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# LAMPIRAN

Lampiran 1. Data Hasil Penelitian Jumlah Rendemen

| Konsentrasi NaOH | Ulangan 1 | Ulangan 2 | Ulangan 3 | Σ | x̄ |
|---|---|---|---|---|---|
| 0,1 M | 2,2 | 1,9 | 2,3 | 6,4 | 2,13 |
| 0,2 M | 3,2 | 2 | 4,8 | 10 | 3,33 |
| 0,3 M | 4,6 | 1,9 | 9,7 | 16,2 | 5,4 |

Lampiran 2. Perhitungan Jumlah Rendemen

$$\%Yield = \frac{\text{Ekstrak yang dihasilkan (g)}}{\text{Bahan baku yang digunakan (g)}} \times 100\%$$

- Konsentrasi NaOH 0,1 M ulangan 1 = $\frac{0,22}{10} \times 100 = 2,2\%$
- Konsentrasi NaOH 0,1 M ulangan 2 = $\frac{0,19}{10} \times 100 = 1,9\%$
- Konsentrasi NaOH 0,1 M ulangan 3 = $\frac{0,23}{10} \times 100 = 2,3\%$
- Konsentrasi NaOH 0,2 M ulangan 1 = $\frac{0,32}{10} \times 100 = 3,2\%$
- Konsentrasi NaOH 0,2 M ulangan 2 = $\frac{0,20}{10} \times 100 = 2,0\%$
- Konsentrasi NaOH 0,2 M ulangan 3 = $\frac{0,48}{10} \times 100 = 4,8\%$
- Konsentrasi NaOH 0,3 M ulangan 1 = $\frac{0,46}{10} \times 100 = 4,6\%$
- Konsentrasi NaOH 0,3 M ulangan 2 = $\frac{0,19}{10} \times 100 = 1,9\%$
- Konsentrasi NaOH 0,3 M ulangan 3 = $\frac{0,97}{10} \times 100 = 9,7\%$

Lampiran 3. Hasil Uji Statistik Jumlah Rendemen

**Descriptives**

| | | N | Mean | Std. Deviation | Std. Error | 95% Confidence Interval for Mean | | Minimum | Maximum |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | | Lower Bound | Upper Bound | | |
| rendemen | 0,1 | 3 | 2.133 | .2082 | .1202 | 1.616 | 2.650 | 1.9 | 2.3 |
| | 0,2 | 3 | 3.333 | 1.4048 | .8110 | -.156 | 6.823 | 2.0 | 4.8 |
| | 0.3 | 3 | 5.400 | 3.9611 | 2.2869 | -4.440 | 15.240 | 1.9 | 9.7 |
| | Total | 9 | 3.622 | 2.5445 | .8482 | 1.666 | 5.578 | 1.9 | 9.7 |
| antioksidan | 0,1 | 3 | 4.4838E2 | 79.678642 | 4.6002E1 | 250.45161 | 646.31705 | 357.910 | 508.095 |
| | 0,2 | 3 | 3.9259E2 | 278.372364 | 1.6071E2 | -298.92029 | 1084.11029 | 217.981 | 713.619 |
| | 0.3 | 3 | 8.0727E2 | 212.022283 | 1.2241E2 | 280.58178 | 1333.96688 | 641.176 | 1046.086 |
| | Total | 9 | 5.4941E2 | 264.919810 | 8.8306E1 | 345.78250 | 753.05328 | 217.981 | 1046.086 |
| totalgula | 0,1 | 3 | 1.1069E3 | 375.07340 | 2.1654E2 | 175.1994 | 2038.6673 | 780.00 | 1516.40 |
| | 0,2 | 3 | 1.3133E3 | 901.77224 | 5.2063E2 | -926.7931 | 3553.4598 | 288.00 | 1983.20 |
| | 0.3 | 3 | 6.9740E2 | 296.15354 | 1.7098E2 | -38.2862 | 1433.0862 | 357.60 | 900.60 |
| | Total | 9 | 1.0392E3 | 578.01954 | 1.9267E2 | 594.9171 | 1483.5274 | 288.00 | 1983.20 |
| totalfenolik | 0,1 | 3 | 2.7526E1 | 1.580630 | .912577 | 23.59950 | 31.45250 | 25.711 | 28.600 |
| | 0,2 | 3 | 4.6526E1 | 6.465891 | 3.733084 | 30.46384 | 62.58816 | 40.711 | 53.489 |
| | 0.3 | 3 | 1.2970E1 | .420812 | .242956 | 11.92531 | 14.01602 | 12.489 | 13.267 |
| | Total | 9 | 2.9007E1 | 14.949016 | 4.983005 | 17.51672 | 40.49839 | 12.489 | 53.489 |
| sulfat | 0,1 | 3 | 6.7600 | 3.70340 | 2.13816 | -2.4398 | 15.9598 | 3.32 | 10.68 |
| | 0,2 | 3 | 91.6133 | 30.86055 | 17.81734 | 14.9515 | 168.2752 | 64.28 | 125.08 |
| | 0.3 | 3 | 18.8133 | 7.17031 | 4.13978 | 1.0013 | 36.6254 | 14.28 | 27.08 |
| | Total | 9 | 39.0622 | 42.83721 | 14.27907 | 6.1346 | 71.9898 | 3.32 | 125.08 |

**ANOVA**

| | | Sum of Squares | df | Mean Square | F | Sig. |
|---|---|---|---|---|---|---|
| rendemen | Between Groups | 16.382 | 2 | 8.191 | 1.388 | .320 |
| | Within Groups | 35.413 | 6 | 5.902 | | |
| | Total | 51.796 | 8 | | | |
| antioksidan | Between Groups | 303874.755 | 2 | 151937.378 | 3.539 | .097 |
| | Within Groups | 257586.367 | 6 | 42931.061 | | |
| | Total | 561461.122 | 8 | | | |
| totalgula | Between Groups | 589692.382 | 2 | 294846.191 | .849 | .473 |
| | Within Groups | 2083160.293 | 6 | 347193.382 | | |
| | Total | 2672852.676 | 8 | | | |
| totalfenolik | Between Groups | 1698.818 | 2 | 849.409 | 57.285 | .000 |
| | Within Groups | 88.966 | 6 | 14.828 | | |
| | Total | 1787.785 | 8 | | | |
| sulfat | Between Groups | 12645.211 | 2 | 6322.606 | 18.642 | .003 |
| | Within Groups | 2035.004 | 6 | 339.167 | | |
| | Total | 14680.215 | 8 | | | |

