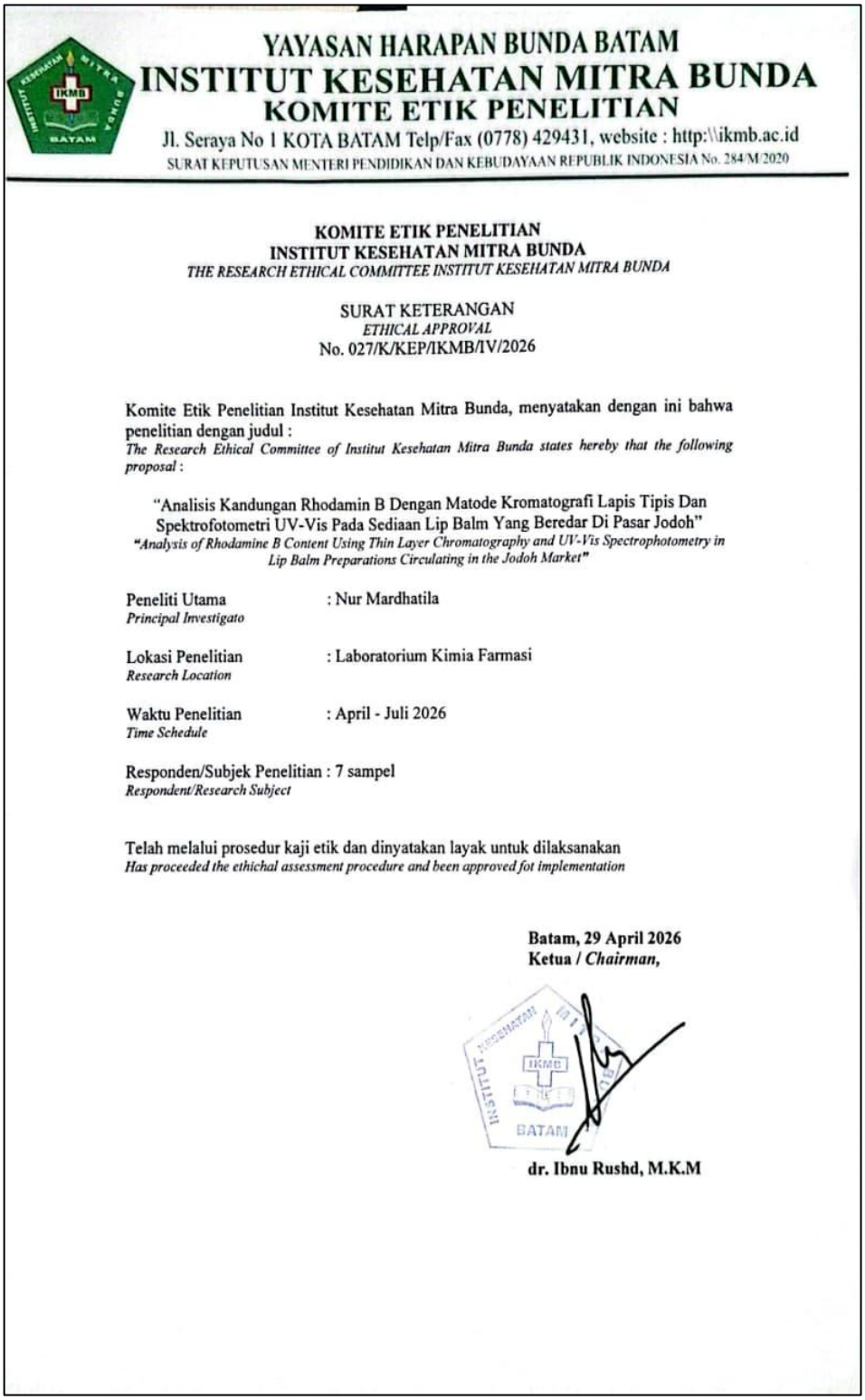
LAMPIRAN

Lampiran 1 Surat Keterangan Kode Etik Penelitian



YAYASAN HARAPAN BUNDA BATAM
INSTITUT KESEHATAN MITRA BUNDA
KOMITE ETIK PENELITIAN
Jl. Seraya No 1 KOTA BATAM Telp/Fax (0778) 429431, website : http:\\ikmb.ac.id
SURAT KEPUTUSAN MENTERI PENDIDIKAN DAN KEBUDAYAAN REPUBLIK INDONESIA No. 284/M/2020

KOMITE ETIK PENELITIAN
INSTITUT KESEHATAN MITRA BUNDA
THE RESEARCH ETHICAL COMMITTEE INSTITUT KESEHATAN MITRA BUNDA

SURAT KETERANGAN
ETHICAL APPROVAL
No. 027/K/KEP/IKMB/IV/2026

Komite Etik Penelitian Institut Kesehatan Mitra Bunda, menyatakan dengan ini bahwa penelitian dengan judul :
The Research Ethical Committee of Institut Kesehatan Mitra Bunda states hereby that the following proposal :

"Analisis Kandungan Rhodamin B Dengan Matode Kromatografi Lapis Tipis Dan Spektrofotometri UV-Vis Pada Sediaan Lip Balm Yang Beredar Di Pasar Jodoh"
"Analysis of Rhodamine B Content Using Thin Layer Chromatography and UV-Vis Spectrophotometry in Lip Balm Preparations Circulating in the Jodoh Market"

