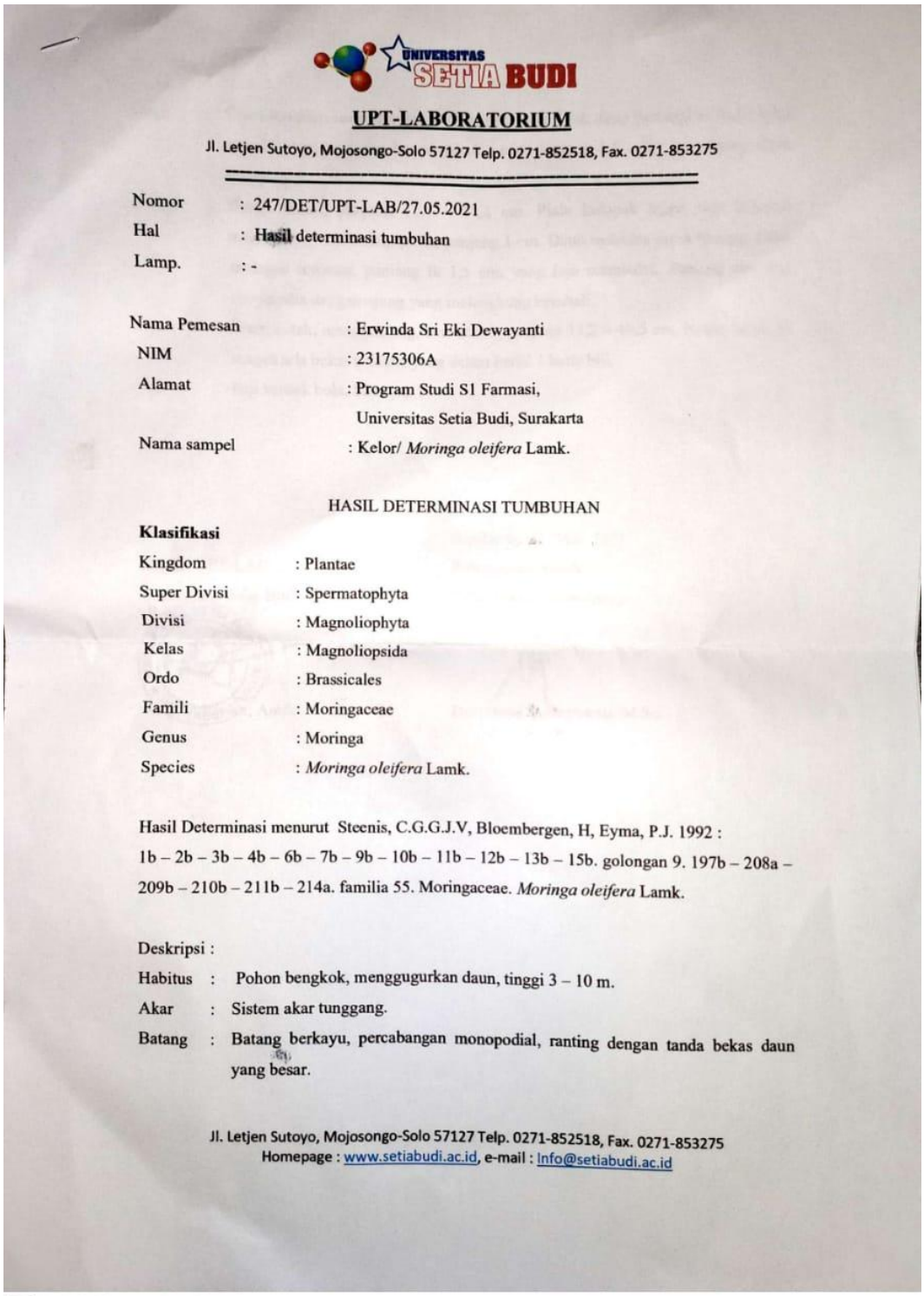
# L A M P I R A N

## Lampiran 1. Hasil Determinasi Biji Kelor



UNIVERSITAS SETIA BUDI

**UPT-LABORATORIUM**

Jl. Letjen Sutoyo, Mojosongo-Solo 57127 Telp. 0271-852518, Fax. 0271-853275

Nomor : 247/DET/UPT-LAB/27.05.2021
Hal : Hasil determinasi tumbuhan
Lamp. : -

Nama Pemesan : Erwinda Sri Eki Dewayanti
NIM : 23175306A
Alamat : Program Studi S1 Farmasi, Universitas Setia Budi, Surakarta
Nama sampel : Kelor/ *Moringa oleifera* Lamk.

HASIL DETERMINASI TUMBUHAN

**Klasifikasi**

Kingdom : Plantae
Super Divisi : Spermatophyta
Divisi : Magnoliophyta
Kelas : Magnoliopsida
Ordo : Brassicales
Famili : Moringaceae
Genus : Moringa
Species : *Moringa oleifera* Lamk.

Hasil Determinasi menurut Steenis, C.G.G.J.V, Bloembergen, H, Eyma, P.J. 1992 : 1b – 2b – 3b – 4b – 6b – 7b – 9b – 10b – 11b – 12b – 13b – 15b. golongan 9. 197b – 208a – 209b – 210b – 211b – 214a. familia 55. Moringaceae. *Moringa oleifera* Lamk.

Deskripsi :

Habitus : Pohon bengkok, menggugurkan daun, tinggi 3 – 10 m.
Akar : Sistem akar tunggang.
Batang : Batang berkayu, percabangan monopodial, ranting dengan tanda bekas daun yang besar.

Jl. Letjen Sutoyo, Mojosongo-Solo 57127 Telp. 0271-852518, Fax. 0271-853275
Homepage : www.setiabudi.ac.id, e-mail : Info@setiabudi.ac.id

Dipindai dengan CamScanner

Daun : Daun tersebar, menyirip ganjil rangkap 2 – 4. Anak daun bertangkai, bulat telur terbalik, tepi rata, sisi bawah hijau pucat, panjang 1,6 – 2,1 cm, tulang daun menyirip.

Bunga : Bunga malai, panjang 11,4 – 14,1 cm. Piala kelopak hijau, taju kelopak melengkung membalik, putih, panjang 1 cm. Daun mahkota putih kuning, yang terdepan terbesar, panjang lk 1,5 cm, yang lain membalik. Benang sari dan staminodia dengan ujung yang melengkung kembali.

Buah : Buah kotak, menggantung, bersudut 3, panjang 33,2 – 46,5 cm. Katup tebal, di tengah ada bekas cetakan yang dalam berisi 1 baris biji.

Biji : Biji bentuk bola, bersayap 3.

Surakarta, 27 Mei 2021

Kepala UPT-LAB
Universitas Setia Budi

Asih Tabroni, Amdk

Penanggung jawab
Determinasi Tumbuhan

Dra. Dewi Sulistyawati. M.Sc.

Jl. Letjen Sutoyo, Mojosongo-Solo 57127 Telp. 0271-852518, Fax. 0271-853275
Homepage : www.setiabudi.ac.id, e-mail : Info@setiabudi.ac.id

Dipindai dengan CamScanner

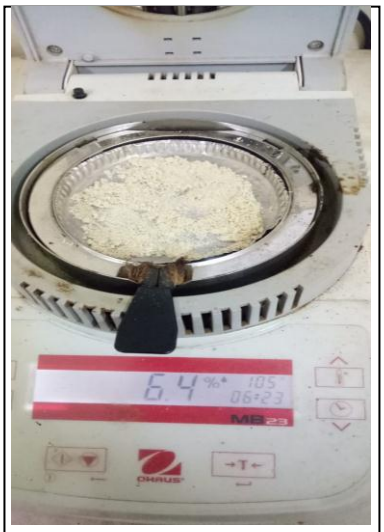
**Lampiran 2. Hasil Pengumpulan Bahan dan Pembuatan Ekstrak**




Biji Kelor Serbuk biji kelor Proses sohxletasi Ekstrak biji kelor

**Lampiran 3. Hasil Penetapan Susut Pengeringan Serbuk**


Replikasi 1




Replikasi 2

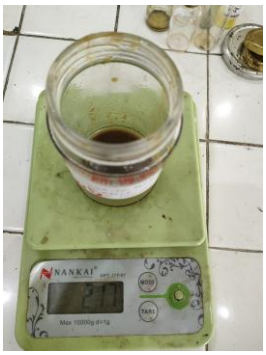

Replikasi 3

**Lampiran 4. Perhitungan Rendemen Ekstrak Biji Kelor**

Rendemen ekstrak $= \frac{Bobot\ ekstrak}{Bobot\ serbuk} x100\%$

$= \frac{30,4}{800} x100\%$

Rendemen esktrak $= 3,8\%$



**Lampiran 5. Perhitungan Kadar Air Ekstrak**

| Bobot (gram) | Replikasi | | |
|---|---|---|---|
| | I | II | III |
| **Kurs kosong konstan** | 39,575 | 39,731 | 38,656 |
| **Kurs kosong + ekstrak** | 40,646 | 40,850 | 39,694 |
| **Ekstrak basah** | 1,071 | 1,119 | 1,038 |
| **Proses oven selama 5 jam** | | | |
| **Kurs + esktrak** | 40,487 | 40,682 | 39,533 |
| **Ekstrak kering** | 0,912 | 0,951 | 0,877 |
| **Susut pengeringan (%)** | 14,846 | 15,013 | 15,511 |
| **Rata-rata (%)** | 15,123 | | |

**Perhitungan susut pengeringan**

**Kadar air** $= \frac{\boldsymbol{bobot\ ekstrak\ basah - Bobot\ ekstrak\ kering}}{\boldsymbol{bobot\ ekstrak\ basah}} \boldsymbol{x100}\%$

**Replikasi 1** $= \frac{1,071-0,912}{1,071} x100\%$

$= 14,846\%$

**Replikasi 2** $= \frac{1,119-0,951}{0,951} x100\%$

$= 15,013$

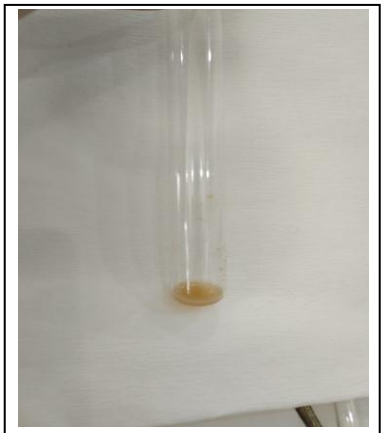
**Replikasi 3** $= \frac{1,038-0,877}{1,038} x100\%$