Lampiran 4. Data Hasil Penelitian Total Gula

| Perlakuan | Total Gula µg/ml | Rata-rata |
|---|---|---|
| 0,1 M | 780.0 | 1.106,93 |
| | 1024.4 | |
| | 1516.4 | |
| 0,2 M | 288.0 | 1.313,33 |
| | 1668.8 | |
| | 1983.2 | |
| 0,3 M | 357.6 | 697,4 |
| | 834.0 | |
| | 900.6 | |

Lampiran 5. Perhitungan Total Gula

Y = 0,0063x + 0,0883

FP = 20

Konsentrasi NaOH 0,1 M ulangan 1

$$0{,}334 = 0{,}0063x + 0{,}0883$$
$$0{,}334 - 0{,}0883 = 0{,}0063x$$
$$0{,}2457 = 0{,}0063x$$
$$x = \frac{0{,}2457}{0{,}0063}$$
$$x = 39 \times 20 = 780\ \mu g/ml$$

Konsentrasi NaOH 0,1 M ulangan 2

$$0{,}411 = 0{,}0063x + 0{,}0883$$
$$0{,}411 - 0{,}0883 = 0{,}0063x$$
$$0{,}3227 = 0{,}0063x$$
$$x = \frac{0{,}3227}{0{,}0063}$$

$$x = 51,22 \times 20 = 1.024,4\ \mu g/ml$$

Konsentrasi NaOH 0,1 M ulangan 3

$$0,566 = 0,0063x + 0,0883$$
$$0,566 - 0,0883 = 0,0063x$$
$$0,4777 = 0,0063x$$
$$x = \frac{0,4777}{0,0063}$$
$$x = 75,82 \times 20 = 1.516,4\ \mu g/ml$$

Rata-rata = $\frac{780+1.024,4+1.516,4}{3} = 1.106,93\ \mu g/ml$

Konsentrasi NaOH 0,2 M ulangan 1

$$0,179 = 0,0063x + 0,0883$$
$$0,179 - 0,0883 = 0,0063x$$
$$0,0907 = 0,0063x$$
$$x = \frac{0,0907}{0,0063}$$
$$x = 14,40 \times 20 = 288\ \mu g/ml$$

Konsentrasi NaOH 0,2 M ulangan 2

$$0,614 = 0,0063x + 0,0883$$
$$0,614 - 0,0883 = 0,0063x$$
$$0,5257 = 0,0063x$$
$$x = \frac{0,5257}{0,0063}$$
$$x = 83,44 \times 20 = 1.668,8\ \mu g/ml$$

Konsentrasi NaOH 0,2 M ulangan 3

$$0,713 = 0,0063x + 0,0883$$
$$0,713 - 0,0883 = 0,0063x$$
$$0,6247 = 0,0063x$$
$$x = \frac{0,6247}{0,0063}$$
$$x = 99,16 \times 20 = 1.983,2\ \mu g/ml$$

Rata-rata = $\frac{288+1.668,8+1.983,2}{3} = 1.313,33\ \mu g/ml$

Konsentrasi NaOH 0,3 M ulangan 1

$$0,201 = 0,0063x + 0,0883$$
$$0,201 - 0,0883 = 0,0063x$$
$$0,1127 = 0,0063x$$
$$x = \frac{0,1127}{0,0063}$$
$$x = 17,88 \times 20 = 357,6\ \mu g/ml$$

Konsentrasi NaOH 0,3 M ulangan 2

$$0,351 = 0,0063x + 0,0883$$
$$0,351 - 0,0883 = 0,0063x$$

$$0{,}2627 = 0{,}0063x$$

$$x = \frac{0{,}2627}{0{,}0063}$$

$$x = 41{,}70 \times 20 = 834\ \mu g/ml$$

Konsentrasi NaOH 0,3 M ulangan 3

$$0{,}372 = 0{,}0063x + 0{,}0883$$

$$0{,}372 - 0{,}0883 = 0{,}0063x$$

$$0{,}2837 = 0{,}0063x$$

$$x = \frac{0{,}2837}{0{,}0063}$$

$$x = 45{,}03 \times 20 = 900{,}6\ \mu g/ml$$

Rata-rata = $\frac{357{,}6+834+900{,}6}{3} = 697{,}4\ \mu g/ml$

Lampiran 6. Hasil Uji Statistik Total Gula

**Descriptives**

| | | N | Mean | Std. Deviation | Std. Error | 95% Confidence Interval for Mean | | Minimum | Maximum |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | | Lower Bound | Upper Bound | | |
| rendemen | 0,1 | 3 | 2.133 | .2082 | .1202 | 1.616 | 2.650 | 1.9 | 2.3 |
| | 0,2 | 3 | 3.333 | 1.4048 | .8110 | -.156 | 6.823 | 2.0 | 4.8 |
| | 0.3 | 3 | 5.400 | 3.9611 | 2.2869 | -4.440 | 15.240 | 1.9 | 9.7 |
| | Total | 9 | 3.622 | 2.5445 | .8482 | 1.666 | 5.578 | 1.9 | 9.7 |
| antioksidan | 0,1 | 3 | 4.4838E2 | 79.678642 | 4.6002E1 | 250.45161 | 646.31705 | 357.910 | 508.095 |
| | 0,2 | 3 | 3.9259E2 | 278.372364 | 1.6071E2 | -298.92029 | 1084.11029 | 217.981 | 713.619 |
| | 0.3 | 3 | 8.0727E2 | 212.022283 | 1.2241E2 | 280.58178 | 1333.96688 | 641.176 | 1046.086 |
| | Total | 9 | 5.4941E2 | 264.919810 | 8.8306E1 | 345.78250 | 753.05328 | 217.981 | 1046.086 |
| totalgula | 0,1 | 3 | 1.1069E3 | 375.07340 | 2.1654E2 | 175.1994 | 2038.6673 | 780.00 | 1516.40 |
| | 0,2 | 3 | 1.3133E3 | 901.77224 | 5.2063E2 | -926.7931 | 3553.4598 | 288.00 | 1983.20 |
| | 0.3 | 3 | 6.9740E2 | 296.15354 | 1.7098E2 | -38.2862 | 1433.0862 | 357.60 | 900.60 |
| | Total | 9 | 1.0392E3 | 578.01954 | 1.9267E2 | 594.9171 | 1483.5274 | 288.00 | 1983.20 |
| totalfenolik | 0,1 | 3 | 2.7526E1 | 1.580630 | .912577 | 23.59950 | 31.45250 | 25.711 | 28.600 |
| | 0,2 | 3 | 4.6526E1 | 6.465891 | 3.733084 | 30.46384 | 62.58816 | 40.711 | 53.489 |
| | 0.3 | 3 | 1.2970E1 | .420812 | .242956 | 11.92531 | 14.01602 | 12.489 | 13.267 |
| | Total | 9 | 2.9007E1 | 14.949016 | 4.983005 | 17.51672 | 40.49839 | 12.489 | 53.489 |
| sulfat | 0,1 | 3 | 6.7600 | 3.70340 | 2.13816 | -2.4398 | 15.9598 | 3.32 | 10.68 |
| | 0,2 | 3 | 91.6133 | 30.86055 | 17.81734 | 14.9515 | 168.2752 | 64.28 | 125.08 |
| | 0.3 | 3 | 18.8133 | 7.17031 | 4.13978 | 1.0013 | 36.6254 | 14.28 | 27.08 |
| | Total | 9 | 39.0622 | 42.83721 | 14.27907 | 6.1346 | 71.9898 | 3.32 | 125.08 |