Peneliti Utama : Nur Mardhatila
Principal Investigato

Lokasi Penelitian : Laboratorium Kimia Farmasi
Research Location

Waktu Penelitian : April - Juli 2026
Time Schedule

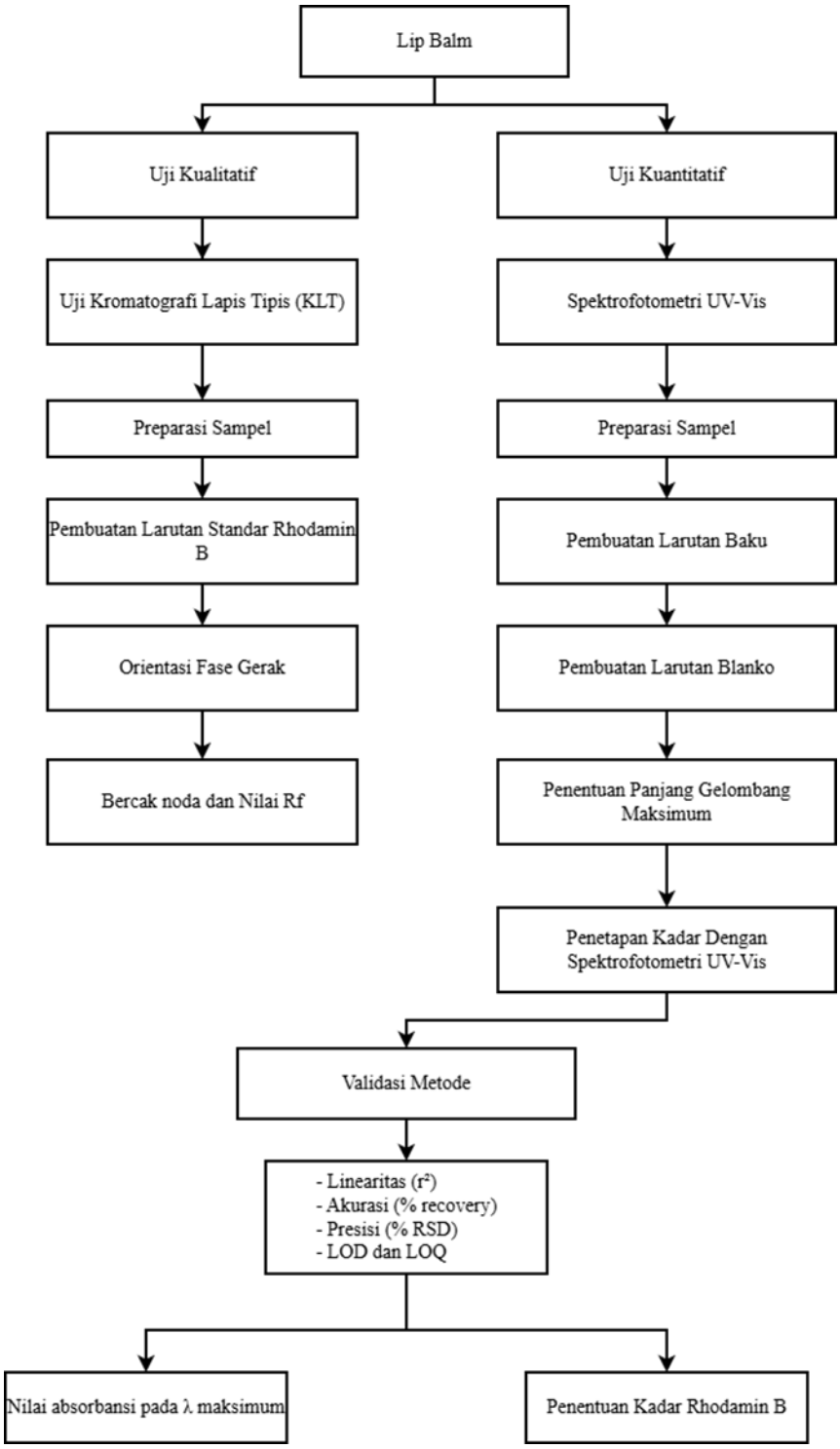
Responden/Subjek Penelitian : 7 sampel
Respondent/Research Subject

Telah melalui prosedur kaji etik dan dinyatakan layak untuk dilaksanakan
Has proceeded the ethichal assessment procedure and been approved fot implementation

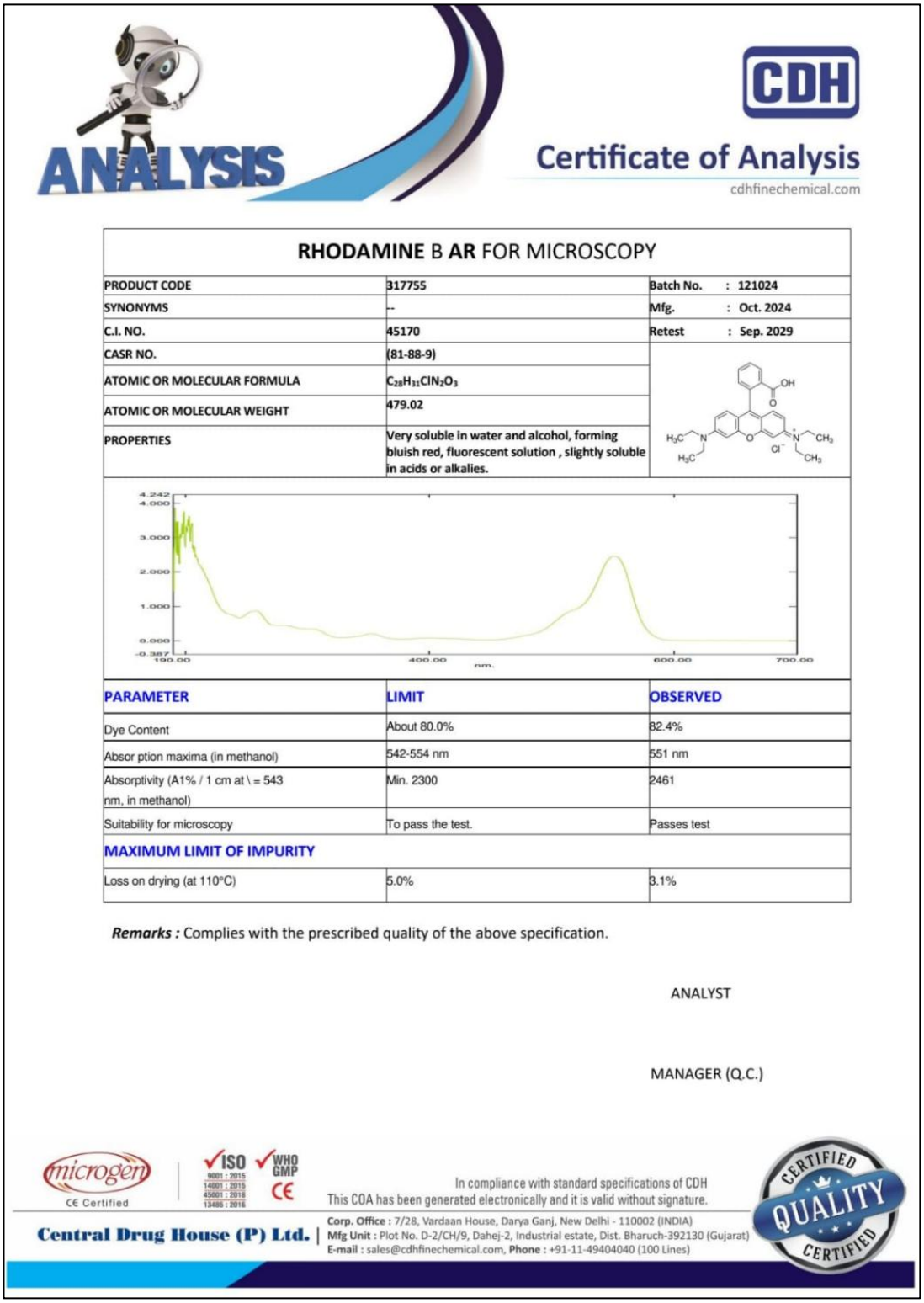
Batam, 29 April 2026
Ketua / *Chairman,*

dr. Ibnu Rushd, M.K.M

Lampiran 2 Skema Kerja



Lampiran 3 Sertifikat Analisis Rhodamin B



ANALYSIS

CDH

Certificate of Analysis

cdhfinechemical.com

RHODAMINE B AR FOR MICROSCOPY

PRODUCT CODE	317755	Batch No. : 121024
SYNONYMS	--	Mfg. : Oct. 2024
C.I. NO.	45170	Retest : Sep. 2029
CASR NO.	(81-88-9)	
ATOMIC OR MOLECULAR FORMULA	$C_{28}H_{31}ClN_2O_3$	
ATOMIC OR MOLECULAR WEIGHT	479.02	
PROPERTIES	Very soluble in water and alcohol, forming bluish red, fluorescent solution , slightly soluble in acids or alkalies.	