$= 15,511\%$

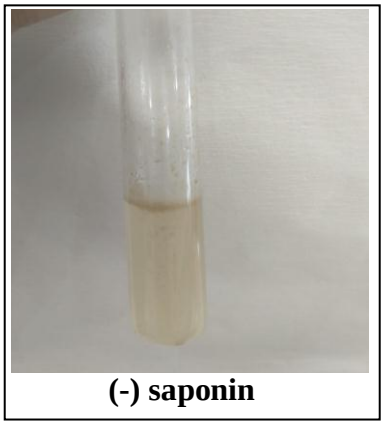
**Lampiran 6. Hasil uji tabung ekstrak biji kelor**

**(+) Flavonoid**

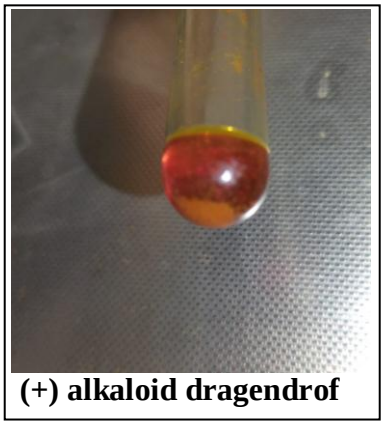
**(+) Tanin**



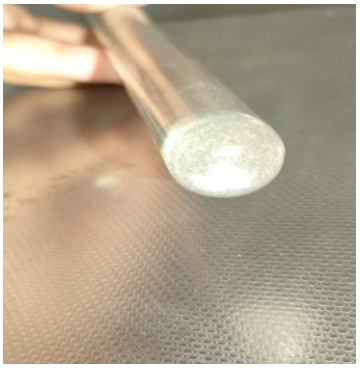
**(-) Triterpenoid/ Steroid**



**(-) saponin**



**(+) alkaloid dragendrof**



**(+) alkaloid mayer**

**Lampiran 7. Formula Nanosuspensi Ekstrak Biji Kelor**


**Lampiran 8. Hasil uji ukuran partikel dan PI nanosuspensi ekstrak biji**

**Size Distribution Report by Number**
*v2.2*

Malvern

**Sample Details**

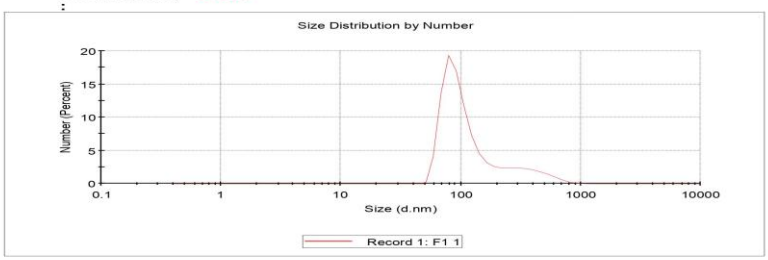
| | | | |
|---|---|---|---|
| **Sample Name:** | F1 1 | | |
| **SOP Name:** | mansettings.nano | | |
| **General Notes:** | | | |
| **File Name:** | Erwinda 2021.dts | **Dispersant Name:** | Water |
| **Record Number:** | 1 | **Dispersant RI:** | 1,330 |
| **Material RI:** | 1,30 | **Viscosity (cP):** | 0,8872 |
| **Material Absorbtion:** | 0,100 | **Measurement Date and Time:** | 11 Juni 2021 10:07:03 |

**System**

| | | | |
|---|---|---|---|
| **Temperature (°C):** | 25,0 | **Duration Used (s):** | 60 |
| **Count Rate (kcps):** | 257,7 | **Measurement Position (mm):** | 0,85 |
| **Cell Description:** | Disposable sizing cuvette | **Attenuator:** | 7 |

**Results**

| | | | Size (d.n... | % Number: | St Dev (d.n... |
|---|---|---|---|---|---|
| **Z-Average (d.nm):** | 338,9 | **Peak 1:** | 104,0 | 86,1 | 43,57 |
| **PdI:** | 0,384 | **Peak 2:** | 406,3 | 13,9 | 142,9 |
| **Intercept:** | 0,944 | **Peak 3:** | 0,000 | 0,0 | 0,000 |
| **Result quality :** | Good | | | | |



**Data sebelum uji stabilitas penyimpanan**

| Replikasi | Ukuran Partikel (nm) | | | PI | | |
|---|---|---|---|---|---|---|
| | F1 | F2 | F3 | F1 | F2 | F3 |
| 1 | 338,9 | 595,3 | 948,7 | 0,384 | 0,569 | 0,791 |
| 2 | 350,8 | 528,0 | 555,5 | 0,414 | 0,756 | 0,568 |
| 3 | 342,9 | 536,3 | 586,4 | 0,408 | 0,641 | 0,505 |
| 4 | 354,0 | 483,7 | 573,0 | 0,392 | 0,696 | 0,580 |
| 5 | 365,5 | 461,8 | 419,0 | 0,377 | 0,797 | 0,622 |
| Rata-rata | 350,42 | 521,02 | 616,52 | 0,395 | 0,691 | 0,613 |
| SD | 10,36 | 51,72 | 197,41 | 0,015 | 0,090 | 0,107 |

**Data sebelum uji stabilitas penyimpanan**

| Replikasi | Ukuran Partikel (nm) | | | PI | | |
|---|---|---|---|---|---|---|
| | F1 | F2 | F3 | F1 | F2 | F3 |
| 1 | 189,1 | 72,05 | 1537 | 0,224 | 0,484 | 0,889 |
| 2 | 194,8 | 68,27 | 639,2 | 0,179 | 0,517 | 0,601 |
| 3 | 139,4 | 62,91 | 696,4 | 0,189 | 0,609 | 0,666 |
| 4 | 192,7 | 66,13 | 626,4 | 0,187 | 0,558 | 0,776 |
| 5 | 192,6 | 62,52 | 558,6 | 0,186 | 0,604 | 0,938 |
| Rata-rata | 181,72 | 66,376 | 811,52 | 0,193 | 0,554 | 0,774 |
| SD | 23,746 | 3,960 | 408,505 | 0,018 | 0,054 | 0,143 |

**Lampiran 9. Hasil Uji Normalitas ukuran Partikel dan Polidispersitas**

**Sebelum uji stabilitas penyimpanan**

**Tests of Normality**

| | | Kolmogorov-Smirnov[a] | | | Shapiro-Wilk | | |
|---|---|---|---|---|---|---|---|
| | Formula | Statistic | df | Sig. | Statistic | df | Sig. |
| Ukuran Partikel | F1 | .166 | 5 | .200* | .965 | 5 | .840 |
| | F2 | .184 | 5 | .200* | .961 | 5 | .818 |
| | F3 | .361 | 5 | .032 | .829 | 5 | .137 |

*. This is a lower bound of the true significance.

a. Lilliefors Significance Correction

**Tests of Normality**

| | | Kolmogorov-Smirnov[a] | | | Shapiro-Wilk | | |
|---|---|---|---|---|---|---|---|
| | Formula | Statistic | df | Sig. | Statistic | df | Sig. |
| Polidispersitas | F1 | .196 | 5 | .200* | .938 | 5 | .653 |
| | F2 | .161 | 5 | .200* | .978 | 5 | .924 |
| | F3 | .267 | 5 | .200* | .886 | 5 | .340 |

*. This is a lower bound of the true significance.

a. Lilliefors Significance Correction

**Setelah uji stabilitas penyimpanan**

**Tests of Normality**

| | | Kolmogorov-Smirnov[a] | | | Shapiro-Wilk | | |
|---|---|---|---|---|---|---|---|
| | Formula | Statistic | df | Sig. | Statistic | df | Sig. |
| Ukuran Partikel | F1 | .422 | 5 | .004 | .630 | 5 | .002 |
| | F2 | .209 | 5 | .200* | .928 | 5 | .580 |
| | F3 | .411 | 5 | .006 | .667 | 5 | .004 |

**Tests of Normality**

| | | Kolmogorov-Smirnov[a] | | | Shapiro-Wilk | | |
|---|---|---|---|---|---|---|---|
| | Formula | Statistic | df | Sig. | Statistic | df | Sig. |
| Polidispersitas | F1 | .389 | 5 | .013 | .746 | 5 | .027 |
| | F2 | .219 | 5 | .200* | .917 | 5 | .513 |
| | F3 | .189 | 5 | .200* | .944 | 5 | .697 |

*. This is a lower bound of the true significance.

a. Lilliefors Significance Correction

## Lampiran 10. Hasil uji Paired Simple T test Ukuran Partikel dan Polidispersitas

**T-Test**

**Paired Samples Statistics**

| | | Mean | N | Std. Deviation | Std. Error Mean |
|---|---|---|---|---|---|
| Pair 1 | Polidispersitas F2 Sblm | .69180 | 5 | .090646 | .040538 |
| | Polidispersitas F2 Stlh | .61320 | 5 | .107869 | .048240 |
| Pair 2 | Polidispersitas F3 Sblm | .55440 | 5 | .054335 | .024299 |
| | Polidispersitas F3 Stlh | .77400 | 5 | .142932 | .063921 |

**Paired Samples Correlations**

| | | N | Correlation | Sig. |
|---|---|---|---|---|
| Pair 1 | Polidispersitas F2 Sblm & Polidispersitas F2 Stlh | 5 | -.472 | .422 |
| Pair 2 | Polidispersitas F3 Sblm & Polidispersitas F3 Stlh | 5 | .020 | .975 |

**Paired Samples Test**

| | | Paired Differences | | | | | t | df | Sig. (2-tailed) |
|---|---|---|---|---|---|---|---|---|---|
| | | Mean | Std. Deviation | Std. Error Mean | 95% Confidence Interval of the Difference Lower | Upper | | | |
| Pair 1 | Polidispersitas F2 Sblm - Polidispersitas F2 Stlh | .078600 | .170525 | .076261 | -.133135 | .290335 | 1.031 | 4 | .361 |
| Pair 2 | Polidispersitas F3 Sblm - Polidispersitas F3 Stlh | -.219600 | .151896 | .067930 | -.408203 | -.030997 | -3.233 | 4 | .032 |

