadest}}{\text{density pembanding} \times \text{waktu pembanding}}$$

$$\begin{aligned} \text{Viscositas} &= \frac{0,9556 \times 5,78 \times 0,86}{0,996 \times 4,72} \\ &= 1,01 \text{ cps} \end{aligned}$$

$$\text{Viscositas II} = \frac{\text{density sampel} \times \text{waktu sampel} \times \eta \text{ aquadest}}{\text{density pembanding} \times \text{waktu pembanding}}$$

$$\begin{aligned} \text{Viscositas} &= \frac{0,9556 \times 5,78 \times 0,86}{0,996 \times 4,72} \\ &= 1,01 \text{ cps} \end{aligned}$$

$$\text{Viscositas III} = \frac{\text{density sampel} \times \text{waktu sampel} \times \eta \text{ aquadest}}{\text{density pembanding} \times \text{waktu pembanding}}$$

$$\begin{aligned} \text{Viscositas} &= \frac{0,9556 \times 5,79 \times 0,86}{0,996 \times 4,72} \\ &= 1,01 \text{ cps} \end{aligned}$$

Formula II

$$\text{Viscositas I} = \frac{\text{density sampel} \times \text{waktu sampel} \times \eta \text{ aquadest}}{\text{density pembanding} \times \text{waktu pembanding}}$$

$$\begin{aligned} \text{Viscositas} &= \frac{0,9556 \times 5,66 \times 0,86}{0,996 \times 4,72} \\ &= 0,99 \text{ cps} \end{aligned}$$

$$\text{Viscositas II} = \frac{\text{density sampel} \times \text{waktu sampel} \times \eta \text{ aquadest}}{\text{density pembanding} \times \text{waktu pembanding}}$$

$$\begin{aligned} \text{Viscositas} &= \frac{0,9556 \times 5,66 \times 0,86}{0,996 \times 4,72} \\ &= 0,99 \text{ cps} \end{aligned}$$

$$\text{Viscositas III} = \frac{\text{density sampel} \times \text{waktu sampel} \times \eta \text{ aquadest}}{\text{density pembanding} \times \text{waktu pembanding}}$$

$$\begin{aligned} \text{Viscositas} &= \frac{0,9556 \times 5,68 \times 0,86}{0,996 \times 4,72} \\ &= 0,99 \text{ cps} \end{aligned}$$

Formula III

$$\text{Viscositas I} = \frac{\text{density sampel} \times \text{waktu sampel} \times \eta \text{ aquadest}}{\text{density pembanding} \times \text{waktu pembanding}}$$

$$\text{Viscositas} = \frac{0,9556 \times 5,71 \times 0,86}{0,996 \times 4,72}$$

$$= 0,99 \text{ cps}$$

$$\text{Viscositas II} = \frac{\text{density sampel} \times \text{waktu sampel} \times \eta \text{ aquadest}}{\text{density pembanding} \times \text{waktu pembanding}}$$

$$\text{Viscositas} = \frac{0,9556 \times 5,72 \times 0,86}{0,996 \times 4,72}$$

$$= 0,99 \text{ cps}$$

$$\text{Viscositas III} = \frac{\text{density sampel} \times \text{waktu sampel} \times \eta \text{ aquadest}}{\text{density pembanding} \times \text{waktu pembanding}}$$

$$\text{Viscositas} = \frac{0,9556 \times 5,71 \times 0,86}{0,996 \times 4,72}$$

$$= 0,99 \text{ cps}$$

Minggu 4

Formula 1

$$\text{Viscositas I} = \frac{\text{density sampel} \times \text{waktu sampel} \times \eta \text{ aquadest}}{\text{density pembanding} \times \text{waktu pembanding}}$$

$$\text{Viscositas} = \frac{0,9556 \times 5,80 \times 0,86}{0,996 \times 4,72}$$

$$= 1,01 \text{ cps}$$

$$\text{Viscositas II} = \frac{\text{density sampel} \times \text{waktu sampel} \times \eta \text{ aquadest}}{\text{density pembanding} \times \text{waktu pembanding}}$$

$$\text{Viscositas} = \frac{0,9556 \times 5,82 \times 0,86}{0,996 \times 4,72}$$

$$= 1,01 \text{ cps}$$

$$\text{Viscositas III} = \frac{\text{density sampel} \times \text{waktu sampel} \times \eta \text{ aquadest}}{\text{density pembanding} \times \text{waktu pembanding}}$$

$$\text{Viscositas} = \frac{0,9556 \times 5,80 \times 0,86}{0,996 \times 4,72}$$

$$= 1,01 \text{ cps}$$

Formula II

$$\text{Viscositas I} = \frac{\text{density sampel} \times \text{waktu sampel} \times \eta \text{ aquadest}}{\text{density pembanding} \times \text{waktu pembanding}}$$

$$\text{Viscositas} = \frac{0,9556 \times 5,78 \times 0,86}{0,996 \times 4,72}$$

$$= 1,01 \text{ cps}$$

Viscositas II =  $\frac{\text{density sampel} \times \text{waktu sampel} \times \eta \text{ aquadest}}{\text{density pembanding} \times \text{waktu pembanding}}$

