

## Lampiran 1. Hasil Determinasi Tanaman Sirsak (*Annona muricata* L.)



KEMENTERIAN RISET, TEKNOLOGI DAN PENDIDIKAN TINGGI  
**UNIVERSITAS DIPONEGORO**  
**FAKULTAS SAINS DAN MATEMATIKA**  
 LABORATORIUM EKOLOGI DAN BIOSISTEMATIKA DEPARTEMEN BIOLOGI  
 Jl. Prof. H. Soedarto SH Tembalang Semarang, 024 7474754. 024 76480923

### HASIL DETERMINASI / IDENTIFIKASI

#### KLASIFIKASI

Kingdom : Plantae (Tumbuhan)  
 Subkingdom : Tracheobionta (Tumbuhan berpembuluh)  
 Super Divisi : Spermatophyta (Menghasilkan biji)  
 Divisi : Magnoliophyta (Tumbuhan berbunga)  
 Kelas : Magnoliopsida (berkeping dua / dikotil)  
 Sub Kelas : -  
 Ordo : Magnoliales  
 Famili : Annonaceae  
 Genus : *Annona*  
 Spesies : *Annona muricata* L. (Sirsak).

#### DETERMINASI

1b, 2b, 3b, 4b, 6b, 7b, 9b, 10b, 11b, 12b, 13b, 14a, 15a.....  
 Golongan 8. Tanaman dengan daun tunggal dan tersebar. .... 109b, 119b, 120b,  
 128b, 129b, 135b, 136b, 139b, 140b, 142b, 143b, 146b, 154b, 155b, 156b, 162b, 163a,  
 164b, 165b, 166a, ..... Famili 50. Annonaceae .....  
 Genus 2. *Annona* ..... 1a Spesies : *Annona muricata* L. (Sirsak).

#### DESKRIPSI

Pohon, tinggi 3-8 m. Daun memanjang, bentuk lanset atau bulat telur terbalik, ujung meruncing pendek, seperti kulit, panjang 6-18 cm, tepi rata. Bunga berdiri sendiri berhadapan dengan daun, bau tidak enak. Daun kelopak bunga kecil. Daun mahkota bunga berdaging, tiga yang terluar hijau, kemudian kuning, panjang 3,5-5 cm, tiga yang terdalam bulat telur, kuning muda. Daun kelopak dan daun mahkota yang terluar pada saat kuncup seperti katup, sedangkan daun mahkota terdalam tersusun seperti susunan genting. Dasar bunga sangat cekung, benang sari banyak, bakal buah banyak, bakal biji satu. Buah majemuk tidak beraturan, bentuk telur miring atau bengkok, berduri tempel. Biji hitam, daging buah putih. Pohon buah dari Hindia Barat, banyak ditanam di Indonesia.

Tanaman ini ditanam secara komersial untuk diambil daging buahnya. Dapat tumbuh di sembarang tempat, paling baik ditanam di daerah yang cukup berair. Nama sirsak berasal dari bahasa Belanda Zuurzak yang berarti kantung yang asam. Pohon sirsak bisa mencapai tinggi 9 meter. Di Indonesia sirsak dapat tumbuh dengan baik pada ketinggian 1000 m dari permukaan laut.

## Lampiran 2. Surat Keterangan telah Melakukan Penelitian



### UNIVERSITAS WAHID HASYIM FAKULTAS FARMASI BAGIAN BIOLOGI FARMASI

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#### SURAT KETERANGAN

No.158/Lab.Biologi Farmasi/C.05/UWH/VIII/2018

Assalamu'alaikum Wr. Wb.

Yang bertandatangan di bawah ini, Kepala Bagian Biologi Farmasi Universitas Wahid Hasyim Semarang menerangkan bahwa:

Nama : Fathria Satriani Putri  
NIM : 145010084  
Fakultas : Farmasi

Telah melakukan pembuatan ekstrak daun sirsak dalam rangka penelitian dengan judul:  
“Pengaruh Variasi Konsentrasi Sukrosa Sebagai Pemanis Dalam Tablet *Effervescent* Daun Sirsak (*Annona muricata* L.) Terhadap Sifat Fisik dan Penerimaan Rasa.”

Demikian surat keterangan ini dibuat untuk dipergunakan semestinya.

Wassalamu'alaikum Wr. Wb.

Semarang, Agustus 2018

Kapalag Biologi Farmasi



Dewi Andini S. M., M.Farm., Apt.

