


## LAMPIRAN

## Lampiran 1 Lembar Bimbingan Skripsi

## 1. Lembaran Bimbingan Skripsi



**UNIVERSITAS PGRI ADI BUANA SURABAYA**  
**FAKULTAS SAINS DAN KESEHATAN**  
**PROGRAM STUDI S-1 FARMASI**

Kampus I : Jl. Ngagel Dadi III-B 37 Telp. (031) 5041097 Fax. (031) 5042804 Surabaya 60245  
 II : Jl. Dukuh Menanggal XII, Telp/ Fax. (031) 8289637. Surabaya, 60234

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**LEMBAR BIMBINGAN ~~PROPOSAL SKRIPSI/SKRIPSI~~\***

Nama : Margareta Nilam Sari .....

NIM : 199010030 .....

Judul : Analisis Hidrokuinon Dalam Kosmetik Tanpa Izin Edar .....

Pada Marketplace .....

.....

.....

Nama DPU : Apt. Dewi Perwito Sari, M. Farm .....

Nama DPA : Apt. Prisma Triada H., M. Farm .....

No.	Hari/Tgl	Kegiatan yang diselesaikan/ dikonsultasikan	Hasil	Keterangan, parafr/ttd DPU/DPA
1	14/02/23	-Bem konsultasi perhitungan - konsu	- saran perubahan konsentrasi	Penj.
2	23/06/23	konsultasi Perzi Hasil	- Acc	Penj.
3	senin/03/07/23	Bimbingan Bab 4-5	-Memperbaiki kalimat	Penj.
4	Rabu/04/07/23	konsultasi BAB 1-5	ACC	Penj.

\*Pilih salah Satu

## 2. Lembar Bimbingan Skripsi 2



UNIVERSITAS PGRI ADI BUANA SURABAYA  
 FAKULTAS SAINS DAN KESEHATAN  
 PROGRAM STUDI S-1 FARMASI

Kampus I : Jl. Ngagel Dadi III-B 37 Telp. (031) 5041097 Fax. (031) 5042804 Surabaya 60245  
 II : Jl. Dukuh Menanggal XII, Telp/ Fax. (031) 8289637. Surabaya, 60234

## LEMBAR BIMBINGAN PROPOSAL SKRIPSI/SKRIPSI\*

Nama : Margareta Nilam Sari  
 NIM : 194010030  
 Judul : Analisis Hidrokinon Dalam Kosmetik Tanpa Izin Edar pada Marketplace Dengan menggunakan Metode Spektrofotometri UV-vis  
 Nama DPU : Apb. Dewi Perulita Sari, M. Farm  
 Nama DPA : Apt. Pisma Trida H., M. Farm

No.	Hari/Tgl	Kegiatan yang diselesaikan/ dikonsultasikan	Hasil	Keterangan, paraf/ttd DPU/DPA
1.	15/02/2013	konsultasi Perhitungan	ACC	
2.	23/06/23	konsultasi Hasil	ACC	
3.	Palu/28/06/23	konsultasi BAB 4-5	ACC	
4.	Palu/06/07/23	konsultasi BAB 1-5	ACC	

\*Pilih salah Satu

**Lampiran 2**  
**Form Revisian Skripsi**

**FORM REVISI PROPOSAL SKRIPSI/SKRIPSI\***

Nama : Margareta Nilam Sari  
 NIM : 19410030  
 Judul : ANALISIS Hidrokuinon dalam Kosmetik tanpa  
Izin Edar Pada marketplace dengan menggunakan  
Metode Spektrofotometri UV-Vis.

Telah menghadap pada :	Tanggal	TTD
Dosen Pembimbing Utama		
<u>apt. Dewi Perwito Sari, M.Farm</u> NIDN 0726099006	<u>27/7/23</u>	<u>Dy.</u>
Dosen Pembimbing Anggota		
<u>apt. Prisma Trida Hardani, M.Farm</u> NIDN 0706069105	<u>27/7<sup>23</sup></u>	<u>P2h1</u>
Dosen Penguji		
<u>apt. Asri Wido Mukti, M.Farm.Klin</u> NIDN 0725098904	<u>29/7<sup>23</sup></u>	<u>Asri</u>

\*Pilih salah satu

### Lampiran 3

#### Perhitungan Pembuatan Larutan Uji Kuantitatif

##### 1. Larutan induk 5mg hidrokuinon dalam 100 ml etanol absolute p.a

$$\text{Ppm} = 5 \text{ mg} / 0.1 \text{ l} = 50 \text{ ppm}$$

##### 2. Larutan baku 10 ppm

$$V_1 \cdot M_1 = V_2 \cdot M_2$$

$$V_1 \cdot 50 = 50 \cdot 10$$

$$V_1 = 10 \text{ ml}$$

##### 3. Uji Linearitas

- **0.08 ppm**

$$V_1 \cdot 10 \text{ ppm} = 25 \text{ ml} \cdot 0,08 \text{ ppm}$$

$$V_1 = 0.2 \text{ ml (200 } \mu\text{L)}$$

- **0.16 ppm**

$$V_1 \cdot 10 \text{ ppm} = 25 \text{ ml} \cdot 0,16 \text{ ppm}$$

$$V_1 = 0.4 \text{ (400 } \mu\text{L)}$$

- **0.24 ppm**

$$V_1 \cdot 10 \text{ ppm} = 25 \text{ ml} \cdot 0,24 \text{ ppm}$$

$$V_1 = 0.6 \text{ ml (600 } \mu\text{L)}$$

- **0.32 ppm**

$$V_1 \cdot 10 \text{ ppm} = 25 \text{ ml} \cdot 0,32 \text{ ppm}$$

$$V_1 = 0.8 \text{ ml (800 } \mu\text{L)}$$

- **0.40 ppm**

$$V_1 \cdot 10 \text{ ppm} = 25 \text{ ml} \cdot 0,40$$

$$V_1 = 1 \text{ ml (1000 } \mu\text{L)}$$

##### 4. Uji LOD dan LOQ

- **0.04 ppm**

$$V_1 \cdot 10 \text{ ppm} = 25 \text{ ml} \cdot 0,04 \text{ ppm}$$

$$V_1 = 0.01 \text{ ml (100 } \mu\text{L)}$$

- **0.05 ppm**

$$V_1 \cdot 10 \text{ ppm} = 25 \text{ ml} \cdot 0,05 \text{ ppm}$$

$$V_1 = 0,125 \text{ ml (125 } \mu\text{L)}$$

- **0.06 ppm**

$$V1 \cdot 10 \text{ ppm} = 25 \text{ ml} \cdot 0.06 \text{ ppm}$$

$$V1 = 0,15 \text{ ml ( 150 } \mu\text{L)}$$

- **0.07 ppm**

$$V1 \cdot 10 \text{ ppm} = 25 \text{ ml} \cdot 0.07 \text{ ppm}$$

$$V1 = 0,175 \text{ ml ( 175 } \mu\text{L)}$$

- **0.08 ppm**

$$V1 \cdot 10 \text{ ppm} = 25 \text{ ml} \cdot 0,08 \text{ ppm}$$

$$V1 = 0,2 \text{ ml ( 200 } \mu\text{L)}$$

## Lampiran 4

### Perhitungan Hasil Validasi Metode

#### 1. Hasil LOD dan LOQ

Ppm	Absorbansi	$(x_1 - \bar{x})$	$(x_1 - \bar{x})^2$
0,04	0,0492	0,0162	0,00026244
0,05	0,0573	0,0081	0,00006561
0,06	0,0652	0,0002	0,00000004
0,07	0,0740	0,0086	0,00007396
0,08	0,0814	0,16	0,000256
$\Sigma$	$\bar{x} = 0,0654$		0,00065865