**T-Test**

**Paired Samples Statistics**

| | | Mean | N | Std. Deviation | Std. Error Mean |
|---|---|---|---|---|---|
| Pair 1 | Ukuran Partikel F2 Sblm | 521.0200 | 5 | 51.71921 | 23.12954 |
| | Ukuran Partikel F2 Stlh | 66.3760 | 5 | 3.95992 | 1.77093 |

**Paired Samples Correlations**

| | | N | Correlation | Sig. |
|---|---|---|---|---|
| Pair 1 | Ukuran Partikel F2 Sblm & Ukuran Partikel F2 Stlh | 5 | .756 | .139 |

**Paired Samples Test**

| | | Paired Differences | | | | | t | df | Sig. (2-tailed) |
|---|---|---|---|---|---|---|---|---|---|
| | | Mean | Std. Deviation | Std. Error Mean | 95% Confidence Interval of the Difference Lower | Upper | | | |
| Pair 1 | Ukuran Partikel F2 Sblm - Ukuran Partikel F2 Stlh | 454.64400 | 48.79477 | 21.82168 | 394.05729 | 515.23071 | 20.835 | 4 | .000 |

## Lampiran 11. Hasil uji Wilcoxon Ukuran Partikel dan Polidispersitas

| | | N | Mean Rank | Sum of Ranks |
|---|---|---|---|---|
| Ukuran Partikel F1 Stlh - Ukuran Partikel F1 Sblm | Negative Ranks | 5[a] | 3.00 | 15.00 |
| | Positive Ranks | 0[b] | .00 | .00 |
| | Ties | 0[c] | | |
| | Total | 5 | | |
| Ukuran Partikel F3 Stlh - Ukuran Partikel F3 Sblm | Negative Ranks | 0[d] | .00 | .00 |
| | Positive Ranks | 5[e] | 3.00 | 15.00 |
| | Ties | 0[f] | | |
| | Total | 5 | | |

a. Ukuran Partikel F1 Stlh < Ukuran Partikel F1 Sblm
b. Ukuran Partikel F1 Stlh > Ukuran Partikel F1 Sblm
c. Ukuran Partikel F1 Stlh = Ukuran Partikel F1 Sblm
d. Ukuran Partikel F3 Stlh < Ukuran Partikel F3 Sblm
e. Ukuran Partikel F3 Stlh > Ukuran Partikel F3 Sblm
f. Ukuran Partikel F3 Stlh = Ukuran Partikel F3 Sblm

**Test Statistics[a]**

| | Ukuran Partikel F1 Stlh - Ukuran Partikel F1 Sblm | Ukuran Partikel F3 Stlh - Ukuran Partikel F3 Sblm |
|---|---|---|
| Z | -2.023[b] | -2.023[c] |
| Asymp. Sig. (2-tailed) | .043 | .043 |

a. Wilcoxon Signed Ranks Test
b. Based on positive ranks.
c. Based on negative ranks.

[DataSet2]

**Wilcoxon Signed Ranks Test**

**Ranks**

| | | N | Mean Rank | Sum of Ranks |
|---|---|---|---|---|
| Polidisersitas F1 Stlh - Polidisersitas F1 Sblm | Negative Ranks | 5[a] | 3.00 | 15.00 |
| | Positive Ranks | 0[b] | .00 | .00 |
| | Ties | 0[c] | | |
| | Total | 5 | | |

a. Polidisersitas F1 Stlh < Polidisersitas F1 Sblm

b. Polidisersitas F1 Stlh > Polidisersitas F1 Sblm

c. Polidisersitas F1 Stlh = Polidisersitas F1 Sblm

**Test Statistics[a]**

| | Polidisersitas F1 Stlh - Polidisersitas F1 Sblm |
|---|---|
| Z | -2.023[b] |
| Asymp. Sig. (2-tailed) | .043 |

a. Wilcoxon Signed Ranks Test

b. Based on positive ranks.

## Lampiran 12. Hasil uji zeta potensial nanosuspensi ekstrak biji kelor

**Zeta Potential Report**
*v2.3*

Malvern

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**Sample Details**

**Sample Name:** F3 1
**SOP Name:** mansettings.nano
**General Notes:**

**File Name:** Erwinda 2021.dts
**Record Number:** 46
**Date and Time:** 22 Juni 2021 15:03:19
**Dispersant Name:** Water
**Dispersant RI:** 1,330
**Viscosity (cP):** 0,8872
**Dispersant Dielectric Constant:** 78,5

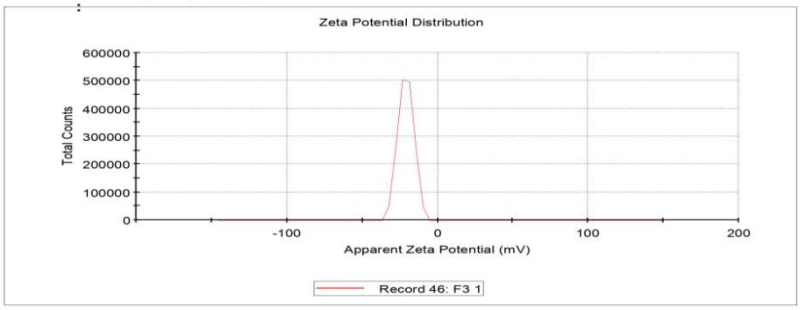
**System**

**Temperature (°C):** 25,0
**Count Rate (kcps):** 115,4
**Cell Description:** Zeta dip cell
**Zeta Runs:** 12
**Measurement Position (mm):** 4,50
**Attenuator:** 8

**Results**

| | | Mean (mV) | Area (%) | St Dev (mV) |
|---|---|---|---|---|
| **Zeta Potential (mV):** -21,0 | **Peak 1:** | -21,0 | 100,0 | 5,07 |
| **Zeta Deviation (mV):** 5,07 | **Peak 2:** | 0,00 | 0,0 | 0,00 |
| **Conductivity (mS/cm):** 0,234 | **Peak 3:** | 0,00 | 0,0 | 0,00 |

**Result quality :** Good



# Zeta Potential Report

*v2.3*

Malvern

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**Sample Details**

**Sample Name:** F3 1
**SOP Name:** mansettings.nano
**General Notes:**

**File Name:** Erwinda 2021.dts
**Record Number:** 46
**Date and Time:** 22 Juni 2021 15:03:19
**Dispersant Name:** Water
**Dispersant RI:** 1,330
**Viscosity (cP):** 0,8872
**Dispersant Dielectric Constant:** 78,5

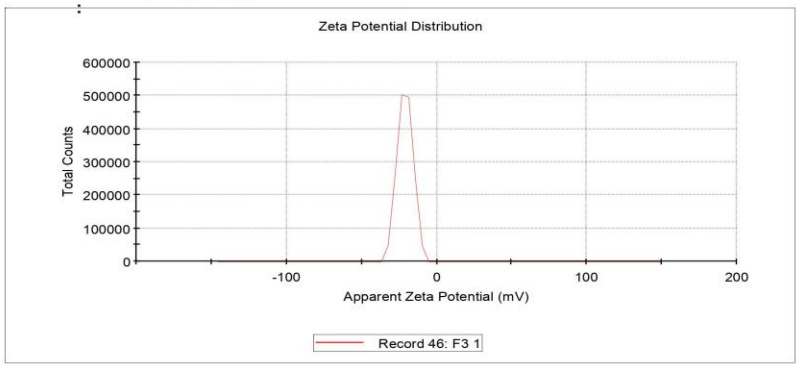
**System**

**Temperature (°C):** 25,0
**Count Rate (kcps):** 115,4
**Cell Description:** Zeta dip cell
**Zeta Runs:** 12
**Measurement Position (mm):** 4,50
**Attenuator:** 8

**Results**

| | | Mean (mV) | Area (%) | St Dev (mV) |
|---|---|---|---|---|
| **Zeta Potential (mV):** -21,0 | **Peak 1:** | -21,0 | 100,0 | 5,07 |
| **Zeta Deviation (mV):** 5,07 | **Peak 2:** | 0,00 | 0,0 | 0,00 |
| **Conductivity (mS/cm):** 0,234 | **Peak 3:** | 0,00 | 0,0 | 0,00 |

**Result quality :** Good






| Replikasi | Sebelum uji stabilitas | | | Sesudah uji stabilitas | | |
|---|---|---|---|---|---|---|
| | F1 | F2 | F3 | F1 | F2 | F3 |
| 1 | -9,1 | -14,8 | -12,8 | -5,71 | -5,48 | -21,0 |
| 2 | -9,44 | -14 | -16,4 | -6,37 | -5,09 | -23,4 |
| 3 | -10,6 | -14,1 | -16,0 | -6,08 | -4,63 | -22,5 |
| Rata-rata | -12,8 | -16,4 | -16,0 | -6,05 | -5,06 | -22,30 |
| SD | 0,78 | 0,43 | 1,97 | 0,33 | 0,42 | 1,21 |

## Lampiran 13. Hasil Uji Normalitas Zeta Potensial

### Sebelum uji stabilitas penyimpanan

**Tests of Normality**

| | | Kolmogorov-Smirnov[a] | | | Shapiro-Wilk | | |
|---|---|---|---|---|---|---|---|
| | Formula | Statistic | df | Sig. | Statistic | df | Sig. |
| Zeta Potensial | 1 | .303 | 3 | . | .909 | 3 | .416 |
| | 2 | .343 | 3 | . | .842 | 3 | .220 |
| | 3 | .349 | 3 | . | .832 | 3 | .194 |

a. Lilliefors Significance Correction

### Setelah uji stabilitas penyimpanan

**Tests of Normality**

| | | Kolmogorov-Smirnov[a] | | | Shapiro-Wilk | | |
|---|---|---|---|---|---|---|---|
| | Formula | Statistic | df | Sig. | Statistic | df | Sig. |
| Zeta Potensial | 1 | .199 | 3 | . | .995 | 3 | .867 |
| | 2 | .189 | 3 | . | .998 | 3 | .909 |
| | 3 | .232 | 3 | . | .980 | 3 | .726 |

a. Lilliefors Significance Correction

## Lampiran 14. Hasil uji Paired Simple T test Zeta Potensial

**T-Test**

**Paired Samples Statistics**

| | | Mean | N | Std. Deviation | Std. Error Mean |
|---|---|---|---|---|---|
| Pair 1 | Zeta Potensial F1 Sblm | -13.0267 | 9 | 2.73146 | .91049 |
| | Zeta Potensial F1 Stlh | -11.1400 | 9 | 8.40711 | 2.80237 |