**Lampiran 3. Hasil Uji Sifat Fisik Granul Tablet *Effervescent* Ekstrak Daun Sirsak**

a. Waktu Alir Granul (detik)

| Replikasi        | Kecepatan alir (gram/detik) |              |              |
|------------------|-----------------------------|--------------|--------------|
|                  | FI                          | FII          | FIII         |
| 1                | 33,11                       | 52,63        | 21,41        |
| 2                | 33,22                       | 59,28        | 21,92        |
| 3                | 43,29                       | 51,28        | 19,76        |
| <b>Rata-rata</b> | <b>36,54</b>                | <b>54,40</b> | <b>21,03</b> |
| <b>SD</b>        | <b>5,84</b>                 | <b>4,28</b>  | <b>1,13</b>  |

b. Sudut Diam (°)

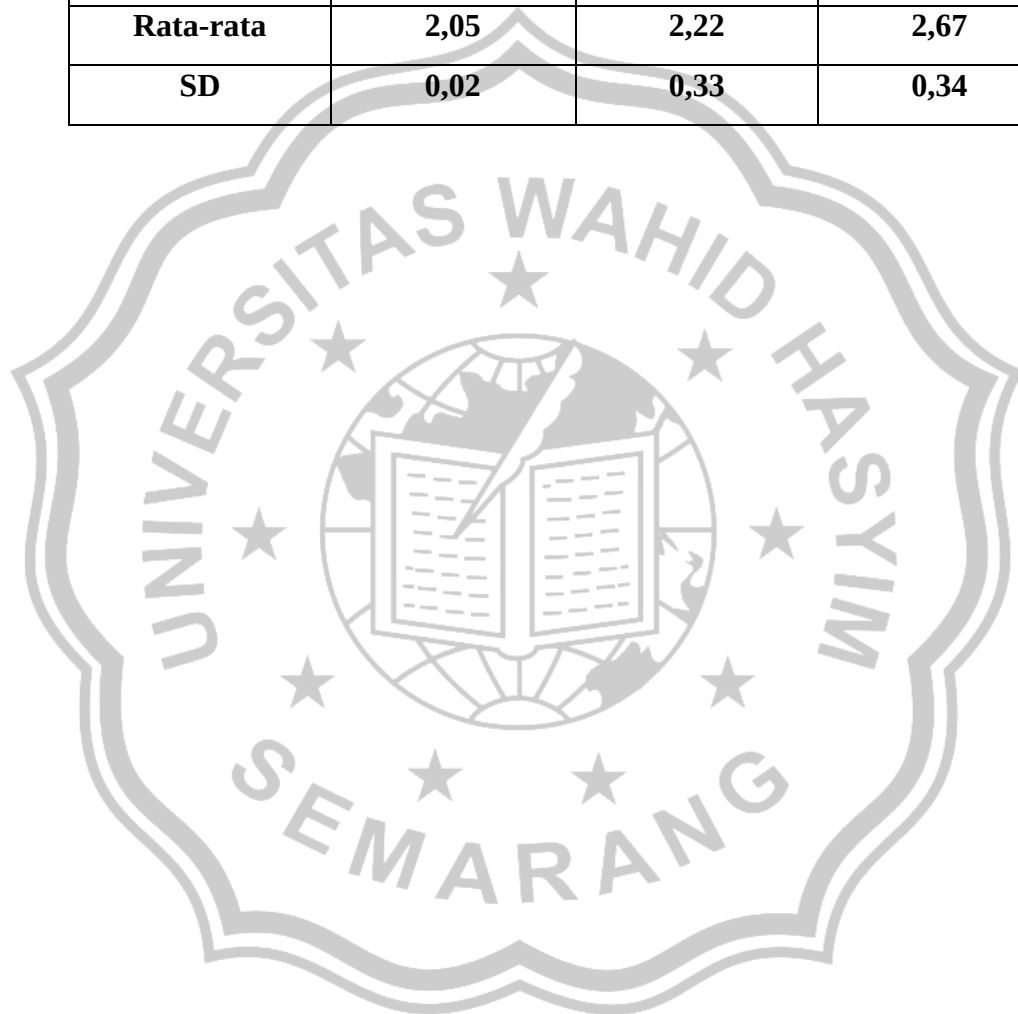
| Replikasi        | Sudut Diam (°) |              |              |
|------------------|----------------|--------------|--------------|
|                  | FI             | FII          | FIII         |
| 1                | 33,03          | 31,2         | 31,11        |
| 2                | 32,97          | 32,52        | 32,86        |
| 3                | 32,83          | 31,8         | 28,63        |
| <b>Rata-rata</b> | <b>32,94</b>   | <b>31,88</b> | <b>30,86</b> |
| <b>SD</b>        | <b>0,10</b>    | <b>0,61</b>  | <b>2,12</b>  |