$$\begin{aligned}
 \bullet \text{ SD} &= \sqrt{\frac{(x_1 - \bar{x}) + \dots + (X_n - \bar{x})}{n-1}} \\
 &= \sqrt{\frac{0,0065865}{4}} \\
 &= \sqrt{0,0001645125} \\
 &= 0,01283
 \end{aligned}$$

$$\begin{aligned}
 \bullet \text{ LOD} &= \frac{3 \times \text{SD}}{\text{SLOPE}} \\
 &= \frac{3 \times 0,01283}{0,8110} \\
 &= 0,0474 \text{ ppm}
 \end{aligned}$$

$$\begin{aligned}
 \bullet \text{ LOQ} &= \frac{10 \times \text{SD}}{\text{SLOPE}} \\
 &= \frac{10 \times 0,01283}{0,8110} \\
 &= 0,1582 \text{ ppm}
 \end{aligned}$$

#### 2. Perhitungan Presisi

Absorbansi	Ppm	$(x_1 - \bar{x})$	$(x_1 - \bar{x})^2$
0,5882	0,9099	0,011	0,000121
0,5867	0,9174	0,0035	0,00001225
0,5892	0,9215	0,0006	0,00000036
0,5874	0,9185	0,0024	0,00000576
0,5907	0,9240	0,0031	0,00000961
0,5970	0,9344	0,0135	0,00018225
$\Sigma$	$\bar{x} = 0,9209$		0,00033123

$$\bullet \text{ SD} = \sqrt{\frac{(x_1 - \bar{x}) + \dots + (X_n - \bar{x})}{n-1}}$$

$$= \sqrt{\frac{0,00033123}{5}}$$

$$= \sqrt{0,000066246}$$

$$= 0,0081391646$$

- $RSD = \frac{0,0081}{0,9209} \times 100\%$
- $= 0,879\%$

### 3. Perhitungan Akurasi

#### • Perhitungan sampel adisi 45%, 60% dan 80%

1.  $45\% = \frac{45}{100} \times 0.9 \text{ ppm}$   
 $= 0,405 \text{ ppm}$   
 $m1.v1 = m2.v2$   
 $1 \text{ ppm}.V1 = 0.405 \text{ ppm}.10 \text{ ml}, v1 = 4,05 \text{ ml}$
2.  $60\% = \frac{60}{100} \times 0.9 \text{ ppm}$   
 $= 0,54 \text{ ppm}$   
 $m1.v1 = m2.v2$   
 $1 \text{ ppm}.V1 = 0.54 \text{ ppm}.10 \text{ ml}, v1 = 5,4 \text{ ml}$
3.  $80\% = \frac{80}{100} \times 0.9 \text{ ppm}$   
 $= 0,72 \text{ ppm}$   
 $m1.v1 = m2.v2$   
 $1 \text{ ppm}.V1 = 0.72 \text{ ppm}.10 \text{ ml}, v1 = 7,2 \text{ ml}$

#### • Perhitungan % Recovery

##### 1. Adisi 45%

$$\text{Konsentrasi teoritis} = 0.9 \text{ ppm} + 0.405 \text{ ppm}$$

$$= 1,305 \text{ ppm}$$

$$\% \text{ recovery} = \frac{\text{Konsentrasi sebenarnya}}{\text{Konsentrasi Teoritis}} \times 100 \%$$

##### a. Replikasi 1 ( 1.217)

$$\% R = \frac{1.217 \text{ ppm}}{1.305 \text{ ppm}} \times 100 \%$$

$$= 93,26\%$$

**b. Replikasi 2 ( 1.194 ppm)**

$$\begin{aligned} \% R &= \frac{1.194 \text{ ppm}}{1.305 \text{ ppm}} \times 100 \% \\ &= 91,49\% \end{aligned}$$

**c. Replikasi 3 ( 1.229 ppm)**

$$\begin{aligned} \% R &= \frac{1.229 \text{ ppm}}{1.305 \text{ ppm}} \times 100 \% \\ &= 94.17 \% \end{aligned}$$

Replikasi	absorbansi	ppm	% recovery
1	0.7676	1.217	93,26 %
2	0.7536	1.194	91,49 %
3	0.7749	1.229	94,17 %
Rata-rata			92,973 %
SD			± 1.3573%

$$\bar{x} = \frac{93,26\% + 91,49\% + 94,17\%}{3} = 92,973\%$$

$$SD = \sqrt{\frac{(x-\bar{x})^2, \dots, (xn-\bar{x})^2}{n-1}}$$

$$SD = \sqrt{\frac{(93,26-92,97)^2 + (91,49-92,97)^2 + (94,17-92,97)^2}{3-1}}$$

$$SD = \sqrt{\frac{0,0841+2,1904+1,44}{2}}$$

$$SD = \sqrt{1.84225} = 1,3573 \%$$

**2. Adisi 60%**

$$\begin{aligned} \text{Konsentrasi teoritis} &= 0.9 \text{ ppm} + 0.54 \text{ ppm} \\ &= 1,44 \text{ ppm} \end{aligned}$$

$$\% \text{ recovery} = \frac{\text{Konsentrasi sebenarnya}}{\text{Konsentrasi Teoritis}} \times 100 \%$$

**a. Replikasi 1 ( 1.305)**

$$\begin{aligned} \% R &= \frac{1.305 \text{ ppm}}{1.44 \text{ ppm}} \times 100 \% \\ &= 90.62 \% \end{aligned}$$

**b. Replikasi 2( 1.334)**

$$\begin{aligned} \% R &= \frac{1.334 \text{ ppm}}{1.44 \text{ ppm}} \times 100 \% \\ &= 92.64 \% \end{aligned}$$



**c. Replikasi 3( 1.351)**

$$\begin{aligned} \% R &= \frac{1.351 \text{ ppm}}{1.44 \text{ ppm}} \times 100 \% \\ &= 93.82 \% \end{aligned}$$

Replikasi	Absorbansi	ppm	% recovery
1	0.8207	1.305	90.62%
2	0.8382	1.334	92.64%
3	0.8154	1.351	93.82 %
Rata-rata			92.36 %

$$\bar{x} = \frac{90.62\% + 92.64\% + 93.82\%}{3} = 92,36\%$$

$$SD = \sqrt{\frac{(X-\bar{X})^2, \dots, (xn-\bar{x})^2}{n-1}}$$

$$SD = \sqrt{\frac{(90,62-92,36)^2 + (92,64-92,36)^2 + (93,82-92,36)^2}{3-1}}$$

$$SD = \sqrt{\frac{3,0276 + 0,0784 + 2,1316}{2}}$$

$$SD = \sqrt{2.6188} = 1,6833\%$$

**3. Adisi 80%**

$$\begin{aligned} \text{Konsentrasi teoritis} &= 0.9 \text{ ppm} + 0.72 \text{ ppm} \\ &= 1,62\text{ppm} \end{aligned}$$

$$\% \text{ recovery} = \frac{\text{Konsentrasi sebenarnya}}{\text{Konsentrasi Teoritis}} \times 100 \%$$