PARAMETER	LIMIT	OBSERVED
Dye Content	About 80.0%	82.4%
Absor ption maxima (in methanol)	542-554 nm	551 nm
Absorptivity (A1% / 1 cm at \ = 543 nm, in methanol)	Min. 2300	2461
Suitability for microscopy	To pass the test.	Passes test
MAXIMUM LIMIT OF IMPURITY		
Loss on drying (at 110°C)	5.0%	3.1%

Remarks : Complies with the prescribed quality of the above specification.

ANALYST

MANAGER (Q.C.)

microgen CE Certified | ISO 9001 : 2015 14001 : 2015 45001 : 2018 13485 : 2016 | WHO GMP | CE

In compliance with standard specifications of CDH
This COA has been generated electronically and it is valid without signature.

CERTIFIED QUALITY CERTIFIED

Central Drug House (P) Ltd. | **Corp. Office :** 7/28, Vardaan House, Darya Ganj, New Delhi - 110002 (INDIA)
Mfg Unit : Plot No. D-2/CH/9, Dahej-2, Industrial estate, Dist. Bharuch-392130 (Gujarat)
E-mail : sales@cdhfinechemical.com, **Phone :** +91-11-49404040 (100 Lines)

Lampiran 4 Sertifikat Analisis Etanol

Certificate of Analysis

1.00983.2500 Ethanol absolute for analysis EMSURE® ACS,ISO,Reag. Ph Eur
Batch I1296183

	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
Titrable acid	≤ 0.0002	meq/g	0.0001	meq/g
Titrable 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_3)	≤ 0.3	ppm	< 0.1	ppm
Phosphate (PO_4)	≤ 0.3	ppm	< 0.1	ppm
Sulfate (SO_4)	≤ 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	%

Merck KGaA
Corporation with General Partners
Frankfurter Straße 250
64293 Darmstadt, Germany

The life science business of Merck KGaA, Darmstadt, Germany operates as MilliporeSigma in the U.S. and Canada.

Lampiran 5 Sertifikat Analisis HCl Fuming 37%

Certificate of Analysis

1.00317.2500 Hydrochloric acid fuming 37% for analysis EMSURE® ACS,ISO, Reag. Ph Eur

Batch Z0933317

	Spec. Values		Batch Values	
Assay (alkalimetric)	37.0 - 38.0	%	37.4	%
Identity	passes test		passes test	
Color	≤ 10	Hazen	< 10	Hazen
Appearance	passes test		passes test	
Appearance of solution	passes test		passes test	
Bromide (Br)	≤ 50	ppm	36	ppm
Free chlorine (Cl)	≤ 1	ppm	< 1	ppm
Phosphate (PO_4)	≤ 0.5	ppm	< 0.1	ppm
Sulfate (SO_4)	≤ 1.0	ppm	< 1.0	ppm
Sulfite (SO_3)	≤ 0.5	ppm	< 0.5	ppm
Heavy metals (as Pb)	≤ 1	ppm	< 1	ppm
Ag (Silver)	≤ 0.020	ppm	< 0.010	ppm
Al (Aluminium)	≤ 0.050	ppm	0.013	ppm
As (Arsenic)	≤ 0.010	ppm	< 0.010	ppm
Au (Gold)	≤ 0.050	ppm	< 0.010	ppm
B (Boron)	≤ 0.100	ppm	< 0.050	ppm
Ba (Barium)	≤ 0.010	ppm	< 0.010	ppm
Be (Beryllium)	≤ 0.010	ppm	< 0.010	ppm
Bi (Bismuth)	≤ 0.050	ppm	< 0.010	ppm
Ca (Calcium)	≤ 0.500	ppm	< 0.100	ppm
Cd (Cadmium)	≤ 0.010	ppm	< 0.005	ppm
Co (Cobalt)	≤ 0.010	ppm	< 0.005	ppm
Cr (Chromium)	≤ 0.010	ppm	< 0.005	ppm
Cu (Copper)	≤ 0.010	ppm	< 0.005	ppm
Fe (Iron)	≤ 0.100	ppm	< 0.050	ppm
Ga (Gallium)	≤ 0.050	ppm	< 0.010	ppm
Ge (Germanium)	≤ 0.020	ppm	< 0.020	ppm
Hg (Mercury)	≤ 0.010	ppm	< 0.010	ppm
K (Potassium)	≤ 0.100	ppm	< 0.050	ppm
Li (Lithium)	≤ 0.010	ppm	< 0.005	ppm
Mg (Magnesium)	≤ 0.300	ppm	< 0.010	ppm
Mn (Manganese)	≤ 0.010	ppm	< 0.010	ppm
Mo (Molybdenum)	≤ 0.010	ppm	< 0.010	ppm
NH_4 (Ammonium)	≤ 1	ppm	< 1	ppm
Na (Sodium)	≤ 0.500	ppm	0.024	ppm
Ni (Nickel)	≤ 0.020	ppm	< 0.010	ppm
Pb (Lead)	≤ 0.010	ppm	< 0.005	ppm
Pt (Platinum)	≤ 0.100	ppm	< 0.050	ppm
Sn (Tin)	≤ 0.200	ppm	< 0.100	ppm
Sr (Strontium)	≤ 0.010	ppm	< 0.010	ppm
Ti (Titanium)	≤ 0.020	ppm	< 0.010	ppm

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Lampiran 6 Sertifikat Analisis Amonnia Solution 25%