c. Kompresibilitas (%)

| Replikasi        | Kompresibilitas (%) |              |              |
|------------------|---------------------|--------------|--------------|
|                  | FI                  | FII          | FIII         |
| 1                | 15                  | 12           | 10           |
| 2                | 16                  | 11           | 10           |
| 3                | 16                  | 11           | 12           |
| <b>Rata-rata</b> | <b>15,67</b>        | <b>11,33</b> | <b>10,67</b> |
| <b>SD</b>        | <b>0,57</b>         | <b>0,57</b>  | <b>1,15</b>  |

## d. Kadar Air

| Replikasi        | Kadar Air   |             |             |
|------------------|-------------|-------------|-------------|
|                  | FI          | FII         | FIII        |
| 1                | 2,03        | 2,19        | 2,28        |
| 2                | 2,05        | 2,56        | 2,80        |
| 3                | 2,08        | 1,91        | 2,93        |
| <b>Rata-rata</b> | <b>2,05</b> | <b>2,22</b> | <b>2,67</b> |
| <b>SD</b>        | <b>0,02</b> | <b>0,33</b> | <b>0,34</b> |



#### Lampiran 4. Hasil Uji Keseragaman Bobot Tablet *Effervescent*

##### a. Keseragaman Bobot

| Replikasi        | Keseragaman Bobot (gram) |              |              |
|------------------|--------------------------|--------------|--------------|
|                  | FI                       | FII          | FIII         |
| 1                | 3,035                    | 3,208        | 3,013        |
| 2                | 3,031                    | 3,077        | 3,115        |
| 3                | 3,029                    | 3,082        | 3,046        |
| 4                | 2,976                    | 3,06         | 3,064        |
| 5                | 3,073                    | 3,075        | 3,061        |
| 6                | 3,078                    | 3,018        | 3,088        |
| 7                | 2,980                    | 3,073        | 3,095        |
| 8                | 2,961                    | 3,074        | 3,092        |
| 9                | 3,054                    | 3,03         | 3,098        |
| 10               | 3,078                    | 3,071        | 3,096        |
| 11               | 3,074                    | 3,091        | 2,941        |
| 12               | 3,070                    | 3,041        | 3,015        |
| 13               | 3,068                    | 3,054        | 3,032        |
| 14               | 3,022                    | 2,978        | 3,061        |
| 15               | 2,967                    | 3,057        | 3,058        |
| 16               | 3,078                    | 3,044        | 3,072        |
| 17               | 2,984                    | 3,078        | 3,046        |
| 18               | 2,944                    | 3,053        | 3,052        |
| 19               | 3,032                    | 3,092        | 3,059        |
| 20               | 3,054                    | 3,111        | 3,036        |
| <b>Rata-rata</b> | <b>3,029</b>             | <b>3,068</b> | <b>3,057</b> |
| <b>SD</b>        | <b>0,045</b>             | <b>0,044</b> | <b>0,039</b> |
| <b>% CV</b>      | <b>1,485</b>             | <b>1,434</b> | <b>1,276</b> |

b. Perhitungan Keseragaman Bobot Tablet *Effervescent*

Formula I

$$\text{Bobot rata-rata 20 tablet} = 3,029 \text{ gram} = 3029 \text{ mg}$$

$$\text{Penyimpangan 5\%} = \frac{5}{100} \times 3029 \text{ mg} = 151,45 \text{ mg}$$

$$\begin{aligned} \text{Range penyimpangan} &= 3029 \text{ mg} \pm 151,45 \text{ mg} \\ &= (2877,55-3180,48) \text{ mg} \end{aligned}$$

$$\text{Bobot rata-rata 20 tablet} = 3,029 \text{ gram} = 3029 \text{ mg}$$

$$\text{Penyimpangan 10\%} = \frac{10}{100} \times 3029 \text{ mg} = 302,9 \text{ mg}$$

$$\begin{aligned} \text{Range penyimpangan} &= 3029 \text{ mg} \pm 302,9 \text{ mg} \\ &= (2726,1-3331,9) \text{ mg} \end{aligned}$$