**Paired Samples Correlations**

| | | N | Correlation | Sig. |
|---|---|---|---|---|
| Pair 1 | Zeta Potensial F1 Sblm & Zeta Potensial F1 Stlh | 9 | .548 | .127 |

**Paired Samples Test**

| | | Paired Differences | | | | | t | df | Sig. (2-tailed) |
|---|---|---|---|---|---|---|---|---|---|
| | | Mean | Std. Deviation | Std. Error Mean | 95% Confidence Interval of the Difference Lower | Upper | | | |
| Pair 1 | Zeta Potensial F1 Sblm - Zeta Potensial F1 Stlh | -1.88667 | 7.27782 | 2.42594 | -7.48089 | 3.70756 | -.778 | 8 | .459 |

**Lampiran 15. Hasil dan perhitungan viskositas sediaan nanosuspensi ekstrak biji kelor.**

**Sebelum uji stabilitas penyimpanan**

| Sampel | Pikno 0 (g) | Pikno 1 (g) | Volume pikno (ml) | Massa jenis (g/ml) |
|---|---|---|---|---|
| **Air** | 13,588 | 22,688 | 10 | 0,910 |
| **F1** | 13,595 | 22,175 | 10 | 0,858 |
| **F2** | 13,593 | 22,184 | 10 | 0,859 |
| **F3** | 13,599 | 22,173 | 10 | 0,857 |

**Perhitungan massa jenis**

$$\textbf{Massa jeniss} = \frac{\textbf{Pikno dengan larutan} - \textbf{Pikno kosong}}{\textbf{Volume Pikno}}$$

Air $= \frac{22,688 - 13,588}{10}$

$= 0,910$

F1 $= \frac{22,175 - 13,595}{10}$

$= 0,858$

F2 $= \frac{22,184 - 13,593}{10}$

$= 0,859$

F3 $= \frac{22,173 - 13,599}{10}$

$= 0,857$

| Sampel | Waktu (s) | | | Viskositas (cPs) | | | Rata-rata |
|---|---|---|---|---|---|---|---|
| | 1 | 2 | 3 | 1 | 2 | 3 | |
| **Air** | 0,85 | 0,89 | 0,85 | 0,89 | | | 0,89 |
| **F1** | 1,71 | 1,49 | 1,11 | 1,2 | 1,1 | 0,8 | 1,0 |
| **F2** | 1,04 | 0,95 | 0,98 | 0,7 | 0,8 | 0,7 | 0,7 |
| **F3** | 1,01 | 0,91 | 1,07 | 0,7 | 0,6 | 0,8 | 0,7 |

**Perhitungan viskositas**

**Diketahui viskositas air = 0,89 cPs**

$$\textbf{Ŋ sampel} = \text{Ŋ air x } \frac{\textbf{ρ sampel x t sampel}}{\textbf{ρ air x t air}}$$

**Replikasi 1**

F1 $= 0,89\ X\ \frac{0,858\ X\ 1,71}{0,910\ X\ 0,85}$

$= 1,2$

F2 $= 0,89\ X\ \frac{0,859\ X\ 1,04}{0,910\ X\ 0,85}$

$= 07$

F3 $= 0,89\ X\ \frac{0,857\ X\ 1,01}{0,910\ X\ 0,85}$

$= 0,7$

**Replikasi 2**

F1 $= 0{,}89\ X\ \frac{0{,}858\ X\ 1{,}49}{0{,}910\ X\ 0{,}89}$

$= 1{,}1$

F2 $= 0{,}89\ X\ \frac{0{,}859\ X\ 0{,}95}{0{,}910\ X\ 0{,}89}$

$= 0{,}7$

F3 $= 0{,}89\ X\ \frac{0{,}857\ X\ 0{,}91}{0{,}910\ X\ 0{,}89}$

$= 0{,}6$

**Replikasi 3**

F1 $= 0{,}89\ X\ \frac{0{,}858\ X\ 1{,}11}{0{,}910\ X\ 0{,}85}$

$= 0{,}8$

F2 $= 0{,}89\ X\ \frac{0{,}859\ X\ 0{,}98}{0{,}910\ X\ 0{,}85}$

$= 0{,}7$

F3 $= 0{,}89\ X\ \frac{0{,}857\ X\ 1{,}07}{0{,}910\ X\ 0{,}85}$

$= 0{,}8$

**Sesudah uji stabilitas penyimpanan**

| Sampel | Pikno 0 (g) | Pikno 1 (g) | Volume pikno (ml) | Massa jenis (g/ml) |
|---|---|---|---|---|
| **Air** | 13,577 | 22,777 | 10 | 0,920 |
| **F1** | 13,599 | 22,299 | 10 | 0,870 |
| **F2** | 13,601 | 22,101 | 10 | 0,850 |
| **F3** | 13,596 | 22,204 | 10 | 0,861 |

**Perhitungan massa jenis**

Massa jeniss $= \frac{\text{Pikno dengan larutan} - \text{Pikno kosong}}{\text{Volume Pikno}}$

Air $= \frac{22{,}777 - 13{,}577}{10}$

$= 0{,}920$

F1 $= \frac{22{,}299 - 13{,}599}{10}$

$= 0{,}870$

F2 $= \frac{22{,}101 - 13{,}601}{10}$

$= 0{,}850$

F3 $= \frac{22{,}204 - 13{,}596}{10}$

$= 0{,}861$

| Sampel | Waktu (s) | | | Viskositas (cPs) | | | Rata-rata |
|---|---|---|---|---|---|---|---|
| | 1 | 2 | 3 | 1 | 2 | 3 | |
| **Air** | 0,88 | 0,92 | 0,86 | 0,89 | | | 0,89 |
| **F1** | 1,74 | 1,51 | 1,14 | 1,3 | 1,2 | 0,8 | 1,1 |
| **F2** | 1,05 | 0,97 | 1,02 | 0,8 | 0,7 | 0,7 | 0,7 |
| **F3** | 1,03 | 0,94 | 1,11 | 0,8 | 0,7 | 0,8 | 0,8 |

**Perhitungan viskositas**

**Diketahui viskositas air = 0,89 cPs**

$$\text{Ŋ sampel} = \text{Ŋ air x } \frac{\text{ρ sampel x t sampel}}{\text{ρ air x t air}}$$

**Replikasi 1**

$$\text{F1} = 0{,}89\ X\ \frac{0{,}870\ X\ 1{,}74}{0{,}920\ X\ 0{,}88}$$
$$= 1{,}3$$
$$\text{F2} = 0{,}89\ X\ \frac{0{,}850\ X\ 1{,}05}{0{,}920\ X\ 0{,}88}$$
$$= 0{,}8$$
$$\text{F3} = 0{,}89\ X\ \frac{0{,}861\ X\ 1{,}03}{0{,}920\ X\ 0{,}88}$$
$$= 0{,}8$$

**Replikasi 2**

$$\text{F1} = 0{,}89\ X\ \frac{0{,}870\ X\ 1{,}51}{0{,}920\ X\ 0{,}92}$$
$$= 1{,}2$$
$$\text{F2} = 0{,}89\ X\ \frac{0{,}850\ X\ 0{,}97}{0{,}920\ X\ 0{,}92}$$
$$= 0{,}7$$
$$\text{F3} = 0{,}89\ X\ \frac{0{,}861\ X\ 0{,}94}{0{,}920\ X\ 0{,}92}$$
$$= 0{,}7$$

**Replikasi 3**

$$\text{F1} = 0{,}89\ X\ \frac{0{,}870\ X\ 1{,}14}{0{,}910\ X\ 0{,}86}$$
$$= 0{,}8$$
$$\text{F2} = 0{,}89\ X\ \frac{0{,}850\ X\ 1{,}02}{0{,}910\ X\ 0{,}86}$$
$$= 0{,}7$$
$$\text{F3} = 0{,}89\ X\ \frac{0{,}861\ X\ 1{,}11}{0{,}910\ X\ 0{,}86}$$
$$= 0{,}8$$

## Lampiran 16. Hasil Uji Normalitas Viskositas

### Sebelum uji stabilitas penyimpanan

**Tests of Normality**

| | | Kolmogorov-Smirnov[a] | | | Shapiro-Wilk | | |
|---|---|---|---|---|---|---|---|
| | Formula | Statistic | df | Sig. | Statistic | df | Sig. |
| Viskositas | 1 | .292 | 3 | . | .923 | 3 | .463 |
| | 2 | .385 | 3 | . | .750 | 3 | .000 |
| | 3 | .175 | 3 | . | 1.000 | 3 | 1.000 |

a. Lilliefors Significance Correction

### Setelah uji stabilitas penyimpanan

**Tests of Normality**

| | | Kolmogorov-Smirnov[a] | | | Shapiro-Wilk | | |
|---|---|---|---|---|---|---|---|
| | Formula | Statistic | df | Sig. | Statistic | df | Sig. |
| Viskositas | 1 | .314 | 3 | . | .893 | 3 | .363 |
| | 2 | .385 | 3 | . | .750 | 3 | .000 |
| | 3 | .385 | 3 | . | .750 | 3 | .000 |

a. Lilliefors Significance Correction

## Lampiran 17. Hasil uji Paired Sampel T test Viskositas

**Paired Samples Statistics**

| | | Mean | N | Std. Deviation | Std. Error Mean |
|---|---|---|---|---|---|
| Pair 1 | Viskositas F1 Sblm | 1.033 | 3 | .2082 | .1202 |
| | Viskositas F1 Stlh | 1.100 | 3 | .2646 | .1528 |

**Paired Samples Correlations**

| | | N | Correlation | Sig. |
|---|---|---|---|---|
| Pair 1 | Viskositas F1 Sblm & Viskositas F1 Stlh | 3 | .999 | .033 |

**Paired Samples Test**

| | | Paired Differences | | | | | t | df | Sig. (2-tailed) |
|---|---|---|---|---|---|---|---|---|---|
| | | Mean | Std. Deviation | Std. Error Mean | 95% Confidence Interval of the Difference Lower | Upper | | | |
| Pair 1 | Viskositas F1 Sblm - Viskositas F1 Stlh | -.0667 | .0577 | .0333 | -.2101 | .0768 | -2.000 | 2 | .184 |