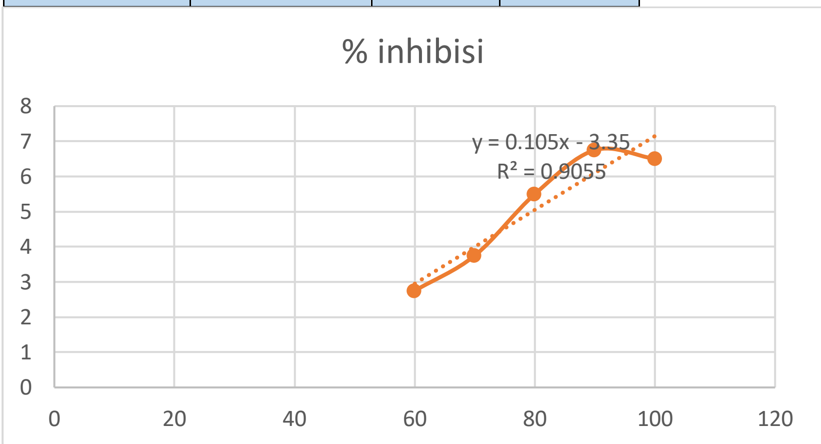
**ANOVA**

| | | Sum of Squares | df | Mean Square | F | Sig. |
|---|---|---|---|---|---|---|
| rendemen | Between Groups | 16.382 | 2 | 8.191 | 1.388 | .320 |
| | Within Groups | 35.413 | 6 | 5.902 | | |
| | Total | 51.796 | 8 | | | |
| antioksidan | Between Groups | 303874.755 | 2 | 151937.378 | 3.539 | .097 |
| | Within Groups | 257586.367 | 6 | 42931.061 | | |
| | Total | 561461.122 | 8 | | | |
| totalgula | Between Groups | 589692.382 | 2 | 294846.191 | .849 | .473 |
| | Within Groups | 2083160.293 | 6 | 347193.382 | | |
| | Total | 2672852.676 | 8 | | | |
| totalfenolik | Between Groups | 1698.818 | 2 | 849.409 | 57.285 | .000 |
| | Within Groups | 88.966 | 6 | 14.828 | | |
| | Total | 1787.785 | 8 | | | |
| sulfat | Between Groups | 12645.211 | 2 | 6322.606 | 18.642 | .003 |
| | Within Groups | 2035.004 | 6 | 339.167 | | |
| | Total | 14680.215 | 8 | | | |

Lampiran 7. Data Hasil Penelitian Antioksidan

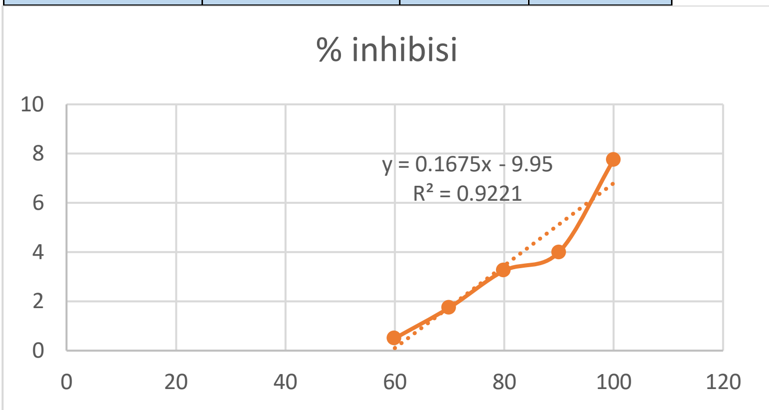
- Konsentrasi NaOH 0.1 M Ulangan 1

| **0,1.1** | | | |
|---|---|---|---|
| Konsentrasi (ppm) | Absorbansi | Kontrol | % inhibisi |
| 60 | 0,389 | 0,400 | 2,75 |
| 70 | 0,385 | 0,400 | 3,75 |
| 80 | 0,378 | 0,400 | 5,5 |
| 90 | 0,373 | 0,400 | 6,75 |
| 100 | 0,374 | 0,400 | 6,5 |
| IC50 | 508,095238 | | |



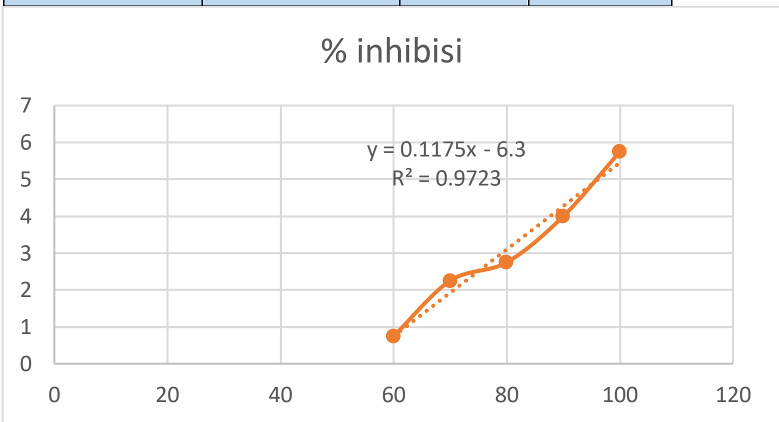
- Konsentrasi NaOH 0.1 M Ulangan 2

| **0,1.2** | | | |
|---|---|---|---|
| Konsentrasi (ppm) | Absorbansi | Kontrol | % inhibisi |
| 60 | 0,398 | 0,400 | 0,5 |
| 70 | 0,393 | 0,400 | 1,75 |
| 80 | 0,387 | 0,400 | 3,25 |
| 90 | 0,384 | 0,400 | 4 |
| 100 | 0,369 | 0,400 | 7,75 |
| IC50 | 357,9104478 | | |