Formula II

$$\text{Bobot rata-rata 20 tablet} = 3,068 \text{ gram} = 3068 \text{ mg}$$

$$\text{Penyimpangan 5\%} = \frac{5}{100} \times 3068 \text{ mg} = 153,4 \text{ mg}$$

$$\begin{aligned} \text{Range penyimpangan} &= 3068 \text{ mg} \pm 153,4 \text{ mg} \\ &= (2914,6-3221,4) \text{ mg} \end{aligned}$$

$$\text{Bobot rata-rata 20 tablet} = 3,068 \text{ gram} = 3068 \text{ mg}$$

$$\text{Penyimpangan 10\%} = \frac{10}{100} \times 3068 \text{ mg} = 306,8 \text{ mg}$$

$$\begin{aligned} \text{Range penyimpangan} &= 3068 \text{ mg} \pm 306,8 \text{ mg} \\ &= 2761,2-3374,8) \text{ mg} \end{aligned}$$

Formula III

$$\text{Bobot rata-rata 20 tablet} = 3,057 \text{ gram} = 3057 \text{ mg}$$

$$\text{Penyimpangan 5\%} = \frac{5}{100} \times 3057 \text{ mg} = 152,85 \text{ mg}$$

$$\begin{aligned} \text{Range penyimpangan} &= 3057 \text{ mg} \pm 152,85 \text{ mg} \\ &= (2904,15-3209,85) \text{ mg} \end{aligned}$$

$$\text{Bobot rata-rata 20 tablet} = 3,057 \text{ gram} = 3057 \text{ mg}$$

$$\text{Penyimpangan 10\%} = \frac{10}{100} \times 3057 \text{ mg} = 305,7 \text{ mg}$$

$$\begin{aligned} \text{Range penyimpangan} &= 3057 \text{ mg} \pm 305,7 \text{ mg} \\ &= (2751,3-3362,7) \text{ mg} \end{aligned}$$

**Lampiran 5. Hasil Uji Kekerasan Tablet *Effervescent***

| Replikasi        | Kekerasan (kg) |             |              |
|------------------|----------------|-------------|--------------|
|                  | FI             | FII         | FIII         |
| 1                | 7,97           | 9,21        | 11,67        |
| 2                | 5,25           | 9,2         | 10,37        |
| 3                | 6,88           | 9,13        | 10,24        |
| 4                | 7,41           | 8,78        | 9,91         |
| 5                | 8,97           | 9,78        | 10,8         |
| 6                | 7,95           | 9,93        | 10,1         |
| 7                | 9,19           | 9,78        | 12,67        |
| 8                | 7,59           | 9,27        | 10,24        |
| 9                | 7,48           | 9,59        | 9,77         |
| 10               | 7,54           | 9,31        | 9,65         |
| <b>Rata-rata</b> | <b>7,62</b>    | <b>9,40</b> | <b>10,54</b> |
| <b>SD</b>        | <b>1,09</b>    | <b>0,36</b> | <b>0,95</b>  |

### Lampiran 6. Hasil Uji Statistik Kekerasan Tablet *Effervescent*

Variables Entered/Removed<sup>b</sup>

| Model | Variables Entered                | Variables Removed | Method |
|-------|----------------------------------|-------------------|--------|
| 1     | Konsentrasi Sukrosa <sup>a</sup> | .                 | Enter  |

a. All requested variables entered.

b. Dependent Variable: Kekerasan

Model Summary

| Model | R                 | R Square | Adjusted R Square | Std. Error of the Estimate |
|-------|-------------------|----------|-------------------|----------------------------|
| 1     | .992 <sup>a</sup> | .984     | .968              | .26128                     |

a. Predictors: (Constant), Konsentrasi Sukrosa

ANOVA<sup>b</sup>

| Model |            | Sum of Squares | df | Mean Square | F      | Sig.              |
|-------|------------|----------------|----|-------------|--------|-------------------|
| 1     | Regression | 4.263          | 1  | 4.263       | 62.449 | .080 <sup>a</sup> |
|       | Residual   | .068           | 1  | .068        |        |                   |
|       | Total      | 4.331          | 2  |             |        |                   |

a. Predictors: (Constant), Konsentrasi Sukrosa

b. Dependent Variable: Kekerasan



### Lampiran 7. Hasil Uji Kerapuhan Tablet *Effervescent*

$$\text{Kerapuhan tablet} = \frac{W_o - W_a}{W_o} \times 100\%$$

| Replikasi        | Kerapuhan (%) |             |             |
|------------------|---------------|-------------|-------------|
|                  | FI            | FII         | FIII        |
| 1                | 0,42          | 0,51        | 0,58        |
| 2                | 0,52          | 0,61        | 0,10        |
| 3                | 0,18          | 0,39        | 1,11        |
| <b>Rata-rata</b> | <b>0,37</b>   | <b>0,50</b> | <b>0,60</b> |
| <b>SD</b>        | <b>0,17</b>   | <b>0,11</b> | <b>0,50</b> |