## Lampiran 18. Hasil uji Wilcoxon Viskositas

| | | N | Mean Rank | Sum of Ranks |
|---|---|---|---|---|
| Viskositas F2 Stlh - Viskositasl F2 Sblm | Negative Ranks | 1[a] | 1.50 | 1.50 |
| | Positive Ranks | 1[b] | 1.50 | 1.50 |
| | Ties | 1[c] | | |
| | Total | 3 | | |
| Viskositasl F3 Stlh - Viskositasl F3 Sblm | Negative Ranks | 0[d] | .00 | .00 |
| | Positive Ranks | 2[e] | 1.50 | 3.00 |
| | Ties | 1[f] | | |
| | Total | 3 | | |

a. Viskositas F2 Stlh < Viskositasl F2 Sblm
b. Viskositas F2 Stlh > Viskositasl F2 Sblm
c. Viskositas F2 Stlh = Viskositasl F2 Sblm
d. Viskositasl F3 Stlh < Viskositasl F3 Sblm
e. Viskositasl F3 Stlh > Viskositasl F3 Sblm
f. Viskositasl F3 Stlh = Viskositasl F3 Sblm

**Test Statistics[a]**

| | Viskositas F2 Stlh - Viskositasl F2 Sblm | Viskositasl F3 Stlh - Viskositasl F3 Sblm |
|---|---|---|
| Z | .000[b] | -1.414[c] |
| Asymp. Sig. (2-tailed) | 1.000 | .157 |

a. Wilcoxon Signed Ranks Test
b. The sum of negative ranks equals the sum of positive ranks.
c. Based on negative ranks.

## Lampiran 19. Hasil uji pH


## Lampiran 20. Perhitungan larutan induk DPPH 0,4 mM

Serbuk DPPH untuk uji aktivitas antioksidan ditimbang sesuai perhitungan sebagai berikut:

0,4 mM = 0,0004 M
BM DPPH = 394,32 g/mol
Volume = 100 ml

$$\textit{Molaritas}\ (\text{M}) = \frac{\text{bobot (g) x 1000}}{\text{BM DPPH x volume}}$$

$$0{,}0004 = \frac{\text{b x 1000}}{394{,}32 \text{ x } 100}$$

$$\text{b} = 0{,}0157728 \text{ g}$$

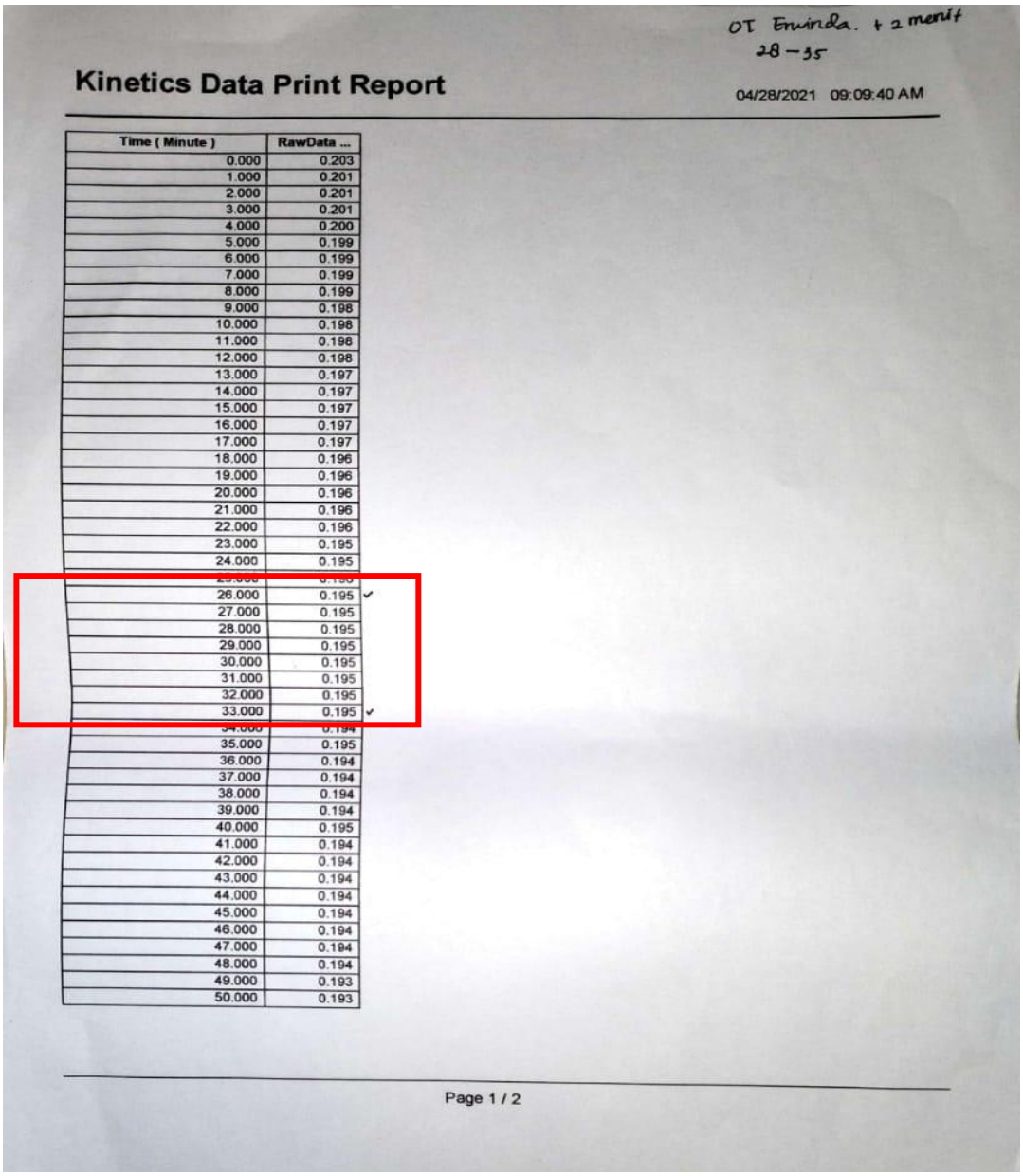
$= 15{,}772$ mg

**Pembuatan larutan DPPH**

Serbuk DPPH ditimbang sebanyak 15,8 mg kemudian dilarutkan dengan etanol p.a sampai tanda batas labu takar 100 ml. Kemudian dibaca absorbansi larutan DPPH.

**Lampiran 21. Penentuan *Operating time***

**Hasil *Operating time* ekstrak biji kelor**



OT Erwinda. + 2 menit
28 – 35

**Kinetics Data Print Report**

04/28/2021 09:09:40 AM

| Time ( Minute ) | RawData ... |
|---|---|
| 0.000 | 0.203 |
| 1.000 | 0.201 |
| 2.000 | 0.201 |
| 3.000 | 0.201 |
| 4.000 | 0.200 |
| 5.000 | 0.199 |
| 6.000 | 0.199 |
| 7.000 | 0.199 |
| 8.000 | 0.199 |
| 9.000 | 0.198 |
| 10.000 | 0.198 |
| 11.000 | 0.198 |
| 12.000 | 0.198 |
| 13.000 | 0.197 |
| 14.000 | 0.197 |
| 15.000 | 0.197 |
| 16.000 | 0.197 |
| 17.000 | 0.197 |
| 18.000 | 0.196 |
| 19.000 | 0.196 |
| 20.000 | 0.196 |
| 21.000 | 0.196 |
| 22.000 | 0.196 |
| 23.000 | 0.195 |
| 24.000 | 0.195 |
| 26.000 | 0.195 |
| 27.000 | 0.195 |
| 28.000 | 0.195 |
| 29.000 | 0.195 |
| 30.000 | 0.195 |
| 31.000 | 0.195 |
| 32.000 | 0.195 |
| 33.000 | 0.195 |
| 35.000 | 0.195 |
| 36.000 | 0.194 |
| 37.000 | 0.194 |
| 38.000 | 0.194 |
| 39.000 | 0.194 |
| 40.000 | 0.195 |
| 41.000 | 0.194 |
| 42.000 | 0.194 |
| 43.000 | 0.194 |
| 44.000 | 0.194 |
| 45.000 | 0.194 |
| 46.000 | 0.194 |
| 47.000 | 0.194 |
| 48.000 | 0.194 |
| 49.000 | 0.193 |
| 50.000 | 0.193 |

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## Kinetics Data Print Report

04/28/2021 09:09:40 AM

| Time ( Minute ) | RawData ... |
|---|---|
| 51.000 | 0.193 |
| 52.000 | 0.193 |
| 53.000 | 0.193 |
| 54.000 | 0.193 |
| 55.000 | 0.193 |
| 56.000 | 0.194 |
| 57.000 | 0.193 |
| 58.000 | 0.193 |
| 59.000 | 0.193 |
| 60.000 | 0.193 |

**Hasil *Operating time* formula 1**

## Kinetics Data Print Report

(39 - 13) +5' = 41-48

06/10/2021 10:56:40 AM

| Time ( Minute ) | RawData ... | RawData ... |
|---|---|---|
| 0.000 | 0.448 | 0.433 |
| 1.000 | | 0.431 |
| 2.000 | | 0.429 |
| 3.000 | | 0.427 |
| 4.000 | | 0.425 |
| 5.000 | | 0.424 |
| 6.000 | | 0.423 |
| 7.000 | | 0.422 |
| 8.000 | | 0.421 |
| 9.000 | | 0.420 |
| 10.000 | | 0.420 |
| 11.000 | | 0.419 |
| 12.000 | | 0.418 |
| 13.000 | | 0.417 |
| 14.000 | | 0.417 |
| 15.000 | | 0.417 |
| 16.000 | | 0.416 |
| 17.000 | | 0.417 |
| 18.000 | | 0.417 |
| 19.000 | | 0.417 |
| 20.000 | | 0.417 |
| 21.000 | | 0.416 |
| 22.000 | | 0.416 |
| 23.000 | | 0.415 |
| 24.000 | | 0.415 |
| 25.000 | | 0.415 |
| 26.000 | | 0.415 |
| 27.000 | | 0.414 |
| 28.000 | | 0.414 |
| 29.000 | | 0.413 |
| 30.000 | | 0.413 |
| 31.000 | | 0.412 |
| 32.000 | | 0.411 |
| 33.000 | | 0.411 |
| 34.000 | | 0.411 |
| 35.000 | | 0.411 |
| 36.000 | | 0.410 |
| 37.000 | | 0.410 |
| 38.000 | | 0.409 |
| 39.000 | | 0.408 |
| 40.000 | | 0.408 |
| 41.000 | | 0.408 |
| 42.000 | | 0.408 |
| 43.000 | | 0.408 |
| 44.000 | | 0.407 |
| 45.000 | | 0.406 |
| 46.000 | | 0.406 |
| 47.000 | | 0.406 |
| 48.000 | | 0.405 |
| 49.000 | | 0.405 |
| 50.000 | | 0.405 |