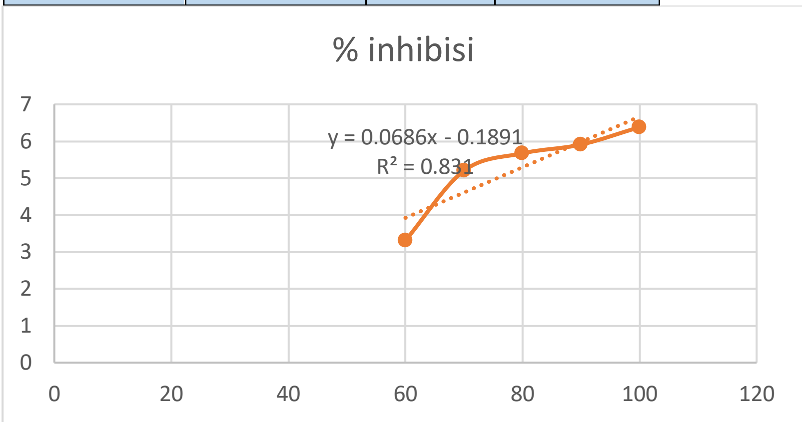

- Konsentrasi NaOH 0.1 M Ulangan 3

| **0,1.3** | | | |
|---|---|---|---|
| Konsentrasi (ppm) | Absorbansi | Kontrol | % inhibisi |
| 60 | 0,397 | 0,400 | 0,75 |
| 70 | 0,391 | 0,400 | 2,25 |
| 80 | 0,389 | 0,400 | 2,75 |
| 90 | 0,384 | 0,400 | 4 |
| 100 | 0,377 | 0,400 | 5,75 |
| IC50 | 479,1489362 | | |



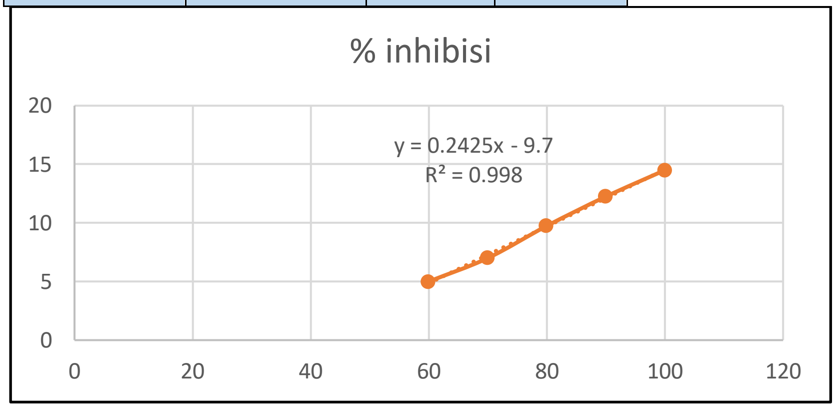
- Konsentrasi NaOH 0.2 M Ulangan 1

| **0,2.1** | | | |
|---|---|---|---|
| Konsentrasi (ppm) | Absorbansi | Kontrol | % inhibisi |
| 60 | 0,409 | 0,423 | 3,3096927 |
| 70 | 0,401 | 0,423 | 5,2009456 |
| 80 | 0,399 | 0,423 | 5,6737589 |
| 90 | 0,398 | 0,423 | 5,9101655 |
| 100 | 0,396 | 0,423 | 6,3829787 |
| IC50 | 731,619534 | | |



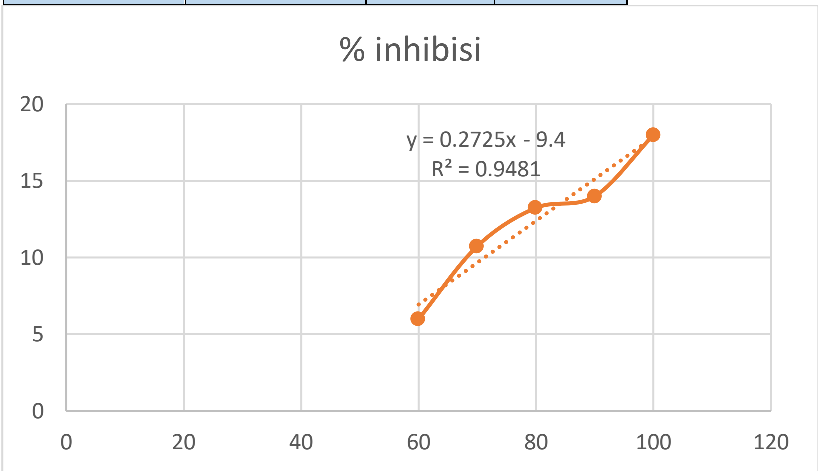

- Konsentrasi NaOH 0.2 M Ulangan 2

| **0,2.2** | | | |
|---|---|---|---|
| Konsentrasi (ppm) | Absorbansi | Kontrol | % inhibisi |
| 60 | 0,380 | 0,400 | 5 |
| 70 | 0,372 | 0,400 | 7,000 |
| 80 | 0,361 | 0,400 | 9,750 |
| 90 | 0,351 | 0,400 | 12,250 |
| 100 | 0,342 | 0,400 | 14,5 |
| IC50 | 246,185567 | | |



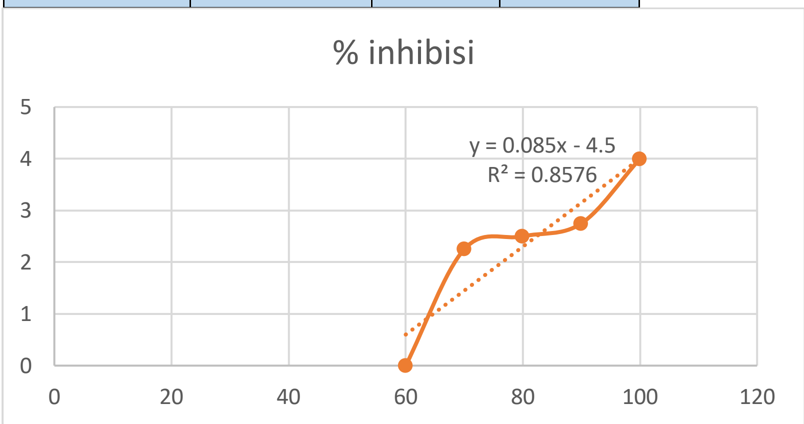
- Konsentrasi NaOH 0.2 M Ulangan 3

| **0,2.3** | | | |
|---|---|---|---|
| Konsentrasi (ppm) | Absorbansi | Kontrol | % inhibisi |
| 60 | 0,376 | 0,400 | 6 |
| 70 | 0,357 | 0,400 | 10,75 |
| 80 | 0,347 | 0,400 | 13,25 |
| 90 | 0,344 | 0,400 | 14 |
| 100 | 0,328 | 0,400 | 18 |
| IC50 | 217,981651 | | |