Formula I

1.  $W_o = 30,488 \text{ g}$

$W_a = 30,360 \text{ g}$

$$\text{Kerapuhan} = \frac{30,488 - 30,360}{30,488} \times 100\% \\ = 0,42\%$$

2.  $W_o = 30,479 \text{ g}$

$W_a = 30,320 \text{ g}$

$$\text{Kerapuhan} = \frac{30,479 - 30,320}{30,320} \times 100\% \\ = 0,52\%$$

3.  $W_o = 29,958 \text{ g}$

$W_a = 29,810 \text{ g}$

$$\text{Kerapuhan} = \frac{29,958 - 29,810}{29,958} \times 100\% \\ = 0,18\%$$

## Formula II

$$1. \quad W_o = 31,340 \text{ g}$$

$$W_a = 31,179 \text{ g}$$

$$\begin{aligned} \text{Kerapuhan} &= \frac{31,340 - 31,179}{31,340} \times 100\% \\ &= 0,51\% \end{aligned}$$

$$4. \quad W_o = 30,521 \text{ g}$$

$$W_a = 30,335 \text{ g}$$

$$\begin{aligned} \text{Kerapuhan} &= \frac{30,521 - 30,335}{30,521} \times 100\% \\ &= 0,61\% \end{aligned}$$

$$5. \quad W_o = 30,793 \text{ g}$$

$$W_a = 30,672 \text{ g}$$

$$\begin{aligned} \text{Kerapuhan} &= \frac{30,793 - 30,672}{30,793} \times 100\% \\ &= 0,39\% \end{aligned}$$

## Formula III

$$1. \quad W_o = 31,625 \text{ g}$$

$$W_a = 31,440 \text{ g}$$

$$\begin{aligned} \text{Kerapuhan} &= \frac{31,625 - 31,440}{31,625} \times 100\% \\ &= 0,58\% \end{aligned}$$

$$2. \quad W_o = 29,958 \text{ g}$$

$$W_a = 29,928 \text{ g}$$

$$\begin{aligned} \text{Kerapuhan} &= \frac{29,958 - 29,928}{29,958} \times 100\% \\ &= 0,10\% \end{aligned}$$

$$3. \quad W_o = 31,923 \text{ g}$$

$$W_a = 31,567 \text{ g}$$

$$\begin{aligned} \text{Kerapuhan} &= \frac{31,923 - 31,567}{31,923} \times 100\% \\ &= 1,11\% \end{aligned}$$

## Lampiran 8. Hasil Uji Statistik Kerapuhan Tablet *Effervescent*

**Variables Entered/Removed<sup>b</sup>**

| Model | Variables Entered                | Variables Removed | Method  |
|-------|----------------------------------|-------------------|---------|
| 1     | Konsentrasi Sukrosa <sup>a</sup> |                   | . Enter |

a. All requested variables entered.

b. Dependent Variable: Uji Kerapuhan

**Model Summary**

| Model | R                 | R Square | Adjusted R Square | Std. Error of the Estimate |
|-------|-------------------|----------|-------------------|----------------------------|
| 1     | .997 <sup>a</sup> | .994     | .989              | .01225                     |

a. Predictors: (Constant), Konsentrasi Sukrosa

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

| Model |            | Sum of Squares | df | Mean Square | F       | Sig.              |
|-------|------------|----------------|----|-------------|---------|-------------------|
| 1     | Regression | .026           | 1  | .026        | 176.333 | .048 <sup>a</sup> |
|       | Residual   | .000           | 1  | .000        |         |                   |
|       | Total      | .027           | 2  |             |         |                   |