**a. Replikasi 1 ( 1.7284 ppm)**

$$\begin{aligned} \% R &= \frac{1.7284 \text{ ppm}}{1.44 \text{ ppm}} \times 100 \% \\ &= 106,69 \% \end{aligned}$$

**b. Replikasi 2( 1.7317ppm)**

$$\begin{aligned} \% R &= \frac{1.7317 \text{ ppm}}{1.44 \text{ ppm}} \times 100 \% \\ &= 106,89 \% \end{aligned}$$

**c. Replikasi 3( 1.7509ppm)**

$$\begin{aligned} \% R &= \frac{1.7509\text{ppm}}{1.44 \text{ ppm}} \times 100 \% \\ &= 108.08\% \end{aligned}$$

Replikasi	Absorbansi	ppm	% recovery
1	1.0761	1.7284	106,69%
2	1.0781	1.7317	106,89%
3	1.0897	1.7509	108,08%
Rata-rata			107,22%

$$\bar{x} = \frac{106,69\% + 106,89\% + 108,08\%}{3} = 107,22\%$$

$$SD = \sqrt{\frac{(x-\bar{x})^2, \dots, (xn-\bar{x})^2}{n-1}}$$

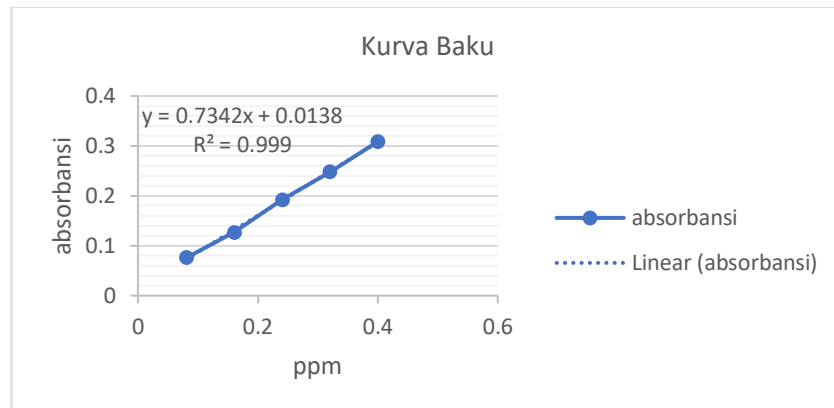
$$SD = \sqrt{\frac{(106,69-107,22)^2 + (106,89-107,22)^2 + (108,08-107,22)^2}{3-1}}$$

$$SD = \sqrt{\frac{0,2809 + 0,1089 + 0,7389}{2}}$$

$$SD = \sqrt{0,56435} = 0,7391 \%$$

## Lampiran 5

### Perhitungan Hasil Pengukuran Sampel



Kurva Baku standar

#### 1. Sampel A

Replikasi	Absorbansi	Ppm
1	0,5992	0,7973
2	0,5853	0,7784
3	0,5661	0,7522
Rata-rata		0,7759

Perhitungan sampel (  $Y = ax + b$  ) (  $y = 0.7342x + 0.0138$  )

##### a. Replikasi 1 :

$$0,5992 = 0,7342x + 0,0138$$

$$0,5992 - 0,0138 = 0,7324x$$

$$0,5854 = 0,7342x$$

$$\frac{0,5854}{0,7324} = x, x = 0,7973 \text{ ppm}, 0.0000007973 \% \text{ b/v}$$

##### b. Replikasi 2 :

$$0,5853 = 0,7342x + 0,0138$$

$$0,5853 - 0,0138 = 0,7324x$$

$$0,5715 = 0,7342x$$

$$\frac{0,5715}{0,7324} = x, x = 0,77839 \text{ ppm}, 0.00000077839 \% \text{ b/v}$$

**c. Replikasi 3 :**

$$0,5661 = 0,7342x + 0,0138$$

$$0,5661 - 0,0138 = 0,7324x$$

$$0,5523 = 0,7342x$$

$$\frac{0,5523}{0,7324} = x, x = 0,7522 \text{ ppm}, 0,0000007522$$

$$SD = \sqrt{\frac{(X-\bar{X})^2, \dots, (xn-\bar{x})^2}{n-1}}$$

$$SD = \sqrt{\frac{(0,7973-0,7759)^2 + (0,7784-0,7759)^2 + (0,7522-0,7759)^2}{3-1}}$$

$$SD = \sqrt{\frac{0,00045796 + 0,00000625 + 0,00056169}{2}}$$

$$SD = \sqrt{0,0051295} = 0,07162 \text{ ppm}$$

**2. Sampel B**

Replikasi	absorbansi	Ppm
1	0,7470	0,9986
2	0,7253	0,9690
3	0,7304	0,9760
Rata-rata		0,9812

Perhitungan sampel (  $Y = ax + b$  ) (  $y = 0,7342x + 0,0138$  )

**a. Replikasi 1 :**

$$0,7470 = 0,7342x + 0,0138$$

$$0,7470 - 0,0138 = 0,7324x$$

$$0,7332 = 0,7342x$$

$$\frac{0,7332}{0,7324} = x, x = 0,9986 \text{ ppm}, 0,0000009986\% \text{ b/v}$$

**b. Replikasi 2 :**

$$0,7253 = 0,7342x + 0,0138$$

$$0,7253 - 0,0138 = 0,7324x$$

$$0,7115 = 0,7342x$$

$$\frac{0,7115}{0,7324} = x, x = 0,9690 \text{ ppm}, 0,0000007342\% \text{ b/v}$$

**c. Replikasi 3**

$$0,7304 = 0,7342x + 0,0138$$

$$0,7304 - 0,0138 = 0,7324x$$

$$0,7166 = 0,7342x, 0.0000007343$$

$$\frac{0,7166}{0,7324} = x, x = 0,9760 \text{ ppm}, 0.0000009760 \% \text{ b/v}$$

$$SD = \sqrt{\frac{(X-\bar{X})^2, \dots, (xn-\bar{x})^2}{n-1}}$$

$$SD = \sqrt{\frac{(0,9986-0,9812)^2 + (0,9690-0,9812)^2 + (0,9760-0,9812)^2}{3-1}}$$

$$SD = \sqrt{\frac{0,00030276 + 0,00014884 + 0,00002704}{2}}$$

$$SD = \sqrt{0,00023932} = 0,04892 \text{ ppm}$$

### 3. Sampel C

Replikasi	absorbansi	ppm
1	0.7125	0.9516
2	0.6906	0.9218
3	0.6945	0.9271
Rata-rata		0.9335