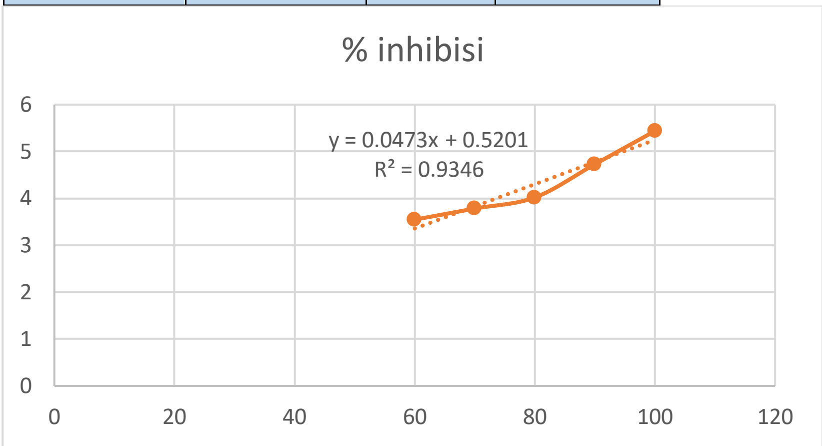

- Konsentrasi NaOH 0.3 M Ulangan 1

| **0,3.1** | | | |
|---|---|---|---|
| Konsentrasi (ppm) | Absorbansi | Kontrol | % inhibisi |
| 60 | 0,400 | 0,400 | 0 |
| 70 | 0,391 | 0,400 | 2,25 |
| 80 | 0,390 | 0,400 | 2,5 |
| 90 | 0,389 | 0,400 | 2,75 |
| 100 | 0,384 | 0,400 | 4 |
| IC50 | 641,176471 | | |



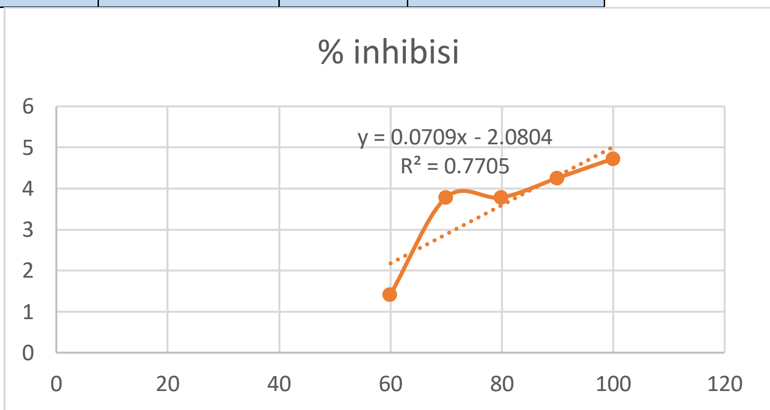
- Konsentrasi NaOH 0.3 M Ulangan 2

| **0,3.2** | | | |
|---|---|---|---|
| Konsentrasi (ppm) | Absorbansi | Kontrol | % inhibisi |
| 60 | 0,408 | 0,423 | 3,5460993 |
| 70 | 0,407 | 0,423 | 3,7825059 |
| 80 | 0,406 | 0,423 | 4,0189125 |
| 90 | 0,403 | 0,423 | 4,7281324 |
| 100 | 0,400 | 0,423 | 5,4373522 |
| IC50 | 1046,08668 | | |




- Konsentrasi NaOH 0.3 M Ulangan 3

| **0,3.3** | | | |
|---|---|---|---|
| Konsentrasi (ppm) | Absorbansi | Kontrol | % inhibisi |
| 60 | 0,417 | 0,423 | 1,418439716 |
| 70 | 0,407 | 0,423 | 3,78250591 |
| 80 | 0,407 | 0,423 | 3,78250591 |
| 90 | 0,405 | 0,423 | 4,255319149 |
| 100 | 0,403 | 0,423 | 4,728132388 |
| IC50 | 734,561354 | | |



Lampiran 8. Hasil Uji Statistik Antioksidan

**Descriptives**

| | | N | Mean | Std. Deviation | Std. Error | 95% Confidence Interval for Mean | | Minimum | Maximum |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | | Lower Bound | Upper Bound | | |
| rendemen | 0,1 | 3 | 2.133 | .2082 | .1202 | 1.616 | 2.650 | 1.9 | 2.3 |
| | 0,2 | 3 | 3.333 | 1.4048 | .8110 | -.156 | 6.823 | 2.0 | 4.8 |
| | 0.3 | 3 | 5.400 | 3.9611 | 2.2869 | -4.440 | 15.240 | 1.9 | 9.7 |
| | Total | 9 | 3.622 | 2.5445 | .8482 | 1.666 | 5.578 | 1.9 | 9.7 |
| antioksidan | 0,1 | 3 | 4.4838E2 | 79.678642 | 4.6002E1 | 250.45161 | 646.31705 | 357.910 | 508.095 |
| | 0,2 | 3 | 3.9259E2 | 278.372364 | 1.6071E2 | -298.92029 | 1084.11029 | 217.981 | 713.619 |
| | 0.3 | 3 | 8.0727E2 | 212.022283 | 1.2241E2 | 280.58178 | 1333.96688 | 641.176 | 1046.086 |
| | Total | 9 | 5.4941E2 | 264.919810 | 8.8306E1 | 345.78250 | 753.05328 | 217.981 | 1046.086 |
| totalgula | 0,1 | 3 | 1.1069E3 | 375.07340 | 2.1654E2 | 175.1994 | 2038.6673 | 780.00 | 1516.40 |
| | 0,2 | 3 | 1.3133E3 | 901.77224 | 5.2063E2 | -926.7931 | 3553.4598 | 288.00 | 1983.20 |
| | 0.3 | 3 | 6.9740E2 | 296.15354 | 1.7098E2 | -38.2862 | 1433.0862 | 357.60 | 900.60 |
| | Total | 9 | 1.0392E3 | 578.01954 | 1.9267E2 | 594.9171 | 1483.5274 | 288.00 | 1983.20 |
| totalfenolik | 0,1 | 3 | 2.7526E1 | 1.580630 | .912577 | 23.59950 | 31.45250 | 25.711 | 28.600 |
| | 0,2 | 3 | 4.6526E1 | 6.465891 | 3.733084 | 30.46384 | 62.58816 | 40.711 | 53.489 |
| | 0.3 | 3 | 1.2970E1 | .420812 | .242956 | 11.92531 | 14.01602 | 12.489 | 13.267 |
| | Total | 9 | 2.9007E1 | 14.949016 | 4.983005 | 17.51672 | 40.49839 | 12.489 | 53.489 |
| sulfat | 0,1 | 3 | 6.7600 | 3.70340 | 2.13816 | -2.4398 | 15.9598 | 3.32 | 10.68 |
| | 0,2 | 3 | 91.6133 | 30.86055 | 17.81734 | 14.9515 | 168.2752 | 64.28 | 125.08 |
| | 0.3 | 3 | 18.8133 | 7.17031 | 4.13978 | 1.0013 | 36.6254 | 14.28 | 27.08 |
| | Total | 9 | 39.0622 | 42.83721 | 14.27907 | 6.1346 | 71.9898 | 3.32 | 125.08 |