a. Predictors: (Constant), Konsentrasi Sukrosa

b. Dependent Variable: Uji Kerapuhan

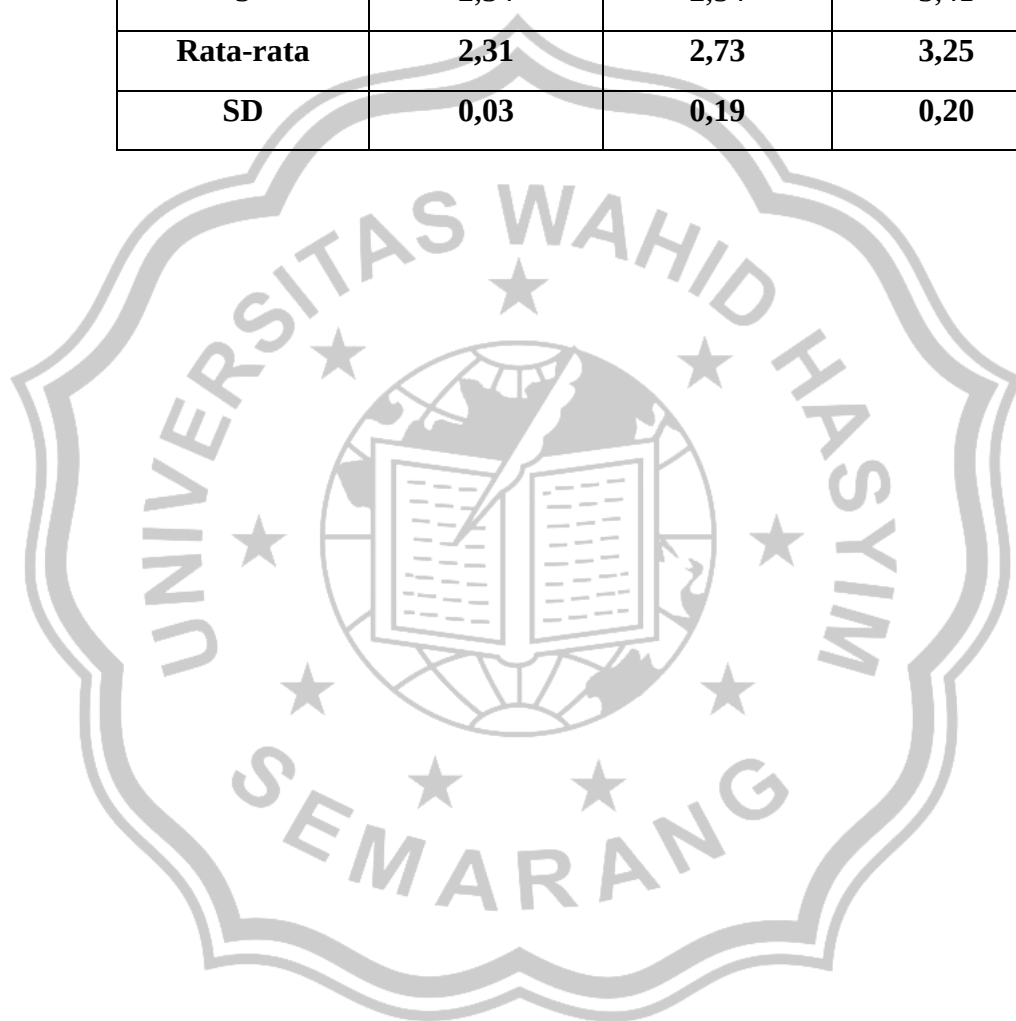
**Coefficients<sup>a</sup>**

| Model |                     | Unstandardized Coefficients |            | Standardized Coefficients | t      | Sig. |
|-------|---------------------|-----------------------------|------------|---------------------------|--------|------|
|       |                     | B                           | Std. Error | Beta                      |        |      |
| 1     | (Constant)          | .030                        | .035       |                           | .849   | .552 |
|       | Konsentrasi Sukrosa | .023                        | .002       | .997                      | 13.279 | .048 |

a. Dependent Variable: Uji Kerapuhan

**Lampiran 9. Hasil Uji Waktu Larut Tablet *Effervescent***

| Replikasi        | Waktu Larut (menit) |             |             |
|------------------|---------------------|-------------|-------------|
|                  | FI                  | FII         | FIII        |
| 1                | 2,31                | 2,93        | 3,30        |
| 2                | 2,28                | 2,73        | 3,03        |
| 3                | 2,34                | 2,54        | 3,41        |
| <b>Rata-rata</b> | <b>2,31</b>         | <b>2,73</b> | <b>3,25</b> |
| <b>SD</b>        | <b>0,03</b>         | <b>0,19</b> | <b>0,20</b> |