Certificate of Analysis

1.05432.1011 Ammonia solution 25% for analysis EMSURE® ISO,Reag. Ph Eur
Batch Z0948432

	Spec. Values		Batch Values	
Assay (acidimetric, NH_3)	25.0 - 30.0	%	26.5	%
Identity	passes test		passes test	
Appearance of solution	passes test		passes test	
Density (20/20°C)	0.892 - 0.910		0.904	
Carbonate (as CO_2)	≤ 10	ppm	< 10	ppm
Chloride (Cl)	≤ 0.5	ppm	< 0.5	ppm
Phosphate (PO_4)	≤ 0.5	ppm	< 0.5	ppm
Silicon (as SiO_3)	≤ 10	ppm	< 1	ppm
Sulfate (SO_4)	≤ 2	ppm	< 2	ppm
Sulphide (S)	≤ 0.2	ppm	< 0.2	ppm
Pyridine and related substances	≤ 2	ppm	< 2	ppm
Ag (Silver)	≤ 0.020	ppm	< 0.010	ppm
Al (Aluminium)	≤ 0.500	ppm	< 0.200	ppm
Au (Gold)	≤ 0.100	ppm	< 0.020	ppm
Ba (Barium)	≤ 0.050	ppm	< 0.020	ppm
Bi (Bismuth)	≤ 0.100	ppm	< 0.050	ppm
Ca (Calcium)	≤ 0.500	ppm	< 0.200	ppm
Cd (Cadmium)	≤ 0.050	ppm	< 0.020	ppm
Co (Cobalt)	≤ 0.050	ppm	< 0.020	ppm
Cr (Chromium)	≤ 0.050	ppm	< 0.020	ppm
Cu (Copper)	≤ 0.100	ppm	< 0.020	ppm
Fe (Iron)	≤ 0.100	ppm	< 0.050	ppm
Ga (Gallium)	≤ 0.020	ppm	< 0.010	ppm
In (Indium)	≤ 0.020	ppm	< 0.020	ppm
K (Potassium)	≤ 0.500	ppm	< 0.200	ppm
Li (Lithium)	≤ 0.020	ppm	< 0.010	ppm
Mg (Magnesium)	≤ 0.100	ppm	< 0.050	ppm
Mn (Manganese)	≤ 0.050	ppm	< 0.020	ppm
Mo (Molybdenum)	≤ 0.050	ppm	< 0.020	ppm
Na (Sodium)	≤ 0.500	ppm	< 0.200	ppm
Ni (Nickel)	≤ 0.050	ppm	< 0.020	ppm
Pb (Lead)	≤ 0.050	ppm	< 0.020	ppm
Pt (Platinum)	≤ 0.100	ppm	< 0.020	ppm
Sn (Tin)	≤ 0.100	ppm	< 0.020	ppm
Sr (Strontium)	≤ 0.100	ppm	< 0.100	ppm
Ti (Titanium)	≤ 0.100	ppm	< 0.050	ppm
Tl (Thallium)	≤ 0.050	ppm	< 0.010	ppm
Zn (Zinc)	≤ 0.100	ppm	< 0.050	ppm
Oxidizable substances	passes test		passes test	
Substances reducing potassium permanganate (as O)	≤ 5	ppm	< 5	ppm
Residue on ignition (as SO_4)	≤ 10	ppm	< 10	ppm

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Frankfurter Straße 250
64293 Darmstadt, Germany

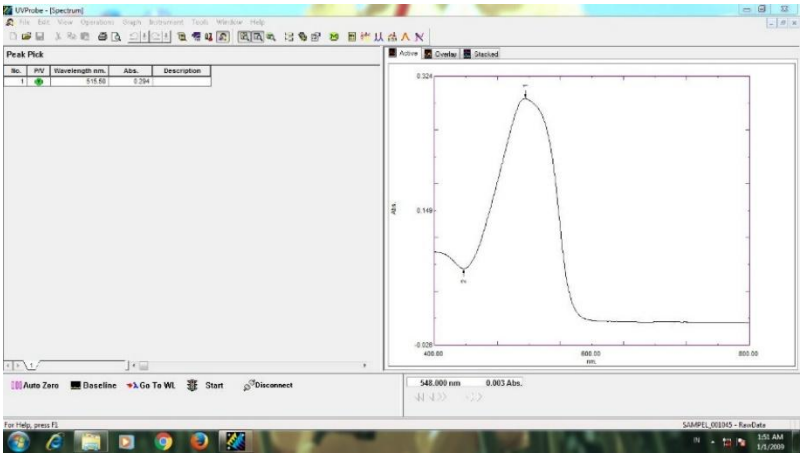
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Lampiran 7 Tujuh Sampel *Lip balm*