**ANOVA**

| | | Sum of Squares | df | Mean Square | F | Sig. |
|---|---|---|---|---|---|---|
| rendemen | Between Groups | 16.382 | 2 | 8.191 | 1.388 | .320 |
| | Within Groups | 35.413 | 6 | 5.902 | | |
| | Total | 51.796 | 8 | | | |
| antioksidan | Between Groups | 303874.755 | 2 | 151937.378 | 3.539 | .097 |
| | Within Groups | 257586.367 | 6 | 42931.061 | | |
| | Total | 561461.122 | 8 | | | |
| totalgula | Between Groups | 589692.382 | 2 | 294846.191 | .849 | .473 |
| | Within Groups | 2083160.293 | 6 | 347193.382 | | |
| | Total | 2672852.676 | 8 | | | |
| totalfenolik | Between Groups | 1698.818 | 2 | 849.409 | 57.285 | .000 |
| | Within Groups | 88.966 | 6 | 14.828 | | |
| | Total | 1787.785 | 8 | | | |
| sulfat | Between Groups | 12645.211 | 2 | 6322.606 | 18.642 | .003 |
| | Within Groups | 2035.004 | 6 | 339.167 | | |
| | Total | 14680.215 | 8 | | | |

## Lampiran 9. Data Hasil Penelitian Total Fenolik

Persamaan y= 0.0018x + 0.0296

| Panjang gelombang | Perlakuan | Absorbansi | Berat hasil evaporasi (gram) | Berat sampel ditimbang (gr)/10 ml EtOH 70% | FP | Konsentrasi (µg/mL) | Total Fenol dalam 0,1 gr (µg) | Total Fenol dalam 1 gr (mg) | Total Fenol dalam berat hsil eva (mg) | Total Fenol mg GAE/gr | Rata-rata |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 782 | 0.1 | 0,287 | 2,2 | 0,1 | 2 | 286,000 | 2860,000 | 28,600 | 62,920 | 28,600 | 27,526 |
| | | 0,261 | 1,9 | 0,1 | | 257,111 | 2571,111 | 25,711 | 56,564 | 25,711 | |
| | | 0,284 | 2,3 | 0,1 | | 282,667 | 2826,667 | 28,267 | 62,187 | 28,267 | |
| | 0.2 | 0,511 | 3,3 | 0,1 | | 534,889 | 5348,889 | 53,489 | 176,513 | 53,489 | 46,526 |
| | | 0,438 | 2 | 0,1 | | 453,778 | 4537,778 | 45,378 | 90,756 | 45,378 | |
| | | 0,396 | 4,8 | 0,1 | | 407,111 | 4071,111 | 40,711 | 195,413 | 40,711 | |
| | 0.3 | 0,149 | 4,6 | 0,1 | | 132,667 | 1326,667 | 13,267 | 61,027 | 13,267 | 12,970 |
| | | 0,148 | 1,9 | 0,1 | | 131,556 | 1315,556 | 13,156 | 24,996 | 13,156 | |
| | | 0,142 | 9,7 | 0,1 | | 124,889 | 1248,889 | 12,489 | 121,142 | 12,489 | |

## Lampiran 10. Hasil Uji Statistik Total Fenolik

**Descriptives**

| | | N | Mean | Std. Deviation | Std. Error | 95% Confidence Interval for Mean Lower Bound | 95% Confidence Interval for Mean Upper Bound | Minimum | Maximum |
|---|---|---|---|---|---|---|---|---|---|
| rendemen | 0,1 | 3 | 2.133 | .2082 | .1202 | 1.616 | 2.650 | 1.9 | 2.3 |
| | 0,2 | 3 | 3.333 | 1.4048 | .8110 | -.156 | 6.823 | 2.0 | 4.8 |
| | 0.3 | 3 | 5.400 | 3.9611 | 2.2869 | -4.440 | 15.240 | 1.9 | 9.7 |
| | Total | 9 | 3.622 | 2.5445 | .8482 | 1.666 | 5.578 | 1.9 | 9.7 |
| antioksidan | 0,1 | 3 | 4.4838E2 | 79.678642 | 4.6002E1 | 250.45161 | 646.31705 | 357.910 | 508.095 |
| | 0,2 | 3 | 3.9259E2 | 278.372364 | 1.6071E2 | -298.92029 | 1084.11029 | 217.981 | 713.619 |
| | 0.3 | 3 | 8.0727E2 | 212.022283 | 1.2241E2 | 280.58178 | 1333.96688 | 641.176 | 1046.086 |
| | Total | 9 | 5.4941E2 | 264.919810 | 8.8306E1 | 345.78250 | 753.05328 | 217.981 | 1046.086 |
| totalgula | 0,1 | 3 | 1.1069E3 | 375.07340 | 2.1654E2 | 175.1994 | 2038.6673 | 780.00 | 1516.40 |
| | 0,2 | 3 | 1.3133E3 | 901.77224 | 5.2063E2 | -926.7931 | 3553.4598 | 288.00 | 1983.20 |
| | 0.3 | 3 | 6.9740E2 | 296.15354 | 1.7098E2 | -38.2862 | 1433.0862 | 357.60 | 900.60 |
| | Total | 9 | 1.0392E3 | 578.01954 | 1.9267E2 | 594.9171 | 1483.5274 | 288.00 | 1983.20 |
| totalfenolik | 0,1 | 3 | 2.7526E1 | 1.580630 | .912577 | 23.59950 | 31.45250 | 25.711 | 28.600 |
| | 0,2 | 3 | 4.6526E1 | 6.465891 | 3.733084 | 30.46384 | 62.58816 | 40.711 | 53.489 |
| | 0.3 | 3 | 1.2970E1 | .420812 | .242956 | 11.92531 | 14.01602 | 12.489 | 13.267 |
| | Total | 9 | 2.9007E1 | 14.949016 | 4.983005 | 17.51672 | 40.49839 | 12.489 | 53.489 |
| sulfat | 0,1 | 3 | 6.7600 | 3.70340 | 2.13816 | -2.4398 | 15.9598 | 3.32 | 10.68 |
| | 0,2 | 3 | 91.6133 | 30.86055 | 17.81734 | 14.9515 | 168.2752 | 64.28 | 125.08 |
| | 0.3 | 3 | 18.8133 | 7.17031 | 4.13978 | 1.0013 | 36.6254 | 14.28 | 27.08 |
| | Total | 9 | 39.0622 | 42.83721 | 14.27907 | 6.1346 | 71.9898 | 3.32 | 125.08 |