**Perhitungan sampel (  $Y = ax + b$  ) (  $y = 0.7342x + 0.0138$**

#### a. Replikasi 1 :

$$0,7125 = 0,7342x + 0,0138$$

$$0,7470 - 0,0138 = 0,7324x$$

$$0,6987 = 0,7342x$$

$$\frac{0,6987}{0,7324} = x, x = 0,9516 \text{ ppm}, 0.0000009516 \% \text{ b/v}$$

#### b. Replikasi 2 :

$$0,6906 = 0,7342x + 0,0138$$

$$0,6906 - 0,0138 = 0,7324x$$

$$0,6768 = 0,7342x$$

$$\frac{0,6768}{0,7324} = x, x = 0,9218 \text{ ppm}, 0.0000009218\%$$

#### c. Replikasi 3 :

$$0,6945 = 0,7342x + 0,0138$$

$$0,6945 - 0,0138 = 0,7324x$$

$$0,6807 = 0,7342x$$

$$\frac{0,6807}{0,7324} = x, x = 0,9271 \text{ ppm}, 0.0000009271 \% \text{ b/v}$$

$$SD = \sqrt{\frac{(X-\bar{X})^2 + \dots + (xn-\bar{x})^2}{n-1}}$$

$$SD = \sqrt{\frac{(0,9514-0,9335)^2 + (0,9218-0,9335)^2 + (0,9271-0,9335)^2}{3-1}}$$

$$SD = \sqrt{\frac{0,0032761 + 0,00013689 + 0,000000409}{2}}$$

$$SD = \sqrt{0,00023} = 0,01516 \text{ ppm}$$

#### 4. Sampel D

Replikasi	absorbansi	ppm
1	0.6597	0.8797
2	0.6870	0.9169
3	0.7236	0.9667
Rata-rata		0.9211

**Perhitungan sampel (  $Y = ax + b$  ) (  $y = 0.7342x + 0.0138$**

##### a. Replikasi 1 :

$$0,6597 = 0,7342x + 0,0138$$

$$0,6597 - 0,0138 = 0,7324x$$

$$0,6459 = 0,7342x$$

$$\frac{0,6459}{0,7324} = x, x = 0,8797 \text{ ppm}, 0.0000008797\% \text{ b/v}$$

##### b. Replikasi 2 :

$$0,6870 = 0,7342x + 0,0138$$

$$0,6870 - 0,0138 = 0,7324x$$

$$0,6732 = 0,7342x$$

$$\frac{0,6732}{0,7324} = x, x = 0,9169 \text{ ppm}, 0.0000009169\% \text{ b/v}$$

##### c. Replikasi 3 :

$$0,7236 = 0,7342x + 0,0138$$

$$0,7236 - 0,0138 = 0,7324x$$

$$0,7098 = 0,7342x$$

$$\frac{0,7098}{0,7324} = x, x = 0,9667 \text{ ppm}, 0.0000009667\% \text{ b/v}$$

$$SD = \sqrt{\frac{(X-\bar{X})^2, \dots, (xn-\bar{x})^2}{n-1}}$$

$$SD = \sqrt{\frac{(0,8797-0,9211)^2 + (0,9169-0,9211)^2 + (0,9667-0,9211)^2}{3-1}}$$

$$SD = \sqrt{\frac{0,0017396 + 0,00002764 + 0,00207936}{2}}$$

$$SD = \sqrt{0,0019} = 0,0436 \text{ ppm}$$

## 5. Sampel E

Replikasi	Absorbansi	ppm
1	0.4918	0.6510
2	0.4633	0.6122
3	0.4578	0.6047
Rata-rata		0.6226

Perhitungan sampel (  $Y = ax + b$  ) (  $y = 0.7342x + 0.0138$  )

### a. Replikasi 1 :

$$0,4918 = 0,7342x + 0,0138$$

$$0,4918 - 0,0138 = 0,7324x$$

$$0,478 = 0,7342x$$

$$\frac{0,478}{0,7324} = x, x = 0, 6510 \text{ ppm}, 0.0000006510 \% \text{ b/v}$$

### b. Replikasi 2:

$$0,4633 = 0,7342x + 0,0138$$

$$0,4633 - 0,0138 = 0,7324x$$

$$0,4495 = 0,7342x$$

$$\frac{0,4495}{0,7324} = x, x = 0, 6122 \text{ ppm}, 0.0000006122\% \text{ b/v}$$

### c. Replikasi 3:

$$0,4578 = 0,7342x + 0,0138$$

$$0,4578 - 0,0138 = 0,7324x$$

$$0,444 = 0,7342x$$

$$\frac{0,444}{0,7324} = x, x = 0, 6047 \text{ ppm}, 0.0000006047\% \text{ b/v}$$

$$SD = \sqrt{\frac{(X-\bar{X})^2, \dots, (xn-\bar{x})^2}{n-1}}$$

$$SD = \sqrt{\frac{(0,6510-0,6226)^2 + (0,6122-0,6226)^2 + (0,6047-0,6226)^2}{3-1}}$$

$$SD = \sqrt{\frac{0,00080656 + 0,0001010816 + 0,00032041}{2}}$$

$$SD = \sqrt{0,00061} = 0,0781 \text{ ppm}$$



## Lampiran 6

## Sertifikat Bahan

1. *Certificaty Of Analysis Hidrokuinon*

**EASTMAN**  
300 Kodak Blvd.  
Longview, TX 75602  
USA

Certificate of Analysis

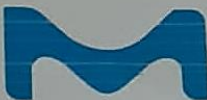
Date : 28 March 2020  
Product : EASTMAN™ HYDROQUINONE  
Manufacture : EASTMAN CHEMICAL Ltd  
Batch no. : TS200320  
Expiry date : N/A

Property	Unit	Minimum	Maximum	Results
Absorptivity @455 nm	ml/g*cm	-	0.190	0.041
Absorptivity @520 nm	ml/g*cm	-	0.120	0.020
Absorptivity @700 nm	ml/g*cm	-	0.070	0.003
Assay	%	99.40	101.00	99.60
Free-flowing White Crystals	-	-	-	PASSES
Iron (as Fe)	ug/g	-	10	< 1
pH	-	4.10	4.70	4.31
Water (karl Fisher)	%	-	0.60	0.48
Yellowness Index	-	-	35.0	18.3