### Lampiran 10. Hasil Uji Statistik Waktu Larut Tablet *Effervescent*

Variables Entered/Removed<sup>b</sup>

| Model | Variables Entered                | Variables Removed | Method |
|-------|----------------------------------|-------------------|--------|
| 1     | Konsentrasi Sukrosa <sup>a</sup> | .                 | Enter  |

a. All requested variables entered.

b. Dependent Variable: Waktu Larut

Model Summary

| Model | R                 | R Square | Adjusted R Square | Std. Error of the Estimate |
|-------|-------------------|----------|-------------------|----------------------------|
| 1     | .998 <sup>a</sup> | .996     | .992              | .04082                     |

a. Predictors: (Constant), Konsentrasi Sukrosa

ANOVA<sup>b</sup>

| Model |            | Sum of Squares | df | Mean Square | F       | Sig.              |
|-------|------------|----------------|----|-------------|---------|-------------------|
| 1     | Regression | .442           | 1  | .442        | 265.080 | .039 <sup>a</sup> |
|       | Residual   | .002           | 1  | .002        |         |                   |
|       | Total      | .443           | 2  |             |         |                   |

a. Predictors: (Constant), Konsentrasi Sukrosa

b. Dependent Variable: Waktu Larut

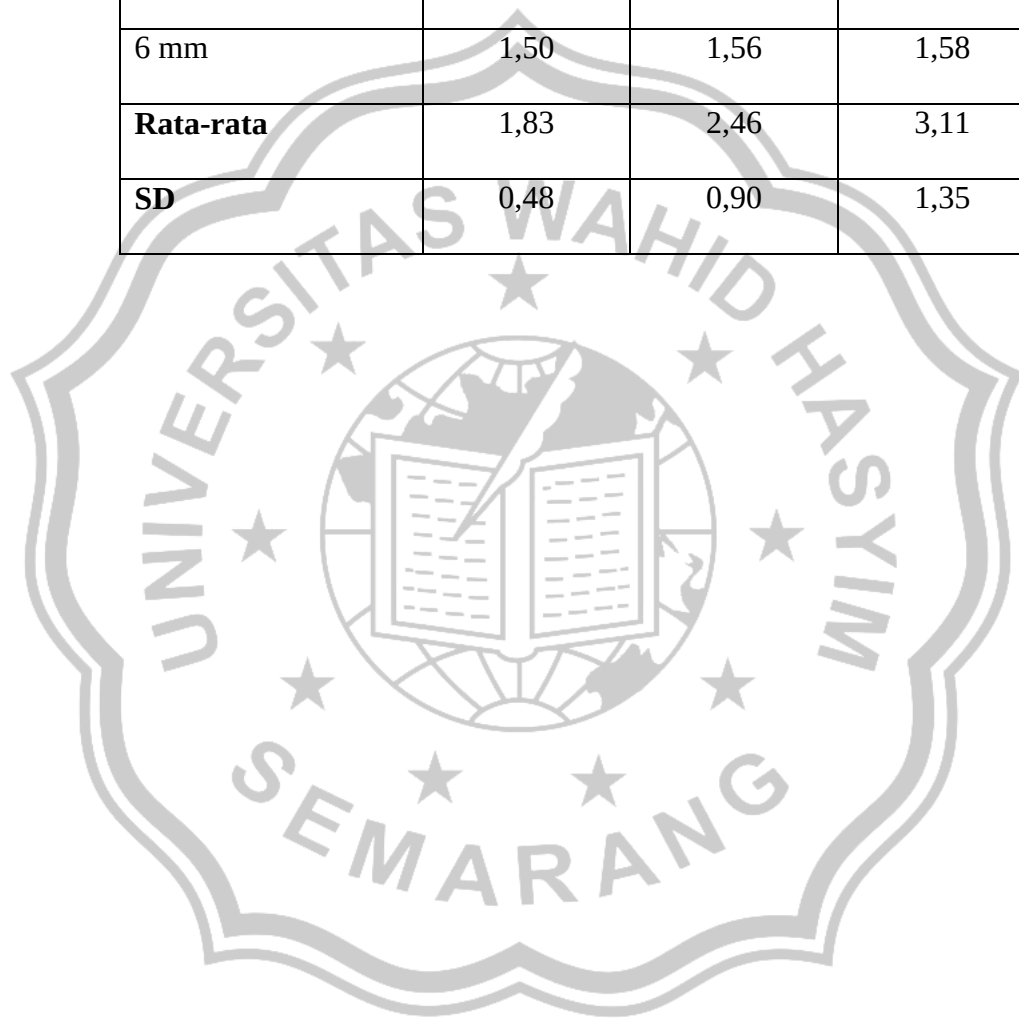
Coefficients<sup>a</sup>

| Model |                     | Unstandardized Coefficients |            | Standardized Coefficients | t      | Sig. |
|-------|---------------------|-----------------------------|------------|---------------------------|--------|------|
|       |                     | B                           | Std. Error | Beta                      |        |      |
| 1     | (Constant)          | .883                        | .118       |                           | 7.495  | .084 |
|       | Konsentrasi Sukrosa | .094                        | .006       | .998                      | 16.281 | .039 |