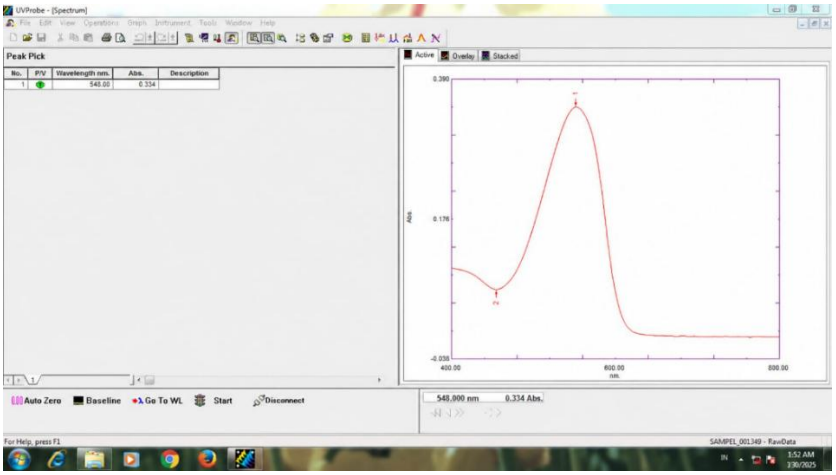


Lampiran 8 Spektrum Sampel

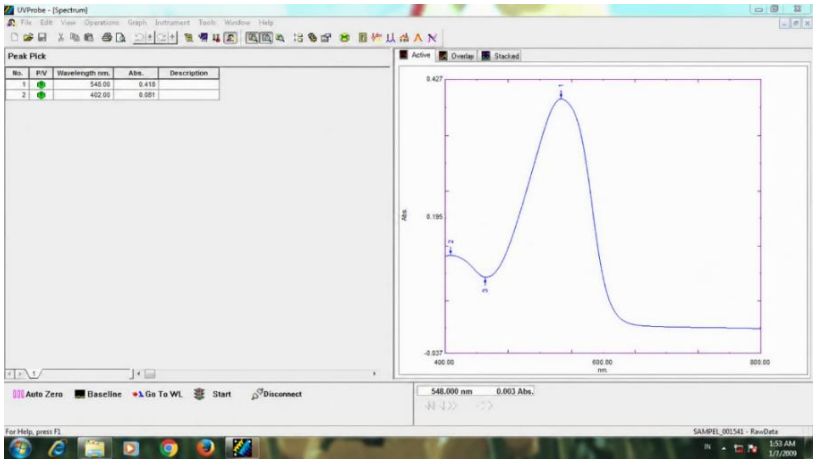
a. Spektrum sampel S1



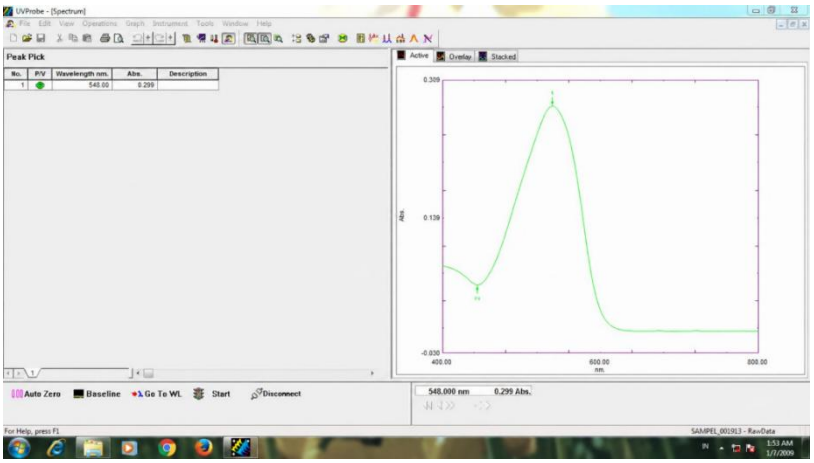
b. Spektrum sampel S2



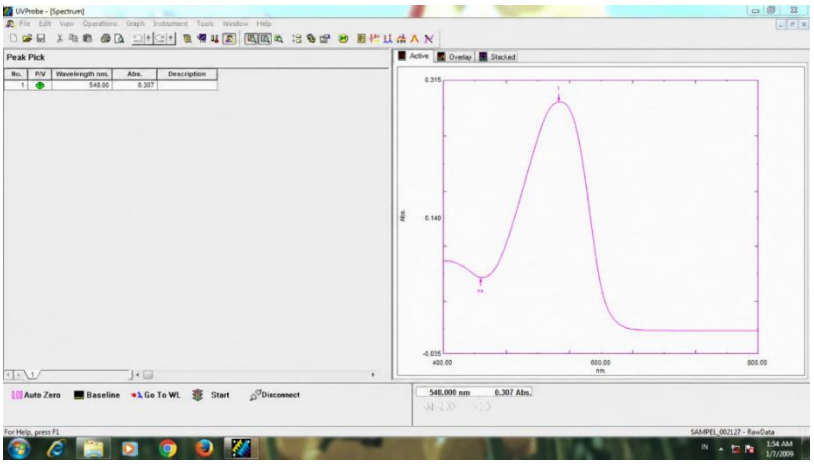
c. Spektrum sampel S3



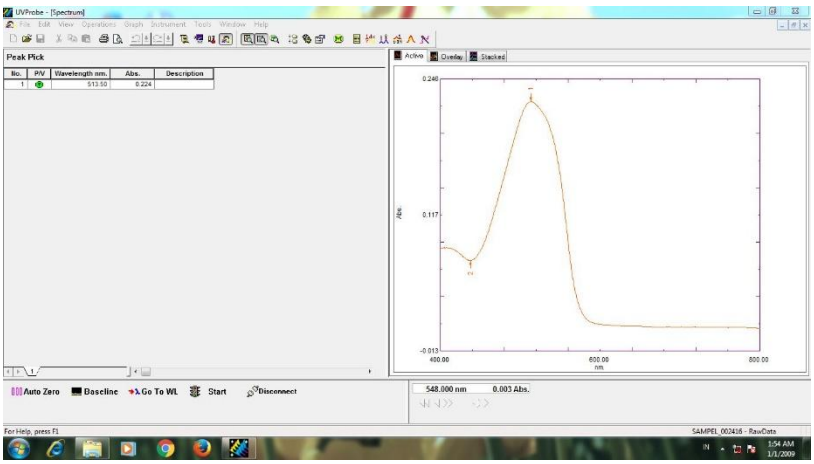
d. Spektrum sampel S4



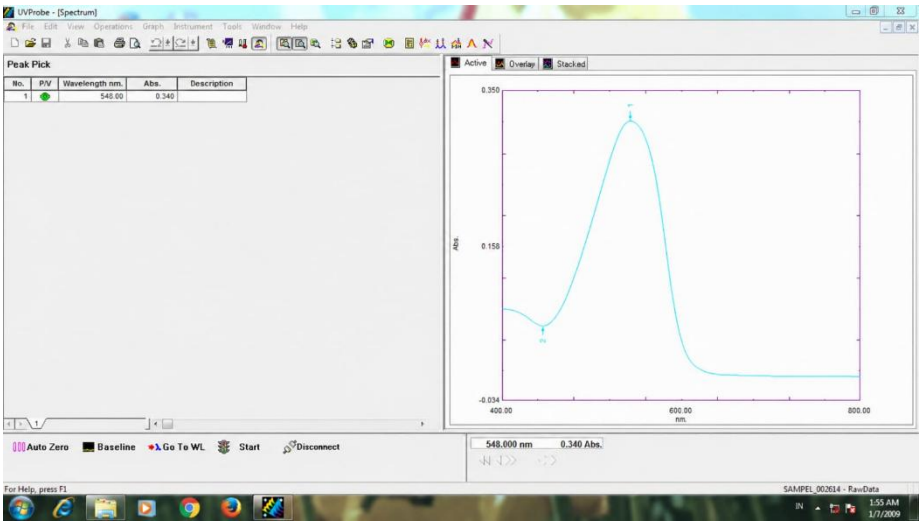
e. Spektrum sampel S5



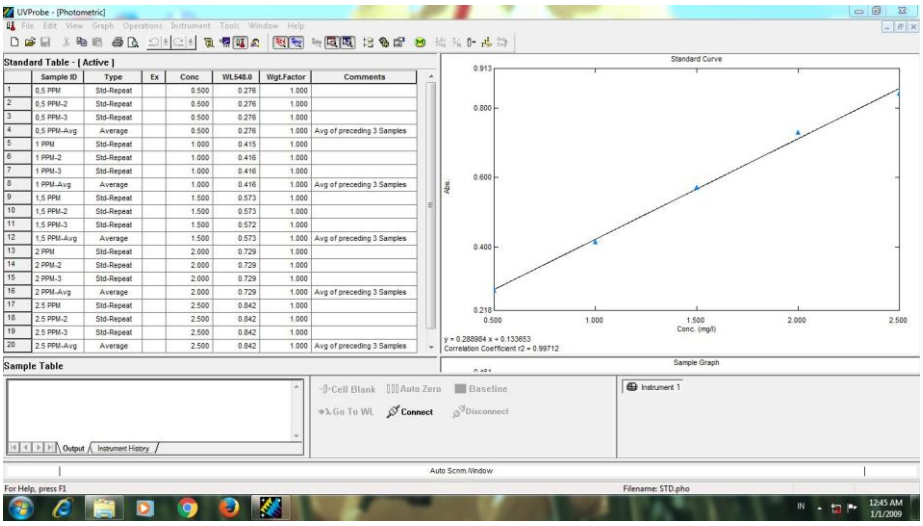
f. Spektrum sampel S6



g. Spektrum Sampel S7



Lampiran 9 Data Absorbansi Larutan Kurva Baku



Lampiran 10 Perhitungan Nilai

1. **Rf larutan standar**

Replikasi 1	Replikasi 2	Replikasi 3	Rata-rata
$\frac{4,6}{6} = 0,76$	$\frac{4,5}{6} = 0,75$	$\frac{4,6}{6} = 0,76$	$\frac{0,76 + 0,75 + 0,76}{3} = 0,75$