2. Certificaty Of Analysis  $FeCl_3$ 

西陇科学股份有限公司 分析报告 Xilong Scientific Co., Ltd. Inspection Report					
					XH/R-ZG. 35-20 编号(No.):
品名 Commodity name	无水三氯化铁 Iron (III) chloride anhydrous		执行标准: Performance standard:	Q/STXH 388-2020 Q/STXH 388-2020	
分子式 Molecular formula	$FeCl_3$	相对分子质量 Relative molecular mass	162.20	级别 Grade	分析纯 Analytical reagent
出厂批号 Batch No.	210825 2	取样日期 Sampling date	2021.08.25	报告日期 Reporting date	2021.08.26
生产单位 Manufacturer	西陇科学股份有限公司 Xilong Scientific Co., Ltd.				
检验项目 Inspect items	标准规定 Specifications		检验结果 Inspect results		
含量(以 $FeCl_3$ 计), % Assay (as $FeCl_3$ ), %	$\geq 98.0$		98.2		
水不溶物, % Water insoluble matters, %	$\leq 0.05$		<0.05		
游离酸(以 HCl 计), % Free acid (as HCl), %	$\leq 0.2$		0.2		
硫酸盐 ( $SO_4$ ), % Sulfate ( $SO_4$ ), %	$\leq 0.015$		<0.015		
硝酸盐 ( $NO_3$ ), % Nitrate ( $NO_3$ ), %	$\leq 0.02$		<0.02		
磷酸盐 ( $PO_4$ ), % Phosphate ( $PO_4$ ), %	$\leq 0.02$		<0.02		
锰 (Mn), % Manganese (Mn), %	$\leq 0.04$		<0.04		
亚铁 ( $Fe^{2+}$ ), % Ferrite ( $Fe^{2+}$ ), %	$\leq 0.3$		<0.3		
铜 (Cu), % Cupric (Cu), %	$\leq 0.01$		0.01		
锌 (Zn), % Zinc (Zn), %	$\leq 0.005$		0.004		
砷 (As), % Arsenic (As), %	$\leq 0.003$		<0.003		
氨水不沉淀物(以硫酸盐计), % Non-sludging to ammonia water (as $SO_4$ ), %	$\leq 0.1$		0.06		
游离氯 (Cl) Free Chlorine (Cl)	合格 Pass test		合格 Pass test		
以下空白 End of Report					
结论: 经检验, 本批量产品质量符合 Q/STXH 388-2020 之分析纯规格。 Conclusion: By checking, the lot product quality accurate to Q/STXH 388-2020 with analytical reagent.					
负责人: 江爱虾 日期: 2021.08.26		复核员: 余辣娇 日期: 2021.08.26		化验员: 赵淑银 日期: 2021.08.26	

### 3. Certificaty Of Analysis Sodium Sulfat



## Certificate of Analysis

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1.06649.1000 Sodium sulfate anhydrous for analysis EMSURE® ACS,ISO,Reag. Ph Eur  
 Batch AM1826949

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	Spec. Values		Batch Values	
	Value	Unit	Value	Unit
Assay (alkalimetric)	≥ 99.0	%	100.2	%
Assay (alkalimetric, calculated on dried substance)	98.5 - 101.0	%	100.2	%
Identity	passes test		passes test	
Appearance of solution	passes test		passes test	
Insoluble matter	≤ 0.01	%	≤ 0.01	%
Acidity or alkalinity	passes test		passes test	
pH-value (5 %; water; 25 °C)	5.2 - 8.0		5.8	
Chloride (Cl)	≤ 0.001	%	≤ 0.001	%
Phosphate (PO <sub>4</sub> )	≤ 0.001	%	≤ 0.001	%
Total nitrogen (N)	≤ 0.0005	%	≤ 0.0005	%
Heavy metals (ACS)	≤ 0.0005	%	≤ 0.0005	%
Heavy metals (as Pb)	≤ 0.0005	%	≤ 0.0005	%
As (Arsenic)	≤ 0.0001	%	≤ 0.0001	%
Ca (Calcium)	≤ 0.005	%	≤ 0.005	%
Fe (Iron)	≤ 0.0005	%	≤ 0.0005	%
K (Potassium)	≤ 0.002	%	≤ 0.002	%
Mg (Magnesium)	≤ 0.001	%	≤ 0.001	%
Loss on drying (130 °C)	≤ 0.5	%	≤ 0.5	%
Loss on ignition (800 °C)	≤ 0.5	%	≤ 0.5	%

Corresponds to ACS, ISO, Reag. Ph Eur


Date of release (DD.MM.YYYY) 22.03.2022  
 Minimum shelf life (DD.MM.YYYY) 31.03.2027

Claudia Wiegand  
 Responsible laboratory manager quality control

This document has been produced electronically and is valid without a signature.

Merck KGaA, Frankfurter Straße 250, 64293 Darmstadt (Germany): +49 6151 72-0  
 EMD Millipore Corporation - a subsidiary of Merck KGaA, Darmstadt, Germany  
 400 Summit Drive, Burlington, MA 01803, USA, Phone +1 (781) 533-6000  
SALSA Version 1150982/990000924083/ Date: 22.03.2022

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4. *Certificaty Of Analysis Etanol Absolute*


## Certificate of Analysis

1.00983.2500 Ethanol absolute for analysis EMSURE® ACS,ISO,Reag. Ph Eur  
Batch I1171483

	Spec. Values		Batch Values	
Purity (GC)	≥ 99.9	%	99.9	%
Identity (IR)	conforms		conforms	
Appearance	conforms		conforms	
Color	≤ 10	Hazen	< 5	Hazen
Solubility in water	conforms		conforms	
Acidity or alkalinity	≤ 30	ppm	≤ 30	ppm
Titration acid	≤ 0.0002	meq/g	0.0001	meq/g
Titration base	≤ 0.0002	meq/g	< 0.0002	meq/g
Density (d 20 °C/20 °C)	0.790 - 0.793		0.791	
UV absorption	conforms		conforms	
Aldehydes (as Acetaldehyd)	≤ 0.001	%	≤ 0.001	%
Fusel oils	conforms		conforms	
Substances reducing potassium permanganate (as O)	≤ 0.0002	%	≤ 0.0002	%
Substances reducing permanganate (ACS)	conforms		conforms	
Carbonyl compounds (as CO)	≤ 0.003	%	≤ 0.003	%
Readily carbonizable substances	conforms		conforms	
Acetone, Isopropyl Alcohol (ACS)	conforms		conforms	
Acetone (GC)	≤ 0.001	%	< 0.001	%
Ethylmethylketone (GC)	≤ 0.02	%	< 0.01	%
Isoamyl alcohol (GC)	≤ 0.05	%	< 0.01	%
2-Propanol (GC)	≤ 0.01	%	< 0.01	%
Higher alcohols (GC)	≤ 0.01	%	< 0.01	%
Volatile impurities (GC) (Acetaldehyde and Acetal)	≤ 10	ppm	< 10	ppm
Volatile impurities (GC) (Benzene)	≤ 2	ppm	< 1	ppm
Volatile impurities (GC) (Methanol)	≤ 100	ppm	< 50	ppm
Volatile impurities (GC) (Total of other impurities)	≤ 300	ppm	< 100	ppm
Volatile impurities (GC) (disregard limit)	≤ 9	ppm	9	ppm
Chloride (Cl)	≤ 0.3	ppm	< 0.1	ppm
Nitrate (NO <sub>3</sub> )	≤ 0.3	ppm	< 0.1	ppm
Phosphate (PO <sub>4</sub> )	≤ 0.3	ppm	< 0.1	ppm
Sulfate (SO <sub>4</sub> )	≤ 0.3	ppm	< 0.1	ppm
Ag (Silver)	≤ 0.000002	%	≤ 0.000002	%
Al (Aluminium)	≤ 0.00005	%	≤ 0.00005	%
As (Arsenic)	≤ 0.000002	%	≤ 0.000002	%
Au (Gold)	≤ 0.000002	%	≤ 0.000002	%
Ba (Barium)	≤ 0.00001	%	≤ 0.00001	%
Be (Beryllium)	≤ 0.000002	%	≤ 0.000002	%
Bi (Bismuth)	≤ 0.000002	%	≤ 0.000002	%
Ca (Calcium)	≤ 0.00005	%	≤ 0.00005	%