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CS Dipindai dengan CamScanner

## Kinetics Data Print Report

06/10/2021 10:56:40 AM

| Time ( Minute ) | RawData ... | RawData ... |
|---|---|---|
| 51.000 | | 0.404 |
| 52.000 | | 0.404 |
| 53.000 | | 0.404 |
| 54.000 | | 0.403 |
| 55.000 | | 0.403 |
| 56.000 | | 0.402 |
| 57.000 | | 0.402 |
| 58.000 | | 0.402 |
| 59.000 | | 0.402 |
| 60.000 | | 0.401 |

**Hasil *Operating time* formula 2**

## Kinetics Data Print Report

(52-54) +2' ·54-56

06/11/2021 11:16:36 AM

| Time ( Minute ) | RawData ... |
|---|---|
| 0.000 | 0.438 |
| 1.000 | 0.431 |
| 2.000 | 0.424 |
| 3.000 | 0.419 |
| 4.000 | 0.410 |
| 5.000 | 0.406 |
| 6.000 | 0.403 |
| 7.000 | 0.399 |
| 8.000 | 0.396 |
| 9.000 | 0.393 |
| 10.000 | 0.390 |
| 11.000 | 0.388 |
| 12.000 | 0.386 |
| 13.000 | 0.384 |
| 14.000 | 0.382 |
| 15.000 | 0.381 |
| 16.000 | 0.379 |
| 17.000 | 0.378 |
| 18.000 | 0.376 |
| 19.000 | 0.375 |
| 20.000 | 0.374 |
| 21.000 | 0.373 |
| 22.000 | 0.371 |
| 23.000 | 0.371 |
| 24.000 | 0.370 |
| 25.000 | 0.369 |
| 26.000 | 0.368 |
| 27.000 | 0.367 |
| 28.000 | 0.366 |
| 29.000 | 0.365 |
| 30.000 | 0.364 |
| 31.000 | 0.363 |
| 32.000 | 0.363 |
| 33.000 | 0.362 |
| 34.000 | 0.361 |
| 35.000 | 0.361 |
| 36.000 | 0.359 |
| 37.000 | 0.358 |
| 38.000 | 0.358 |
| 39.000 | 0.356 |
| 40.000 | 0.355 |
| 41.000 | 0.354 |
| 42.000 | 0.354 |
| 43.000 | 0.353 |
| 44.000 | 0.352 |
| 45.000 | 0.351 |
| 46.000 | 0.351 |
| 47.000 | 0.350 |
| 48.000 | 0.349 |
| 49.000 | 0.348 |
| 50.000 | 0.348 |

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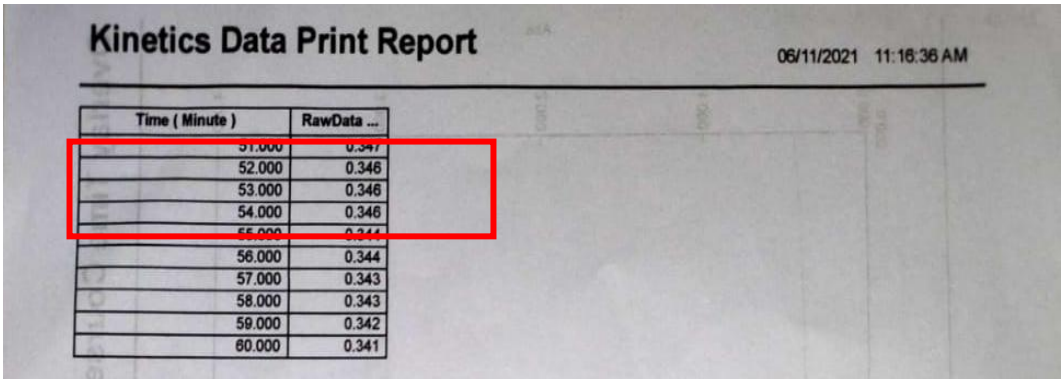
CS Dipindai dengan CamScanner



Kinetics Data Print Report

06/11/2021 11:16:36 AM

| Time ( Minute ) | RawData ... |
|---|---|
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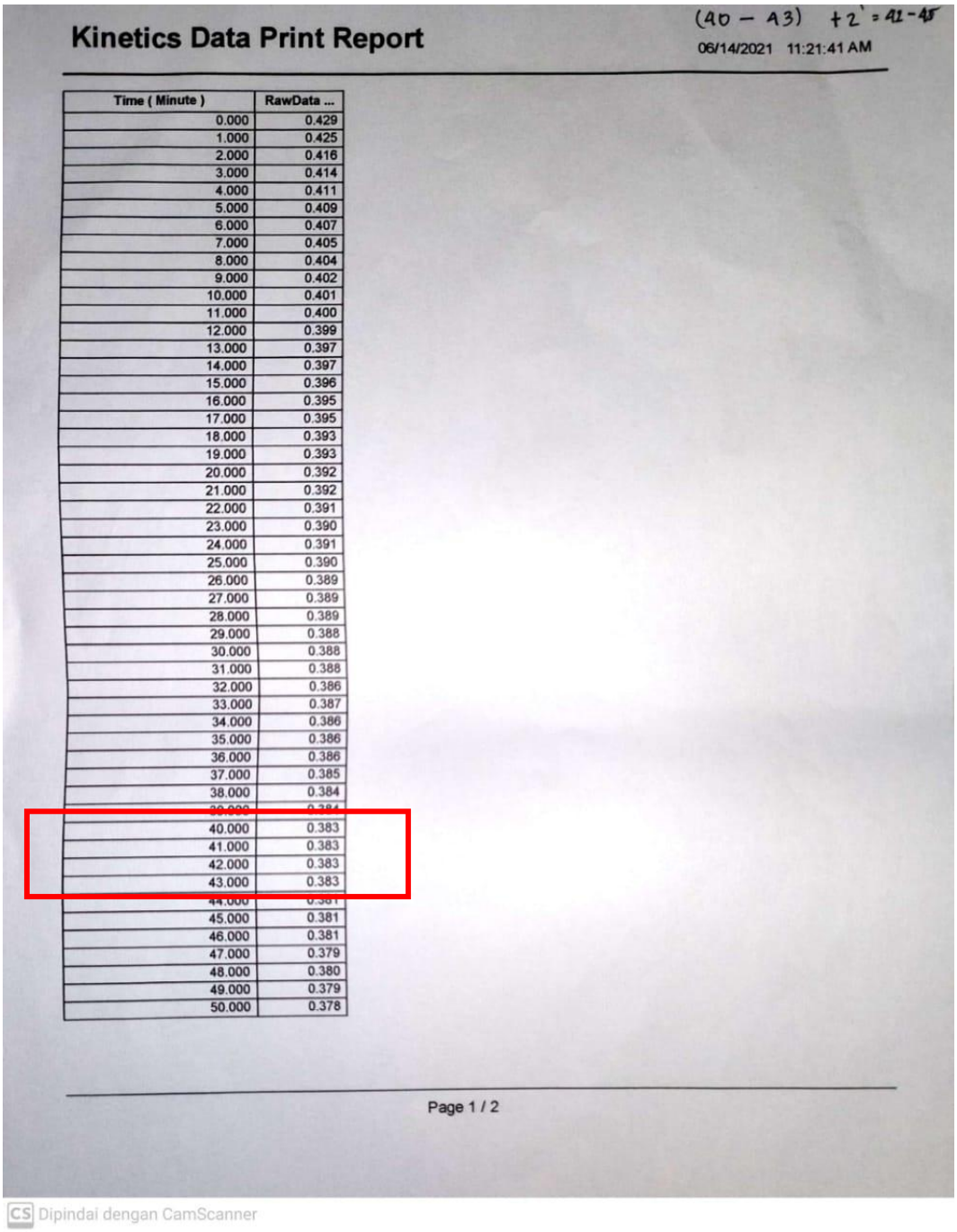
| 52.000 | 0.346 |
| 53.000 | 0.346 |
| 54.000 | 0.346 |
| 55.000 | 0.344 |
| 56.000 | 0.344 |
| 57.000 | 0.343 |
| 58.000 | 0.343 |
| 59.000 | 0.342 |
| 60.000 | 0.341 |

**Hasil *Operating time* formula 3**



Kinetics Data Print Report

(40 − 43) +2 = 41-45

06/14/2021 11:21:41 AM

| Time ( Minute ) | RawData ... |
|---|---|
| 0.000 | 0.429 |
| 1.000 | 0.425 |
| 2.000 | 0.416 |
| 3.000 | 0.414 |
| 4.000 | 0.411 |
| 5.000 | 0.409 |
| 6.000 | 0.407 |
| 7.000 | 0.405 |
| 8.000 | 0.404 |
| 9.000 | 0.402 |
| 10.000 | 0.401 |
| 11.000 | 0.400 |
| 12.000 | 0.399 |
| 13.000 | 0.397 |
| 14.000 | 0.397 |
| 15.000 | 0.396 |
| 16.000 | 0.395 |
| 17.000 | 0.395 |
| 18.000 | 0.393 |
| 19.000 | 0.393 |
| 20.000 | 0.392 |
| 21.000 | 0.392 |
| 22.000 | 0.391 |
| 23.000 | 0.390 |
| 24.000 | 0.391 |
| 25.000 | 0.390 |
| 26.000 | 0.389 |
| 27.000 | 0.389 |
| 28.000 | 0.389 |
| 29.000 | 0.388 |
| 30.000 | 0.388 |
| 31.000 | 0.388 |
| 32.000 | 0.386 |
| 33.000 | 0.387 |
| 34.000 | 0.386 |
| 35.000 | 0.386 |
| 36.000 | 0.386 |
| 37.000 | 0.385 |
| 38.000 | 0.384 |
| 39.000 | 0.384 |
| 40.000 | 0.383 |
| 41.000 | 0.383 |
| 42.000 | 0.383 |
| 43.000 | 0.383 |
| 44.000 | 0.381 |
| 45.000 | 0.381 |
| 46.000 | 0.381 |
| 47.000 | 0.379 |
| 48.000 | 0.380 |
| 49.000 | 0.379 |
| 50.000 | 0.378 |