2. **Rf sampel 2**

Replikasi 1	Replikasi 2	Replikasi 3	Rata-rata
$\frac{4,5}{6} = 0,75$	$\frac{4,4}{6} = 0,73$	$\frac{4,4}{6} = 0,73$	$\frac{0,75 + 0,73 + 0,73}{3} = 0,73$

3. **Rf sampel 3**

Replikasi 1	Replikasi 2	Replikasi 3	Rata-rata
$\frac{4,4}{6} = 0,73$	$\frac{4,4}{6} = 0,73$	$\frac{4,5}{6} = 0,75$	$\frac{0,73 + 0,73 + 0,75}{3} = 0,73$

4. **Rf sampel 4**

Replikasi 1	Replikasi 2	Replikasi 3	Rata-rata
$\frac{4,3}{6} = 0,71$	$\frac{4,3}{6} = 0,71$	$\frac{4,4}{6} = 0,73$	$\frac{0,71 + 0,71 + 0,73}{3} = 0,71$

5. **Rf sampel 5**

Replikasi 1	Replikasi 2	Replikasi 3	Rata-rata
$\frac{4,5}{6} = 0,75$	$\frac{4,4}{6} = 0,73$	$\frac{4,5}{6} = 0,75$	$\frac{0,75 + 0,73 + 0,75}{3} = 0,74$

6. **Rf sampel 7**

Replikasi 1	Replikasi 2	Replikasi 3	Rata-rata
$\frac{4,4}{6} = 0,73$	$\frac{4,5}{6} = 0,75$	$\frac{4,5}{6} = 0,75$	$\frac{0,73 + 0,75 + 0,75}{3} = 0,73$

Lampiran 11 Perhitungan Larutan Standar Rhodamin B

1. **Larutan Standar 1000 Ppm**

   1 Ppm = $\frac{mg}{L}$

   1000 Ppm = $\frac{1000\ mg}{L}$

   1000 Ppm = $\frac{50\ mg}{0.05\ L}$

   = $\frac{50\ mg}{50\ mL}$

2. **Larutan Standar 1000 Ppm ke 100 Ppm**

   $V_1 \times M_1 = V_2 \times M_2$

   $V_1 = \frac{V_2 \times M_2}{M_1}$

   $V_1 = \frac{50 \times 100}{1000}$

   $V_1 = 5\ mL$

3. **Perhitungan Konsentrasi Larutan Kurva Baku Rhodamin B**

   a. Larutan 0,5 Ppm

   $V_1 \times M_1 = V_2 \times M_2$

   $V_1 = \frac{V_2 \times M_2}{M_1}$

   $V_1 = \frac{0{,}5 \times 10}{100}$

   $V_1 = 0{,}05\ mL = 50\ \mu L$

   b. Larutan 1 Ppm

   $V_1 \times M_1 = V_2 \times M_2$

   $V_1 = \frac{V_2 \times M_2}{M_1}$

   $V_1 = \frac{1 \times 10}{100}$

   $V_1 = 0{,}1\ mL = 100\ \mu L$

   c. Larutan 1,5 Ppm

   $V_1 \times M_1 = V_2 \times M_2$

   $V_1 = \frac{V_2 \times M_2}{M_1}$

   $V_1 = \frac{1{,}5 \times 10}{100}$

   $V_1 = 0{,}15\ mL = 150\ \mu L$

   d. Larutan 2 Ppm

   $V_1 \times M_1 = V_2 \times M_2$

   $V_1 = \frac{V_2 \times M_2}{M_1}$

   $V_1 = \frac{2 \times 10}{100}$

   $V_1 = 0{,}2\ mL = 200\ \mu L$

   e. Larutan 2,5 Ppm

   $V_1 \times M_1 = V_2 \times M_2$

   $V_1 = \frac{V_2 \times M_2}{M_1}$

   $V_1 = \frac{2{,}5 \times 10}{100}$

   $V_1 = 0{,}25\ mL = 250\ \mu L$

Lampiran 12 Perhitungan Linearitas

No.	Konsentrasi Ppm (x)	Absorbansi	Rata- rata Absorbansi	X^2	Y^2	XY
1.	0,5 Ppm	0,276	0,276	0,25	0,076176	0,138
		0,276				
		0,276				
2.	1 Ppm	0,415	0,416	1	0,173056	0,416
		0,416				
		0,416				
3.	1,5 Ppm	0,573	0,573	2,25	0,328329	0,8595
		0,573				
		0,572				
4.	2 Ppm	0,729	0,729	4	0,531441	1,458
		0,729				
		0,729				
5.	2,5 Ppm	0,842	0,842	6,25	0,708964	2,105
		0,842				
		0,042				
∑	7,5		2,836	13,75	1,817966	4,9765

Perhitungan $r = \frac{n \times (\sum XY) - (\sum X)\,(\sum Y)}{\sqrt{n\,(\sum X^2) - (\sum X)^2} \times \sqrt{n\,(\sum Y^2) - (\sum Y)^2}}$

$$r = \frac{5 \times (4{,}9765) - (7{,}5)\,.\,(2{,}836)}{\sqrt{5\,(13{,}75) - (56{,}25)} \times \sqrt{5\,(1{,}817966) - (8{,}042896)}}$$

$$r = \frac{24{,}8825 - 21{,}27}{\sqrt{68{,}75 - 56{,}25} \times \sqrt{9{,}08983 - 8{,}042896}}$$

$$r = \frac{3{,}6125}{\sqrt{12{,}5} \times \sqrt{1{,}046934}}$$

$$r = \frac{3{,}6125}{3{,}5355339059 \times 1{,}0231979281}$$

$$r = \frac{3{,}6125}{3{,}617550967}$$

$$r = 0{,}998603761$$

Lampiran 13 Perhitungan Nilai Presisi

Konsentrasi (Ppm)	**Absorbansi**	**Rata – rata Absorbansi**	**SD**	**% RSD**
1,5	0,548	0,544	0,008485281	1,56%
	0,532			
	0,554			
	0,536			
	0,550			
	0,544			