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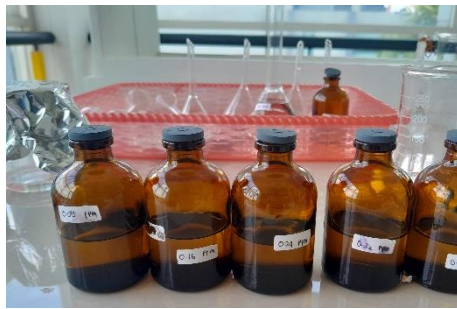
## Lampiran 7

### Gambar Larutan Bahan

**FeCl<sub>3</sub> 1%**



**Larutan Baku kerja**



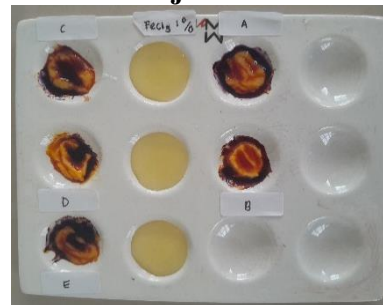
**Larutan 45% adisi**



**Larutan 45% adisi**



**Hasil Uji Kualitatif**



**Larutan baku kerja LOD dan LOQ**

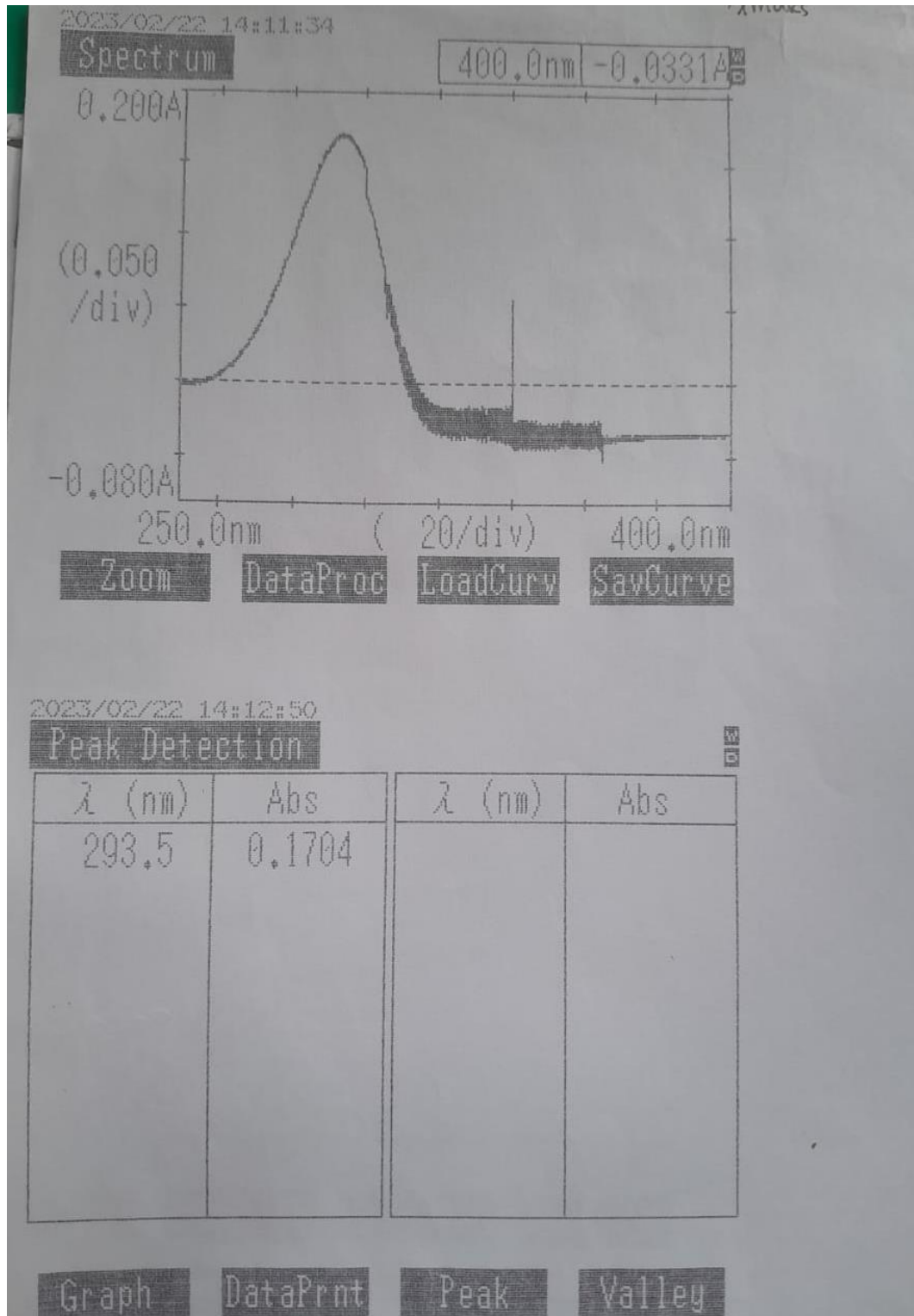


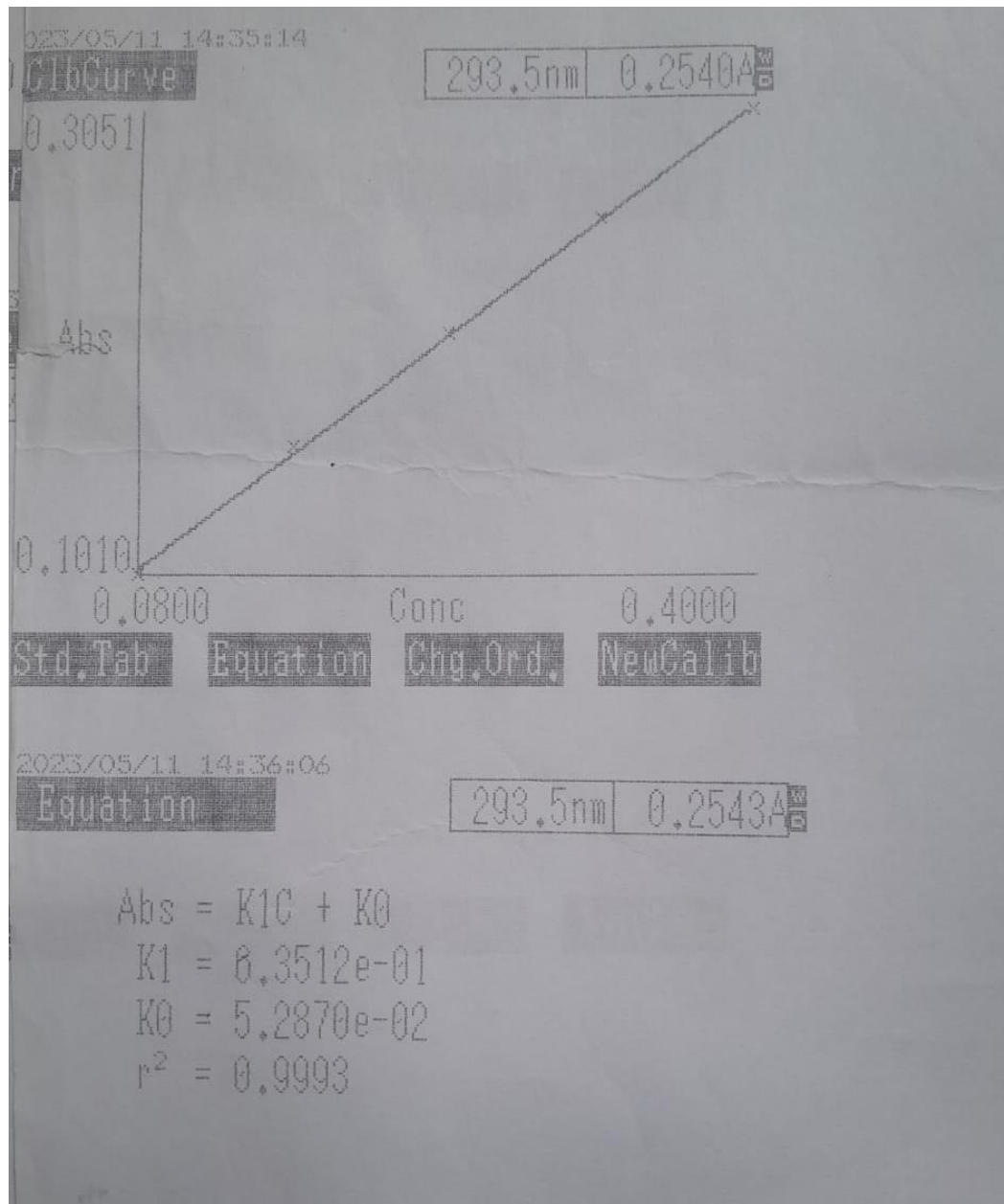
**Larutan Uji Presisi**



**Larutan 60% adisi****Larutan Uji Sampel**

**Lampiran 8**  
**Panjang Gelombang maksimum Hidrokuinon**

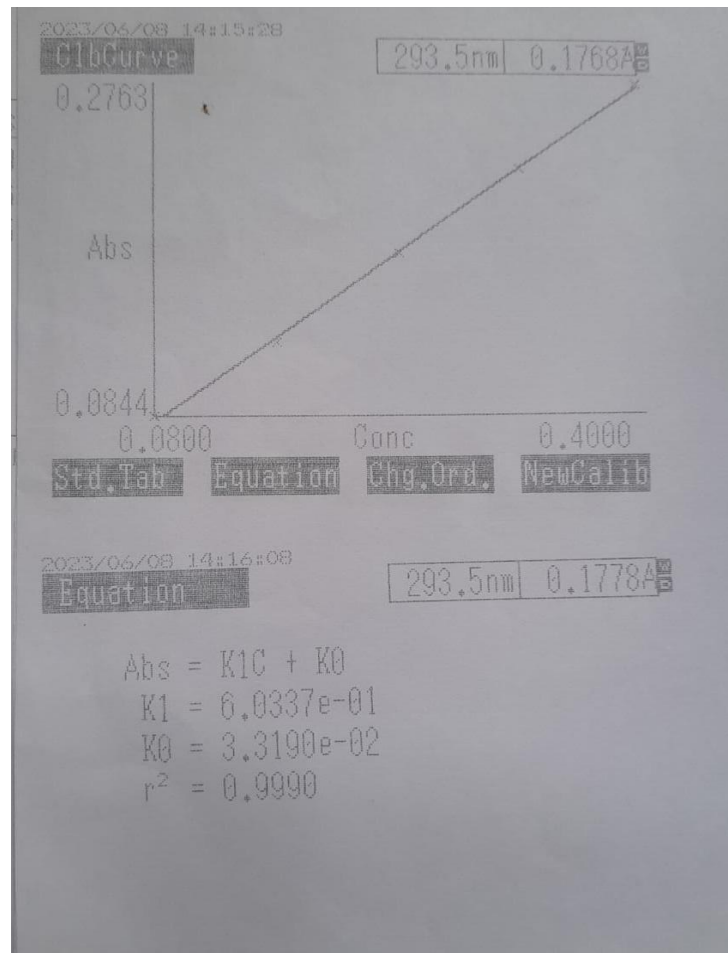