**ANOVA**

| | | Sum of Squares | df | Mean Square | F | Sig. |
|---|---|---|---|---|---|---|
| rendemen | Between Groups | 16.382 | 2 | 8.191 | 1.388 | .320 |
| | Within Groups | 35.413 | 6 | 5.902 | | |
| | Total | 51.796 | 8 | | | |
| antioksidan | Between Groups | 303874.755 | 2 | 151937.378 | 3.539 | .097 |
| | Within Groups | 257586.367 | 6 | 42931.061 | | |
| | Total | 561461.122 | 8 | | | |
| totalgula | Between Groups | 589692.382 | 2 | 294846.191 | .849 | .473 |
| | Within Groups | 2083160.293 | 6 | 347193.382 | | |
| | Total | 2672852.676 | 8 | | | |
| totalfenolik | Between Groups | 1698.818 | 2 | 849.409 | 57.285 | .000 |
| | Within Groups | 88.966 | 6 | 14.828 | | |
| | Total | 1787.785 | 8 | | | |
| sulfat | Between Groups | 12645.211 | 2 | 6322.606 | 18.642 | .003 |
| | Within Groups | 2035.004 | 6 | 339.167 | | |
| | Total | 14680.215 | 8 | | | |

Lampiran 11. Hasil Uji Lanjut Duncan Total Fenolik

**totalfenolik**

Duncan

| rendemen | N | Subset for alpha = 0.05 | | |
|---|---|---|---|---|
| | | 1 | 2 | 3 |
| 0.3 | 3 | 12.9707 | | |
| 0,1 | 3 | | 27.5260 | |
| 0,2 | 3 | | | 46.5260 |
| Sig. | | 1.000 | 1.000 | 1.000 |

Lampiran 12. Data Hasil Penelitian Total Sulfat

| **Konsentrasi NaOH** | **Absorbansi** | | |
|---|---|---|---|
| | **Ulangan 1** | **Ulangan 2** | **Ulangan 3** |
| 0,1 M | 0,141 | 0,117 | 0,152 |
| 0,2 M | 0,438 | 0,286 | 0,339 |
| 0,3 M | 0,163 | 0,193 | 0,161 |

Lampiran 13. Perhitungan Total Sulfat

Y = 0,005x + 0,1253

FP = 2

Konsentrasi NaOH 0,1 M ulangan 1

$$0{,}141 = 0{,}005x + 0{,}1253$$

$$0{,}141 - 0{,}1253 = 0{,}005x$$

$$0{,}0157 = 0{,}005x$$

$$x = \frac{0{,}0157}{0{,}005} = 3{,}14 \times 2 = 6{,}28\ mg/ml$$

Konsentrasi NaOH 0,1 M ulangan 2

$$0{,}117 = 0{,}005x + 0{,}1253$$
$$0{,}117 - 0{,}1253 = 0{,}005x$$
$$0{,}0083 = 0{,}005x$$
$$x = \frac{0{,}0083}{0{,}005} = 1{,}66 \times 2 = 3{,}32\ mg/ml$$

Konsentrasi NaOH 0,1 M ulangan 3

$$0{,}152 = 0{,}005x + 0{,}1253$$
$$0{,}152 - 0{,}1253 = 0{,}005x$$
$$0{,}0152 = 0{,}005x$$
$$x = \frac{0{,}152}{0{,}005} = 5{,}34 \times 2 = 10{,}68\ mg/ml$$

Rata-rata = $\frac{6{,}28+3{,}32+10{,}68}{3} = 6{,}67\ mg/ml$

Konsentrasi NaOH 0,2 M ulangan 1

$$0{,}438 = 0{,}005x + 0{,}1253$$
$$0{,}438 - 0{,}1253 = 0{,}005x$$
$$0{,}3127 = 0{,}005x$$
$$x = \frac{0{,}3127}{0{,}005} = 62{,}54 \times 2 = 125{,}08\ mg/ml$$

Konsentrasi NaOH 0,2 M ulangan 2

$$0{,}286 = 0{,}005x + 0{,}1253$$
$$0{,}286 - 0{,}1253 = 0{,}005x$$
$$0{,}1607 = 0{,}005x$$
$$x = \frac{0{,}1607}{0{,}005} = 32{,}14 \times 2 = 64{,}28\ mg/ml$$

Konsentrasi NaOH 0,2 M ulangan 3

$$0{,}339 = 0{,}005x + 0{,}1253$$
$$0{,}339 - 0{,}1253 = 0{,}005x$$
$$0{,}2137 = 0{,}005x$$
$$x = \frac{0{,}2137}{0{,}005} = 42{,}74 \times 2 = 85{,}48\ mg/ml$$

Rata-rata = $\frac{125{,}08+64{,}28+85{,}48}{3} = 91{,}613\ mg/ml$

Konsentrasi NaOH 0,3 M ulangan 1

$$0{,}163 = 0{,}005x + 0{,}1253$$
$$0{,}163 - 0{,}1253 = 0{,}005x$$
$$0{,}0377 = 0{,}005x$$