Perhitungan :

- $\boldsymbol{SD} = \sqrt{\frac{\sum(\boldsymbol{X}-\overline{\boldsymbol{X}})^2}{\boldsymbol{N}-\boldsymbol{1}}}$
  $= \sqrt{\frac{0{,}00036}{\boldsymbol{6-1}}}$
  $= \sqrt{\frac{0{,}00036}{\boldsymbol{5}}}$
  $= \sqrt{0.000072}$
  $= 0{,}008485281$

- $\boldsymbol{RSD} = \frac{\boldsymbol{SD}}{\overline{\boldsymbol{X}}} \times 100\%$
  $= \frac{\boldsymbol{SD}}{\boldsymbol{Rata-rata\ Absorbansi}} \times 100\%$
  $= \frac{0{,}008485281}{0{,}544} \times 100\%$
  $= 1{,}56\%$

Lampiran 14 Perhitungan Nilai Akurasi

No.	Konsentrasi (Ppm)	Absorbansi	Konsentrasi Terukur	% *Recovery*	Rata – rata % *Recovery*
1.	0,5	0,276	0,496527778	99,31%	99,31%
		0,276	0,496527778	99,31%	
		0,276	0,496527778	99,31%	
2.	1,5	0,573	1,527777778	101.85%	101,74%
		0,573	1,527777778	101,85%	
		0,572	1,524305556	101,62%	
3.	2,5	0,842	2,461805556	98,47%	98,47%
		0,842	2,461805556	98,47%	
		0,842	2,461805556	98,47%	

Persamaan Regresi Linear y = 0,288x + 0,133

% Recovery = $\frac{Konsentrasi\ yang\ Diperoleh}{Konsentrasi\ Sebenarnya} \times 100\%$

Perhitungan :

1. **Konsentrasi 0,5 Ppm**

   - Replikasi I

     y = 0,288x + 0,133

     x = $\frac{0,276 - 0,133}{0,288}$

     x = $0,4965277778\ Ppm$

     % Recovery = $\frac{0,4965277778}{0,5} \times 100\%$

     = $99,31\%$

   - Replikasi II

     y = 0,288x + 0,133

     x = $\frac{0,276 - 0,133}{0,288}$

     x = $0,496527778\ Ppm$

     % Recovery = $\frac{0,496527778}{0,5} \times 100\%$

     = $99,31\%$

   - Replikasi III

     y = 0,288x + 0,133

     x = $\frac{0,276 - 0,133}{0,288}$

x = 0,4965277778 Ppm

% Recovery = $\frac{0,4965277778}{0,5} \times 100\%$

= 99,31%

2. Konsentrasi 1,5 Ppm

- Replikasi I

y = 0,288x + 0,133

x = $\frac{0,573 - 0,133}{0,288}$

x = 1,527777778 Ppm

% Recovery = $\frac{1,527777778}{1,5} \times 100\%$

= 101,85%

- Replikasi II

y = 0,288x + 0,133

x = $\frac{0,573 - 0,133}{0,288}$

x = 1,527777778 Ppm

% Recovery = $\frac{1,527777778}{1,5} \times 100\%$

= 101,85%

- Replikasi III

y = 0,288x + 0,133

x = $\frac{0,572 - 0,133}{0,288}$

x = 1,524305556 Ppm

% Recovery = $\frac{1,524305556}{1,5} \times 100\%$

= 101,62%

3. Konsentrasi 2,5 Ppm

- Replikasi I

y = 0,288x + 0,133

x = $\frac{0,842 - 0,133}{0,288}$

x = 2,461805556 Ppm

% Recovery = $\frac{2,461805556}{2,5} \times 100\%$

= 98,47%

- Replikasi II

  y = 0,288x + 0,133

  $x = \frac{0,842 - 0,133}{0,288}$

  $x = 2,461805556\ Ppm$

  $\%\ \text{Recovery} = \frac{2,461805556}{2,5} \times 100\%$

  $= 98,47\%$

- Replikasi III

  y = 0,288x + 0,133

  $x = \frac{0,842 - 0,133}{0,288}$

  $x = 2,461805556\ Ppm$

  $\%\ \text{Recovery} = \frac{2,461805556}{2,5} \times 100\%$

  $= 98,47\%$

Lampiran 15 Perhitungan Nilai Lod dan LoQ

No.	Konsentrasi	Absorbansi (Y)	Konsntrasi Terukur (Y′)	(Y - Y′)	(Y - Y′)²
1.	0,5	0,276	0,27805	-0,00205	0,00000420
2.	1	0,416	0,42250	-0,0065	0,00004225
3.	1,5	0,573	0,56695	0,00605	0,00003660
4.	2	0,729	0,7114	0,0176	0,00030976
5.	2,5	0,842	0,85585	-0,01385	0,00019182
Jumlah					0,0005846375
SD					0,013959913
LoD					0,144
LoQ					0,483

1. Perhitungan Nilai Y′ :

- **Konsentrasi 0,5 Ppm**

  y = 0,2889x + 0,1336

  y = 0,2889 (0,5) + 0,1336

  y = 0,2889 (0,5) + 0,1336

  y = 0,27805

- **Konsentrasi 1 Ppm**

  y = 0,2889x + 0,1336

  y = 0,2889 (1) + 0,1336

  y = 0,2889 (1) + 0,1336

  y = 0,42250

- **Konsentrasi 1,5 Ppm**

  y = 0,2889x + 0,1336

  y = 0,2889 (1,5) + 0,1336

  y = 0,2889 (1,5) + 0,1336

  y = 0,56695

- **Konsentrasi 2 Ppm**

  y = 0,2889x + 0,1336

  y = 0,2889 (2) + 0,1336

  y = 0,2889 (2) + 0,1336

  y = 0,7114

- **Konsentrasi 2,5 Ppm**

  y = 0,2889x + 0,1336

  y = 0,2889 (2,5) + 0,1336

  y = 0,2889 (2,5) + 0,1336

  y = 0,85585

2. Perhitungan Standar Deviasi Residual (SD)

$$SD = \sqrt{\frac{\sum(Y-Y')^2}{n-2}}$$

$$SD = \sqrt{\frac{0{,}0005846375}{5-2}}$$

$$SD = \sqrt{\frac{0{,}0005846375}{3}}$$

$$SD = \sqrt{0{,}0001948792}$$

$$SD = 0{,}013959913$$

3. Perhitungan Lod dan LoQ

- LoD

  $$LoD = \frac{3\times SD}{Slope}$$

  $$LoD = \frac{3\times 0{,}013959823}{0{,}2889}$$

  $$LoD = \frac{0{,}04187}{0{,}2889}$$

  $$LoD = 0{,}144 \text{ Ppm}$$

- %

  0,144 mg/1 L

  0,000144 g/1000 ml

  0,0000144 g/100 ML

  0,0000144%

- LoQ

  $$LoQ = \frac{10\times SD}{Slope}$$

  $$LoQ = \frac{10\times 0{,}013959823}{0{,}2889}$$

  $$LoD = \frac{0{,}13958}{0{,}2889}$$

  $$LoD = 0{,}483 \text{ Ppm}$$

- %

  0,483 mg/1 L

  0,000483 g/1000 ml

  0,0000483 g/100 ML

  0,0000483%

Lampiran 16 Perhitungan Kadar Rhodamin B

$$\% \text{ Kadar} = \frac{X \; x \; V(L) \; x \; Fp}{Berat \; Sampel \; (mg)} \times 100\%$$