**Lampiran 9****Hasil Uji Linearitas**



## Lampiran 10

### Hasil Uji Presisi



3/06/08 14:36:24

Quantitation 293.5nm 0.5963A<sub>0</sub>

Smpl No.	Abs	Conc. (ppm)
1	0.5822	0.9099
2	0.5867	0.9174
3	0.5892	0.9215
4	0.5874	0.9185
5	0.5907	0.9240
6	0.5970	0.9344
7		

Press START to measure, (CE>Delete data)

Smpl No. C1bCurve DataDisp SaveData

## Lampiran 11

### Hasil Uji LOD dan LOQ

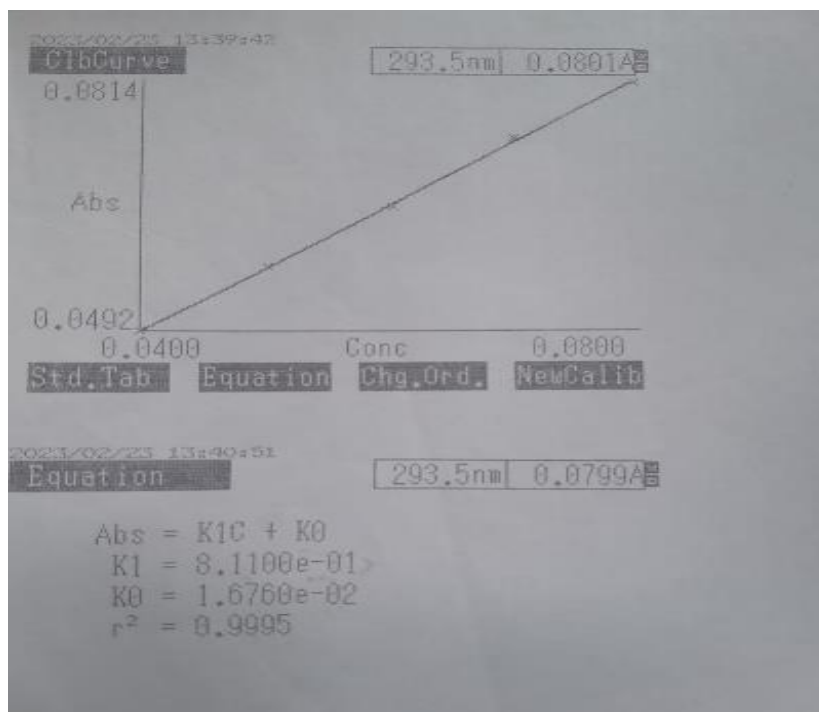
2023/02/23 13:38:56

Standard Table 293.5nm 0.0800A

No.	Conc.	Abs	No.	Abs
1	0.0400	0.0492	1	
2	0.0500	0.0573		
3	0.0600	0.0652		
4	0.0700	0.0740		
5	0.0800	0.0814		

Press START to Measure.