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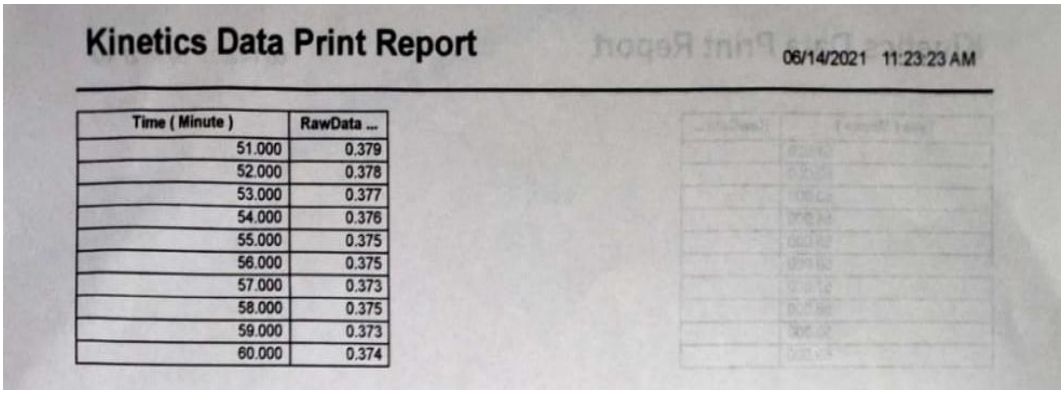
Dipindai dengan CamScanner



Kinetics Data Print Report

06/14/2021 11:23:23 AM

| Time ( Minute ) | RawData ... |
|---|---|
| 51.000 | 0.379 |
| 52.000 | 0.378 |
| 53.000 | 0.377 |
| 54.000 | 0.376 |
| 55.000 | 0.375 |
| 56.000 | 0.375 |
| 57.000 | 0.373 |
| 58.000 | 0.375 |
| 59.000 | 0.373 |
| 60.000 | 0.374 |

**Lampiran 22. Data perhitungan pembuatan larutan stok ekstrak dan hasil uji aktivitas antioksidan**

Pembuatan larutan stok esktrak biji kelor dengan menimbang 100 mg yang dimasukkan dalam labu takar dan ditambahkan etanol p.a sampai tanda batas labu takar 100 ml, sehingga diperoleh konsentrasi 1000 ppm.

Konsentrasi ekstrak biji kelor =100 mg/ 100ml

= 1000 mg/ 1000 ml

= 1000 ppm

Larutan stok 1000 ppm kemudian dibuat 6 seri pengenceran yaitu 300 ppm, 150 ppm, 100 ppm, 80 ppm, 60 ppm dan 40 ppm sebanyak 10 ml.

**Konsentrasi 300 ppm**

V1 x C1 = V2 x C2

V1 x 1000 ppm = 10 ml x 300 ppm

V1 = 3 ml

**Konsentrasi 150 ppm**

V1 x C1 = V2 x C2

V1 x 1000 ppm = 10 ml x 150 ppm

V1 = 1,5 ml

**Konsentrasi 100 ppm**

V1 x C1 = V2 x C2

V1 x 1000 ppm = 10 ml x 100 ppm

V1 = 1 ml

**Konsentrasi 80 ppm**

V1 x C1 = V2 x C2

V1 x 1000 ppm = 10 ml x 80 ppm

V1 = 0,8 ml

**Konsentrasi 60 ppm**

V1 x C1 = V2 x C2

V1 x 1000 ppm = 10 ml x 60 ppm

V1 = 0,6 ml

**Konsentrasi 40 ppm**

V1 x C1 = V2 x C2

V1 x 1000 ppm = 10 ml x 40 ppm

V1 = 0,4 ml

**Perhitungan hasil pengujian aktivitas antioksidan ekstrak biji kelor**

$$\textbf{\% Inhibisi} = \frac{\textbf{absorbansi DPPH} - \textbf{absorbansi sampel}}{\textbf{absorbansi DPPH}} \textbf{x } 100\%$$

| Replikasi | Konsentrasi (ppm) | Abs DPPH | Abs sampel |
|---|---|---|---|
| 1 | 40 | 0,753 | 0,745 |
| | 60 | | 0,712 |
| | 80 | | 0,685 |
| | 100 | | 0,652 |
| | 150 | | 0,565 |
| | 300 | | 0,289 |
| 2 | 40 | | 0,739 |
| | 60 | | 0,707 |
| | 80 | | 0,687 |
| | 100 | | 0,651 |
| | 150 | | 0,562 |
| | 300 | | 0,285 |
| 3 | 40 | | 0,742 |
| | 60 | | 0,702 |
| | 80 | | 0,686 |
| | 100 | | 0,654 |
| | 150 | | 0,559 |
| | 300 | | 0,287 |

**Perhitungan $IC_{50}$ ekstak biji kelor**

Y = a+bx

X = nilai $IC_{50}$

**Replikasi 1**

$$50 = -9{,}242 + 0{,}234x$$

$$x = \frac{50-(-9,242)}{0,234}$$

$$x = 252,91$$

**Replikasi 2**

$$50 = -8,888 + 0,234x$$

$$x = \frac{50—(-8,888)}{0,234}$$

$$x = 251,21$$

**Replikasi 3**

$$50 = -8,755 + 0,234x$$

$$x = \frac{50-(-8,755)}{0,234}$$

$$x = 252,91$$

| Konsentrasi (ppm) | Replikasi | % inhibisi | Regresi linier (a, b, r) | $IC_{50}$ | Rata-rata | SD |
|---|---|---|---|---|---|---|
| 40 | 1 | 1,062 | a = -9,242<br>b = 0,234<br>r = 0,999 | 252,919 | 251,918 | 0,890 |
| 60 | 1 | 5,445 | | | | |
| 80 | 1 | 9,031 | | | | |
| 100 | 1 | 13,413 | | | | |
| 150 | 1 | 24,967 | | | | |
| 300 | 1 | 61,620 | | | | |
| 40 | 2 | 1,859 | a = -8,888<br>b = 0,234<br>r = -0,999 | 251,212 | | |
| 60 | 2 | 6,109 | | | | |
| 80 | 2 | 8,765 | | | | |
| 100 | 2 | 13,546 | | | | |
| 150 | 2 | 25,365 | | | | |
| 300 | 2 | 62,151 | | | | |
| 40 | 3 | 1,461 | a = -8,755<br>b = 0,234<br>r = 0,999 | 251,624 | | |
| 60 | 3 | 6,773 | | | | |
| 80 | 3 | 8,898 | | | | |
| 100 | 3 | 13,147 | | | | |
| 150 | 3 | 25,764 | | | | |
| 300 | 3 | 61,886 | | | | |

**Lampiran 23. Data perhitungan pembuatan larutan stok nanosuspensi dan hasil uji antioksidan**

Sediaan nanosuspensi dibuat dengan melarutkan 100 mg ekstrak biji kelor dan dilarutkan dalam 30 ml pelarut etanol dan penstabil sehingga diketahui sediaan nanosuspensi memiliki konsentrasi sebesar 100 mg / 30 ml.

Konsentrasi nanosuspensi =100 mg/ 30ml

= 3.333,3 mg / 1000 ml

= 3.333,3 ppm

Larutan stok nanosuspensi untuk uji aktivitas sediaan dibuat konsentrasi 500 ppm dalam 50 ml dengan melakukan pengenceran dari sediaan nanosuspensi.

Konsentrasi 500 ppm :

V1 x C1 = V2 x C2

V1 x 3.333,3 ppm = 500 ppm x 50 ml

V1 = 7,5 ml

Larutan stok 500 ppm diencerkan menjadi 6 seri pengenceran kemudian dibuat 6 seri pengenceran yaitu 250 ppm, 100 ppm, 80 ppm, 60 ppm, 40 ppm dan 20 ppm sebanyak 10 ml.

**Konsentrasi 250 ppm**

V1 x C1 = V2 x C2

V1 x 500 ppm = 10 ml x 250 ppm

V1 = 5 ml

**Konsentrasi 100 ppm**

V1 x C1 = V2 x C2

V1 x 500 ppm = 10 ml x 100 ppm

V1 = 2 ml

**Konsentrasi 80 ppm**

V1 x C1 = V2 x C2

V1 x 500 ppm = 10 ml x 80 ppm

V1 = 1,6 ml

**Konsentrasi 60 ppm**

V1 x C1 = V2 x C2

V1 x 500 ppm = 10 ml x 60 ppm

V1 = 1,2 ml

**Konsentrasi 40 ppm**

V1 x C1 = V2 x C2

V1 x 500 ppm = 10 ml x 40 ppm

V1 = 0,8 ml

**Konsentrasi 20 ppm**

V1 x C1 = V2 x C2

V1 x 500 ppm = 10 ml x 20 ppm

V1 = 0,4 ml

**Perhitungan hasil pengujian aktivitas antioksidan ekstrak biji kelor**

$$\textbf{\% Inhibisi} = \frac{\textbf{absorbansi DPPH} - \textbf{absorbansi sampel}}{\textbf{absorbansi DPPH}} \textbf{ x 100}\%$$

**Formula 1**

| Replikasi | Konsentrasi (ppm) | Abs DPPH | Abs sampel |
|---|---|---|---|
| 1 | 20 | 0,751 | 0,709 |
| | 40 | | 0,674 |
| | 60 | | 0,635 |
| | 80 | | 0,608 |
| | 100 | | 0,573 |
| | 250 | | 0,347 |
| 2 | 20 | | 0,711 |
| | 40 | | 0,673 |
| | 60 | | 0,637 |
| | 80 | | 0,605 |
| | 100 | | 0,574 |
| | 250 | | 0,346 |
| 3 | 20 | | 0,710 |
| | 40 | | 0,672 |
| | 60 | | 0,637 |
| | 80 | | 0,607 |
| | 100 | | 0,573 |
| | 250 | | 0,349 |