a. Dependent Variable: Waktu Larut

**Lampiran 11. Hasil Uji Kompaktibilitas**

| Skala            | Kekerasan (Kg) |      |      |
|------------------|----------------|------|------|
|                  | I              | II   | III  |
| 8 mm             | 2,39           | 3,37 | 4,13 |
| 7 mm             | 1,61           | 2,46 | 3,63 |
| 6 mm             | 1,50           | 1,56 | 1,58 |
| <b>Rata-rata</b> | 1,83           | 2,46 | 3,11 |
| <b>SD</b>        | 0,48           | 0,90 | 1,35 |

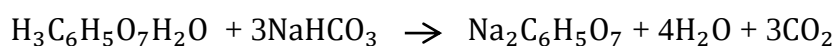


## Lampiran 12. Perhitungan Asam-Basa (Stoikiometri)

Perbandingan komponen asam-basa :

Asam sitrat : Asam tartrat : Natrium Bikarbonat  
1 : 2 : 3

(a.) Asam sitrat



(BM=84)

(BM=210)

↓  
(1 bagian asam sitrat) + (3 bagian natrium bikarbonat)

$$\text{Molaritas} = \frac{\text{gram}}{\text{BM}}$$

$$\frac{1 \text{ bagian}}{210} = \frac{X}{(3 \times 84)}$$

$$X = 1,2 \text{ gram (bagian asam sitrat)}$$

(b.) Asam tartrat



(BM=84)

(BM=150)

↓  
(2 bagian asam tartrat)

$$\text{Molaritas} = \frac{\text{gram}}{\text{BM}}$$

$$\frac{2}{150} = \frac{X}{(2 \times 84)}$$

$$X = 2,24 \text{ gram (bagian asam tartrat)}$$

(c.) Natrium Bikarbonat

$$\text{Bagian natrium bikarbonat} = 1,2 \text{ gram} + 2,24 \text{ gram} = 3,44 \text{ gram}$$

$$\begin{aligned} \text{Jumlah total} &= 1 \text{ bagian asam sitrat} + 2 \text{ bagian asam tartrat} + 3,4 \text{ bagian Na.Bik} \\ &= 6,4 \text{ bagian asam-basa} \end{aligned}$$

**Lampiran 13. Gambar Alat**

Timbangan analitik (Ohaus)



Moisture Balance HB43 Halogen



Oven (Inventum)



Granulator



Tablet Hardness Tester (YD-2)



Flowmeter GDT



## Lampiran 12. Lanjutan ...



Mesin tablet Single Punch



Freeze Drying



Friabilator Tester (Erweka)



Jangka sorong

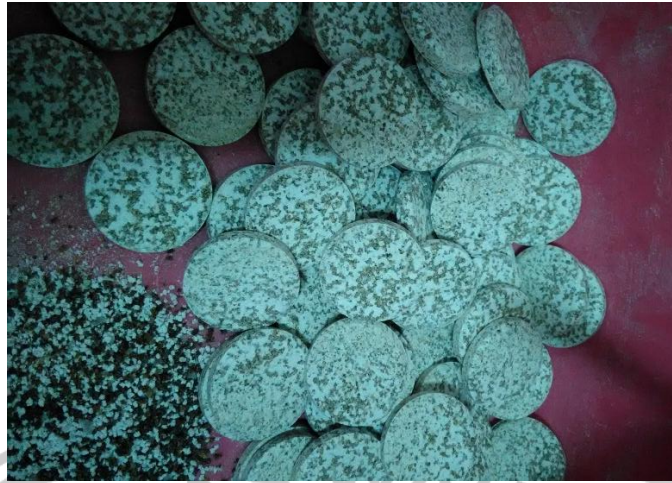


Tap Bulk Density Tester (Erweka)



Seperangkat alat infusa

**Lampiran 13. Gambar Tablet *Effervescent***



Tablet *effervescent*