$$x = \frac{0,0377}{0,005} = 7,54 \times 2 = 15,08\ mg/ml$$

Konsentrasi NaOH 0,3 M ulangan 2

$$0,193 = 0,005x + 0,1253$$

$$0,193 - 0,1253 = 0,005x$$

$$0,0677 = 0,005x$$

$$x = \frac{0,0677}{0,005} = 13,54 \times 2 = 27,08\ mg/ml$$

Konsentrasi NaOH 0,3 M ulangan 3

$$0,161 = 0,005x + 0,1253$$

$$0,161 - 0,1253 = 0,005x$$

$$0,0357 = 0,005x$$

$$x = \frac{0,0357}{0,005} = 7,14 \times 2 = 14,28\ mg/ml$$

Rata-rata = $\frac{15,08+27,08+14,28}{3} = 18,813\ mg/ml$

Lampiran 14. Data Hasil Statistik Total Sulfat

**Descriptives**

| | | | | | | 95% Confidence Interval for Mean | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | N | Mean | Std. Deviation | Std. Error | Lower Bound | Upper Bound | Minimum | Maximum |
| rendemen | 0,1 | 3 | 2.133 | .2082 | .1202 | 1.616 | 2.650 | 1.9 | 2.3 |
| | 0,2 | 3 | 3.333 | 1.4048 | .8110 | -.156 | 6.823 | 2.0 | 4.8 |
| | 0.3 | 3 | 5.400 | 3.9611 | 2.2869 | -4.440 | 15.240 | 1.9 | 9.7 |
| | Total | 9 | 3.622 | 2.5445 | .8482 | 1.666 | 5.578 | 1.9 | 9.7 |
| antioksidan | 0,1 | 3 | 4.4838E2 | 79.678642 | 4.6002E1 | 250.45161 | 646.31705 | 357.910 | 508.095 |
| | 0,2 | 3 | 3.9259E2 | 278.372364 | 1.6071E2 | -298.92029 | 1084.11029 | 217.981 | 713.619 |
| | 0.3 | 3 | 8.0727E2 | 212.022283 | 1.2241E2 | 280.58178 | 1333.96688 | 641.176 | 1046.086 |
| | Total | 9 | 5.4941E2 | 264.919810 | 8.8306E1 | 345.78250 | 753.05328 | 217.981 | 1046.086 |
| totalgula | 0,1 | 3 | 1.1069E3 | 375.07340 | 2.1654E2 | 175.1994 | 2038.6673 | 780.00 | 1516.40 |
| | 0,2 | 3 | 1.3133E3 | 901.77224 | 5.2063E2 | -926.7931 | 3553.4598 | 288.00 | 1983.20 |
| | 0.3 | 3 | 6.9740E2 | 296.15354 | 1.7098E2 | -38.2862 | 1433.0862 | 357.60 | 900.60 |
| | Total | 9 | 1.0392E3 | 578.01954 | 1.9267E2 | 594.9171 | 1483.5274 | 288.00 | 1983.20 |
| totalfenolik | 0,1 | 3 | 2.7526E1 | 1.580630 | .912577 | 23.59950 | 31.45250 | 25.711 | 28.600 |
| | 0,2 | 3 | 4.6526E1 | 6.465891 | 3.733084 | 30.46384 | 62.58816 | 40.711 | 53.489 |
| | 0.3 | 3 | 1.2970E1 | .420812 | .242956 | 11.92531 | 14.01602 | 12.489 | 13.267 |
| | Total | 9 | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] |
| sulfat | 0,1 | 3 | 6.7600 | 3.70340 | 2.13816 | -2.4398 | 15.9598 | 3.32 | 10.68 |
| | 0,2 | 3 | 91.6133 | 30.86055 | 17.81734 | 14.9515 | 168.2752 | 64.28 | 125.08 |
| | 0.3 | 3 | 18.8133 | 7.17031 | 4.13978 | 1.0013 | 36.6254 | 14.28 | 27.08 |
| | Total | 9 | 39.0622 | 42.83721 | 14.27907 | 6.1346 | 71.9898 | 3.32 | 125.08 |

**ANOVA**

| | | Sum of Squares | df | Mean Square | F | Sig. |
|---|---|---|---|---|---|---|
| rendemen | Between Groups | 16.382 | 2 | 8.191 | 1.388 | .320 |
| | Within Groups | 35.413 | 6 | 5.902 | | |
| | Total | 51.796 | 8 | | | |
| antioksidan | Between Groups | 303874.755 | 2 | 151937.378 | 3.539 | .097 |
| | Within Groups | 257586.367 | 6 | 42931.061 | | |
| | Total | 561461.122 | 8 | | | |
| totalgula | Between Groups | 589692.382 | 2 | 294846.191 | .849 | .473 |
| | Within Groups | 2083160.293 | 6 | 347193.382 | | |
| | Total | 2672852.676 | 8 | | | |
| totalfenolik | Between Groups | 1698.818 | 2 | 849.409 | 57.285 | .000 |
| | Within Groups | 88.966 | 6 | 14.828 | | |
| | Total | 1787.785 | 8 | | | |
| sulfat | Between Groups | 12645.211 | 2 | 6322.606 | 18.642 | .003 |
| | Within Groups | 2035.004 | 6 | 339.167 | | |
| | Total | 14680.215 | 8 | | | |

Lampiran 15. Hasil Uji Lanjut Duncan Total Sulfat

**sulfat**

Duncan

| rendemen | N | Subset for alpha = 0.05 | |
|---|---|---|---|
| | | 1 | 2 |
| 0,1 | 3 | 6.7600 | |
| 0.3 | 3 | 18.8133 | |
| 0,2 | 3 | | 91.6133 |
| Sig. | | .453 | 1.000 |

Lampiran 16. Dokumentasi Penelitian

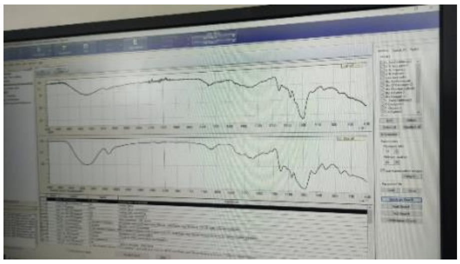
*Pre-treatment* Jahe Merah

Ekstraksi Polisakarida Metode *Alkaline Solution Extraction*

Rendemen (*Yield*)

Penentuan Gugus Fungsional (FT-IR)

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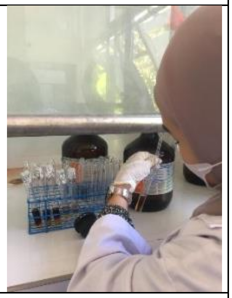
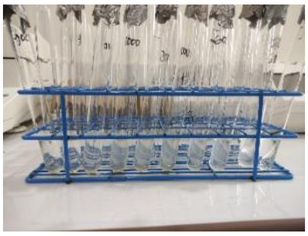
<tr><td></td><td></td><td></td><td></td></tr>
<tr><td></td><td></td><td></td><td></td></tr>
<tr><td colspan="4">Penentuan Total Gula</td></tr>
<tr><td></td><td></td><td colspan="2"></td></tr>
<tr><td colspan="4">Pengujian Total Fenolik</td></tr>
<tr><td></td><td></td><td colspan="2"></td></tr>
<tr><td colspan="4">Penentuan Sulfat</td></tr>
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