**Perhitungan $IC_{50}$ ekstak biji kelor**

Y = a+bx

X = nilai $IC_{50}$

**Replikasi 1**

$$50 = 2{,}282 + 0{,}208x$$

$$x = \frac{50 - 2{,}282}{0{,}208}$$

$$x = 229{,}938$$

**Replikasi 2**

$$50 = 2{,}185 + 0{,}209x$$

$$x = \frac{50-2{,}185}{0{,}209}$$

$$x = 229{,}238$$

**Replikasi 3**

$$50 = 2{,}343 + 0{,}206x$$

$$x = \frac{50-2{,}343}{0{,}206}$$

$$x = 230{,}929$$

| Konsentrasi (ppm) | Replikasi | % inhibisi | Regresi linier (a, b, r) | $IC_{50}$ | Rata-rata | SD |
|---|---|---|---|---|---|---|
| 20 | 1 | 5,593 | a = 2,282<br>b = 0,208<br>r = 0,999 | 229,938 | 230,035 | 0,850 |
| 40 | 1 | 10,253 | | | | |
| 60 | 1 | 15,446 | | | | |
| 80 | 1 | 19,041 | | | | |
| 100 | 1 | 23,702 | | | | |
| 250 | 1 | 53,795 | | | | |
| 20 | 2 | 5,326 | a = 2,185<br>b = 0,209<br>r = -0,999 | 229,238 | | |
| 40 | 2 | 10,386 | | | | |
| 60 | 2 | 15,180 | | | | |
| 80 | 2 | 19,441 | | | | |
| 100 | 2 | 23,569 | | | | |
| 250 | 2 | 53,928 | | | | |
| 20 | 3 | 5,459 | a = 2,343<br>b = 0,206<br>r = 0,999 | 230,929 | | |
| 40 | 3 | 10,519 | | | | |
| 60 | 3 | 15,180 | | | | |
| 80 | 3 | 19,174 | | | | |
| 100 | 3 | 23,702 | | | | |
| 250 | 3 | 53,529 | | | | |

**Formula 2**

| Replikasi | Konsentrasi (ppm) | Abs DPPH | Abs sampel |
|---|---|---|---|
| 1 | 20 | 0,732 | 0,711 |
| | 40 | | 0,674 |
| | 60 | | 0,634 |
| | 80 | | 0,603 |
| | 100 | | 0,576 |
| | 250 | | 0,349 |
| 2 | 20 | | 0,709 |
| | 40 | | 0,675 |
| | 60 | | 0,636 |
| | 80 | | 0,602 |
| | 100 | | 0,575 |
| | 250 | | 0,348 |
| 3 | 20 | | 0,709 |
| | 40 | | 0,675 |
| | 60 | | 0,633 |
| | 80 | | 0,603 |
| | 100 | | 0,576 |
| | 250 | | 0,346 |

**Perhitungan $IC_{50}$ ekstak biji kelor**

Y = a+bx

X = nilai $IC_{50}$

**Replikasi 1**

$$50 = -0{,}172 + 0{,}172x$$

$$x = \frac{50-(-0{,}172)}{0{,}212}$$

$$x = 236{,}367$$

**Replikasi 2**

$$50 = -0{,}173 + 0{,}212x$$

$$x = \frac{50-(-0{,}172)}{0{,}212}$$

$$x = 236{,}367$$

**Replikasi 3**

$$50 = -0{,}187 + 0{,}213x$$

$$x = \frac{50-(-0{,}187)}{0{,}213}$$

$$x = 235{,}434$$

| Konsentrasi (ppm) | Replikasi | % inhibisi | Regresi linier (a, b, r) | $IC_{50}$ | Rata-rata | SD |
|---|---|---|---|---|---|---|
| 20 | 1 | 2,869 | a = -0172<br>b = 0,212<br>r = 0,999 | 236,929 | 236,243 | 0,755 |
| 40 | 1 | 7,923 | | | | |
| 60 | 1 | 13,388 | | | | |
| 80 | 1 | 17,623 | | | | |
| 100 | 1 | 21,311 | | | | |
| 250 | 1 | 52,322 | | | | |
| 20 | 2 | 3,142 | a = -0,173<br>b = 0,212<br>r = -0,999 | 236,367 | | |
| 40 | 2 | 7,787 | | | | |
| 60 | 2 | 13,115 | | | | |
| 80 | 2 | 17,760 | | | | |
| 100 | 2 | 21,448 | | | | |
| 250 | 2 | 52,459 | | | | |
| 20 | 3 | 3,142 | a = -0,187<br>b = 0,213<br>r = 0,999 | 235,434 | | |
| 40 | 3 | 7,787 | | | | |
| 60 | 3 | 13,525 | | | | |
| 80 | 3 | 17,623 | | | | |
| 100 | 3 | 21,311 | | | | |
| 250 | 3 | 53,529 | | | | |

**Formula 3**

| Replikasi | Konsentrasi (ppm) | Abs DPPH | Abs sampel |
|---|---|---|---|
| 1 | 20 | 0,716 | 0,703 |
| | 40 | | 0,679 |
| | 60 | | 0,647 |
| | 80 | | 0,612 |
| | 100 | | 0,566 |
| | 250 | | 0,333 |
| 2 | 20 | | 0,701 |
| | 40 | | 0,676 |
| | 60 | | 0,648 |
| | 80 | | 0,611 |
| | 100 | | 0,568 |
| | 250 | | 0,329 |
| 3 | 20 | | 0,703 |
| | 40 | | 0,677 |
| | 60 | | 0,647 |
| | 80 | | 0,613 |
| | 100 | | 0,567 |
| | 250 | | 0,332 |

**Perhitungan $IC_{50}$ ekstak biji kelor**

Y = a+bx

X = nilai $IC_{50}$

**Replikasi 1**

$$50 = -3{,}306 + 0{,}228x$$

$$x = \frac{50-(-3{,}306)}{0{,}228}$$

$$x = 233{,}757$$

**Replikasi 2**

$$50 = -3{,}270 + 0{,}229x$$

$$x = \frac{50-(-3{,}270)}{0{,}229}$$

$$x = 232{,}188$$

**Replikasi 3**

$$50 = -3{,}304 + 0{,}228x$$

$$x = \frac{50-(-3{,}304)}{0{,}228}$$

$$x = 233{,}506$$

| Konsentrasi (ppm) | Replikasi | % inhibisi | Regresi linier (a, b, r) | $IC_{50}$ | Rata-rata | SD |
|---|---|---|---|---|---|---|
| 20 | 1 | 1,816 | a = -3,306<br>b = 0,228<br>r = 0,999 | 233,757 | 233,151 | 0,843 |
| 40 | 1 | 5,168 | | | | |
| 60 | 1 | 9,637 | | | | |
| 80 | 1 | 14,525 | | | | |
| 100 | 1 | 20,950 | | | | |
| 250 | 1 | 53,492 | | | | |
| 20 | 2 | 2,095 | a = -3,270<br>b = 0,229<br>r = -0,999 | 232,188 | | |
| 40 | 2 | 5,587 | | | | |
| 60 | 2 | 9,497 | | | | |
| 80 | 2 | 14,665 | | | | |
| 100 | 2 | 20,670 | | | | |
| 250 | 2 | 54,050 | | | | |
| 20 | 3 | 1,816 | a = -3,304<br>b = 0,228<br>r = 0,999 | 233,506 | | |
| 40 | 3 | 5,447 | | | | |
| 60 | 3 | 9,637 | | | | |
| 80 | 3 | 14,385 | | | | |
| 100 | 3 | 20,810 | | | | |
| 250 | 3 | 53,631 | | | | |

## Lampiran 24. Hasil Uji ANOVA Aktivitas Antioksidan Nanosuspensi

### Hasil Uji Normalitas

**Tests of Normality**

| | | Kolmogorov-Smirnov[a] | | | Shapiro-Wilk | | |
|---|---|---|---|---|---|---|---|
| | Formula | Statistic | df | Sig. | Statistic | df | Sig. |
| IC50 | F1 | .212 | 3 | . | .990 | 3 | .811 |
| | F2 | .232 | 3 | . | .980 | 3 | .728 |
| | F3 | .330 | 3 | . | .866 | 3 | .285 |

a. Lilliefors Significance Correction

**Hasil Uji Homogenitas**

**Test of Homogeneity of Variances**

| | | Levene Statistic | df1 | df2 | Sig. |
|---|---|---|---|---|---|
| IC50 | Based on Mean | .057 | 2 | 6 | .946 |
| | Based on Median | .010 | 2 | 6 | .990 |
| | Based on Median and with adjusted df | .010 | 2 | 5.286 | .990 |
| | Based on trimmed mean | .050 | 2 | 6 | .952 |

**Hasil Uji Anova**

**ANOVA**

IC50

| | Sum of Squares | df | Mean Square | F | Sig. |
|---|---|---|---|---|---|
| Between Groups | 57.815 | 2 | 28.908 | 43.308 | .000 |
| Within Groups | 4.005 | 6 | .667 | | |
| Total | 61.820 | 8 | | | |

| | | | | |
|---|---|---|---|---|
| F1 | 3 | 230.03500 | | |
| F3 | 3 | | 233.15033 | |
| F2 | 3 | | | 236.24333 |
| Sig. | | 1.000 | 1.000 | 1.000 |

Means for groups in homogeneous subsets are displayed.

a. Uses Harmonic Mean Sample Size = 3.000.

**Lampiran 25. Data perhitungan % Inhibisi nanosuspensi dan hasil uji antioksidan.**

$$\% \text{ Inhibisi} = \frac{\text{absorbansi DPPH} - \text{absorbansi sampel}}{\text{absorbansi DPPH}} \text{ x } 100\%$$

| Sampel | Replikasi | Abs DPPH | Abs Sampel | % Inhibisi | Rata-rata | SD |
|---|---|---|---|---|---|---|
| **F1** | 1 | 0,649 | 0,649 | 0,0 | 0,1 | 0,05 |
| | 2 | | 0,648 | 0,2 | | |
| | 3 | | 0,648 | 0,2 | | |
| **F2** | 1 | | 0,649 | 0,0 | 0,1 | |
| | 2 | | 0,649 | 0,0 | | |
| | 3 | | 0,648 | 0,2 | | |
| **F3** | 1 | | 0,649 | 0,0 | 0,0 | |
| | 2 | | 0,649 | 0,0 | | |
| | 3 | | 0,649 | 0,0 | | |