Viscositas =  $\frac{0,9556 \times 5,78 \times 0,86}{0,996 \times 4,72}$

$$= 1,01 \text{ cps}$$

Viscositas III =  $\frac{\text{density sampel} \times \text{waktu sampel} \times \eta \text{ aquadest}}{\text{density pembanding} \times \text{waktu pembanding}}$

Viscositas =  $\frac{0,9556 \times 5,79 \times 0,86}{0,996 \times 4,72}$

$$= 1,01 \text{ cps}$$

Formula III

Viscositas I =  $\frac{\text{density sampel} \times \text{waktu sampel} \times \eta \text{ aquadest}}{\text{density pembanding} \times \text{waktu pembanding}}$

Viscositas =  $\frac{0,9556 \times 5,78 \times 0,86}{0,996 \times 4,72}$

$$= 1,01 \text{ cps}$$

Viscositas II =  $\frac{\text{density sampel} \times \text{waktu sampel} \times \eta \text{ aquadest}}{\text{density pembanding} \times \text{waktu pembanding}}$

Viscositas =  $\frac{0,9556 \times 5,78 \times 0,86}{0,996 \times 4,72}$

$$= 1,01 \text{ cps}$$

Viscositas III =  $\frac{\text{density sampel} \times \text{waktu sampel} \times \eta \text{ aquadest}}{\text{density pembanding} \times \text{waktu pembanding}}$

Viscositas =  $\frac{0,9556 \times 5,80 \times 0,86}{0,996 \times 4,72}$

$$= 1,01 \text{ cps}$$

### Standardevisi

Minggu 0	Minggu 1	Minggu 2
F1=0	F1=0,0057735	F1=0,0057735
F2=0	F2=1,3597	F2=0,0057735
F3=0	F3=0,005774	F3=1,36
Minggu 3	Minggu 4	
F1=0	F1=0	
F2=0,0057735	F2=0	
F3=1,36	F3=0	

### Lampiran 3. Alat dan Hasil Perngujian



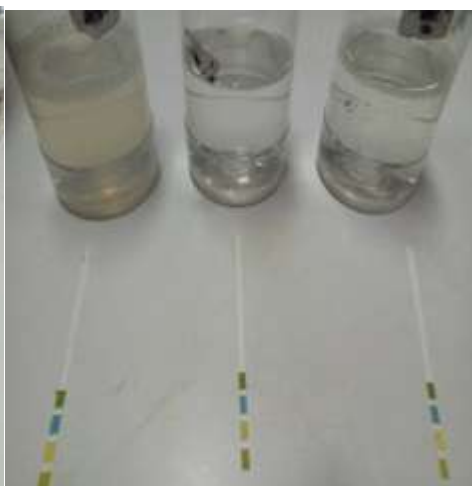
Minggu ke-0



Minggu ke-1



Minggu ke-2



Minggu ke-3



Minggu ke-5



hasil uji pH



Pipet ukur yang digunakan uji viskositas

#### Lampiran 4. Hasil uji statistik formulasi Micellar Water minyak biji wortel

##### One-Sample Kolmogorov-Smirnov Test

		Viskositas
N		15
Normal Parameters <sup>a,b</sup>	Mean	.9693
	Std. Deviation	.03348
	Absolute	.158
Most Extreme Differences	Positive	.147
	Negative	-.158
Kolmogorov-Smirnov Z		.613
Asymp. Sig. (2-tailed)		.846

a. Test distribution is Normal.

b. Calculated from data.

Data output menunjukkan bahwa nilai sig. dari uji *kolmogorov-Smirnov* diatas  $>0,05$  ( $H_0$  diterima) maka dapat disimpulkan bahwa data tersebut terdistribusi normal sehingga dapat dilanjutkan dengan uji *One Way ANOVA*.

##### Test of Homogeneity of Variances

Viskositas

Levene Statistic	df1	df2	Sig.
.853	2	12	.450

Nilai probabilitas dari output diatas adalah sig. =  $0,450 > 0,05$  maka  $H_0$  diterima sehingga dapat dilanjutkan dengan uji *post hoc*

## ANOVA

Viskositas

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	.000	2	.000	.005	.995
Within Groups	.016	12	.001		
Total	.016	14			

Dari data output uji ANOVA diatas diketahui nilai sig = 0,995 > 0,05 (H0 diterima) maka dapat disimpulkan bahwa tidak ada perbedaan yang signifikan pada formulasi.

### Post Hoc Tests

#### Homogeneous Subsets

##### Viskositas

Student-Newman-Keuls<sup>a</sup>

Formula	N	Subset for alpha = 0.05
		1
Formula III	5	.9680
Formula I	5	.9700
Formula II	5	.9700
Sig.		.996



Means for groups in homogeneous subsets are displayed.

a. Uses Harmonic Mean Sample Size = 5,000.

Dari data output diatas menunjukkan bahwa tidak terdapat adanya perbedaan signifikan pada setiap kelompok formulasi.