ClbCurve Change Delete Add



## Lampiran 12

### Hasil Uji Akurasi

#### a. 45% Adisi

2023/07/22 14:48:22

Photometric 293.5nm 0.7750A

Smpl No.	Abs	K*Abs
1	0.7676	0.0000
2	0.7536	0.0000
3	0.7749	0.0000
4		

Press START to measure. (CE:Delete data)

Smpl No. DataDisp SaveData

#### b. 60% Adisi

2023/07/22 16:03:17

Photometric 293.5nm 0.8488A

Smpl No.	Abs	K*Abs
1	0.8207	0.0000
2	0.8382	0.0000
3	0.8486	0.0000
4		

Press START to measure. (CE:Delete data)

Smpl No. DataDisp SaveData

#### c. 60% Adisi

2023/07/22 16:59:41

Photometric 293.5nm 1.0875A

Smpl No.	Abs	K*Abs
1	1.0761	0.0000
2	1.0781	0.0000
3	1.0897	0.0000
4		

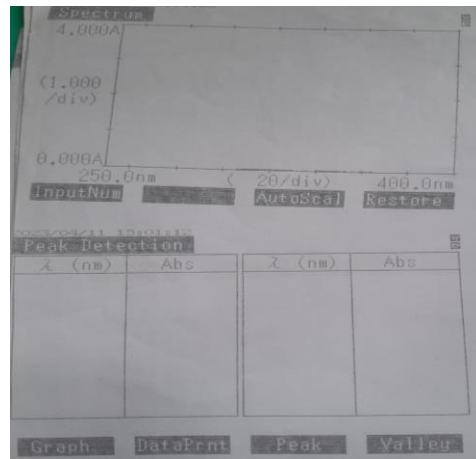
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Smpl No. DataDisp SaveData

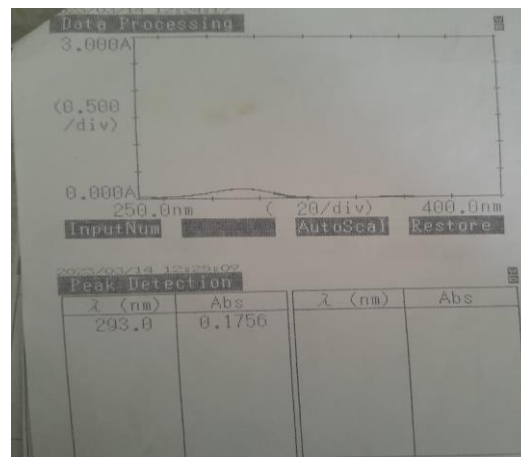
## Lampiran 13

### Hasil Uji iSelektivitas

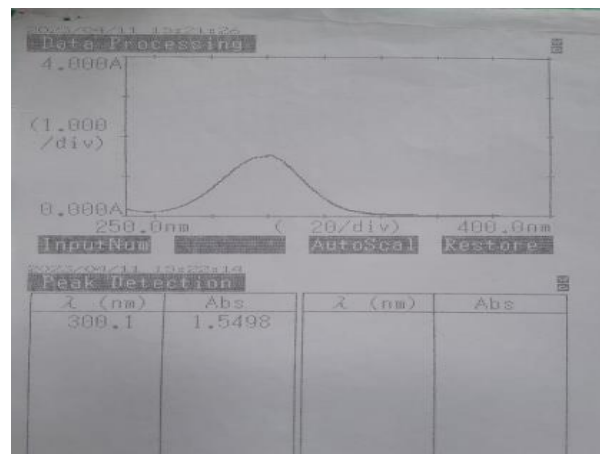
#### a. Blanko



#### b. Larutan Baku

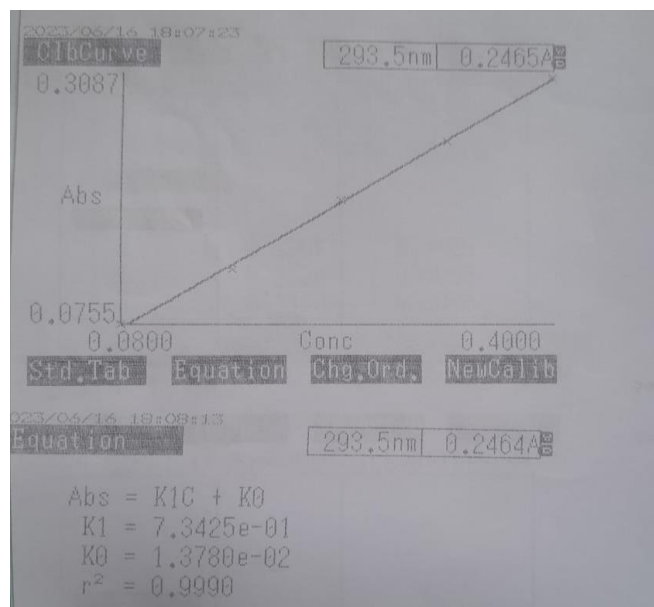


#### c. Panjang gelombang Sampel C



## Lampiran 14

### Hasil Pengukuran Sampel



#### a. Sampel A

2023/06/16 18:12:17

Quantitation 293.5nm 0.5663A

Smpl No.	Abs	Conc. (ppm)
1	0.5992	0.7973
2	0.5853	0.7784
3	0.5661	0.7522
4		

Press START to measure. (CE:Delete data)

Smpl No. C1bCurve DataDisp SaveData

## b. Sampel B

2023/05/16 18:13:20

Quantitation 293.5nm 0.7312A<sub>0</sub>

Smpl No.	Abs	Conc.(ppm)
1	0.7470	0.9986
2	0.7253	0.9690
3	0.7304	0.9760
4		

ress START to measure. (CE>Delete data)

Smpl No. ClbCurve DataDisp SaveData

## c. Sampel C

2023/05/16 18:13:20

Quantitation 293.5nm 0.7312A<sub>0</sub>

Smpl No.	Abs	Conc.(ppm)
1	0.7125	0.9516
2	0.6906	0.9218
3	0.6945	0.9271
4		

ress START to measure. (CE>Delete data)

Smpl No. ClbCurve DataDisp SaveData

## d. Sampel D

2023/05/16 18:22:32

Quantitation 293.5nm 0.7228A<sub>0</sub>

Smpl No.	Abs	Conc.(ppm)
1	0.6597	0.8797
2	0.6870	0.9169
3	0.7236	0.9667
4		

ress START to measure. (CE>Delete data)

Smpl No. ClbCurve DataDisp SaveData

## e. Sampel E

2023/04/16 18:26:30

Quantitation 293.5nm 0.4595Abs

Smpl No.	Abs	Conc. (ppm)
1	0.4918	0.6510
2	0.4633	0.6122
3	0.4578	0.6047
4		

Press START to measure. (CE>Delete data)

Smpl No. ClbCurve DataDisp SaveData