a. Sampel 2

- Replikasi I

  y = 0,2889x + 0,1336

  $x = \frac{0,334 - 0,1336}{0,2889}$

  x = 0,693

  $\% \text{ Kadar} = \frac{0,693 \; x \; 0,05 \; L \; x \; 5}{1000} \times 100\%$

  $\% \text{ Kadar} = 0,0173 \; \%$

- Replikasi II

  y = 0,2889x + 0,1336

  $x = \frac{0,336 - 0,1336}{0,2889}$

  x = 0,700

  $\% \text{ Kadar} = \frac{0,700 \; x \; 0,05 \; L \; x \; 5}{1000} \times 100\%$

  $\% \text{ Kadar} = 0,0175 \; \%$

- Replikasi III

  y = 0,2889x + 0,1336

  $x = \frac{0,338 - 0,1336}{0,2889}$

  x = 0,708

  $\% \text{ Kadar} = \frac{0,708 \; x \; 0,05 \; L \; x \; 5}{1000} \times 100\%$

  $\% \text{ Kadar} = 0,0177 \; \%$

  Rata-rata = $\frac{0,0173 + 0,0175 + 0,0177}{3} = 0,0175\%$

- $\frac{0,693 + 0,700 + 0,708}{3} = 0,700 \; Ppm$

  0,700 mg/1 L

  0,0007 g/1000 ml

  0,00007 g/100 ml

  0,00007%

b. Sampel 3

- Replikasi I

  y = 0,2889x + 0,1336

  $x = \frac{0,419 - 0,1336}{0,2889}$

  x = 0,987

  $\% \text{ Kadar} = \frac{0,987 \; x \; 0,05 \; L \; x \; 5}{1000} \times 100\%$

  $\% \text{ Kadar} = 0,0246\%$

- Replikasi II

y = 0,2889x + 0,1336

x = $\frac{0,420 - 0,1336}{0,2889}$

x = 0,992

% Kadar = $\frac{0,992 \ x \ 0,05 \ L \ x \ 5}{1000} \times 100\%$

% Kadar = 0,0248%

- Replikasi III

y = 0,2889x + 0,1336

x = $\frac{0,421 - 0,1336}{0,2889}$

x = 0,996

% Kadar = $\frac{0,996 \ x \ 0,05 \ L \ x \ 5}{1000} \times 100\%$

% Kadar = 0,0249%

Rata-rata = $\frac{0,0246 + 0,0248 + 0,0249}{3} = 0,0247\ \%$

- $\frac{0,987 + 0,992 + 0,996}{3} = 0,991\ Ppm$

0,991 mg/1 L

0,000991 g/1000 ml

0,0000991 g/100 ml

0,0000991%

c. Sampel 4

- Replikasi I

y = 0,2889x + 0,1336

x = $\frac{0,229 - 0,1336}{0,2889}$

x = 0,572

% Kadar = $\frac{0,572 \ x \ 0,05 \ L \ x \ 5}{1000} \times 100\%$

% Kadar = 0,0143 %

- Replikasi II

y = 0,2889x + 0,1336

x = $\frac{0,301 - 0,1336}{0,2889}$

x = 0,580

% Kadar = $\frac{0,580 \ x \ 0,05 \ L \ x \ 5}{1000} \times 100\%$

% Kadar = 0,0145%

- Replikasi III

y = 0,2889x + 0,1336

x = $\frac{0,303 - 0,1336}{0,2889}$

x = 0,588

% Kadar = $\frac{0,588 \ x \ 0,05 \ L \ x \ 5}{1000} \times 100\%$

% Kadar = 0,0147%

Rata-rata = $\frac{0,0143 + 0,0145 + 0,0147}{3} = 0,0145\ \%$

- $\frac{0,572 + 0,580 + 0,588}{3} = 0,580\ Ppm$

0,588 mg/1 L
0,000588 g/1000 ml
0,0000588 g/100 ml
0,0000588%

d. Sampel 5
- Replikasi I

y = 0,2889x + 0,1336
x = $\frac{0,307 - 0,1336}{0,2889}$
x = 0,600
% Kadar = $\frac{0,600\ x\ 0,05\ L\ x\ 5}{1000} \times 100\%$
% Kadar = 0,0150 %

- Replikasi II

y = 0,2889x + 0,1336
x = $\frac{0,308 - 0,1336}{0,2889}$
x = 0,604
% Kadar = $\frac{0,604\ x\ 0,05\ L\ x\ 5}{1000} \times 100\%$
% Kadar = 0,0151%

- Replikasi III

y = 0,2889x + 0,1336
x = $\frac{0,310 - 0,1336}{0,2889}$
x = 0,612
% Kadar = $\frac{0,612\ x\ 0,05\ L\ x\ 5}{1000} \times 100\%$
% Kadar = 0,01537%
Rata-rata = $\frac{0,0150 + 0,0151 + 0,0152}{3} = 0,0151\ \%$

- $\frac{0,600 + 0,604 + 0,612}{3} = 0,605\ Ppm$

0,605 mg/1 L
0,000605 g/1000 ml
0,0000605 g/100 ml
0,0000605%

e. Sampel 7
- Replikasi I

y = 0,2889x + 0,1336
x = $\frac{0,304 - 0,1336}{0,2889}$
x = 0,714

% Kadar $= \frac{0{,}714\ x\ 0{,}05\ L\ x\ 5}{1000} \times 100\%$

% Kadar $= 0{,}0143\ \%$

- Replikasi II

  y = 0,2889x + 0,1336

  x = $\frac{0{,}314 - 0{,}1336}{0{,}2889}$

  x = 0,720

  % Kadar $= \frac{0{,}720\ x\ 0{,}05\ L\ x\ 5}{1000} \times 100\%$

  % Kadar $= 0{,}0180\%$

- Replikasi III

  y = 0,2889x + 0,1336

  x = $\frac{0{,}345 - 0{,}1336}{0{,}2889}$

  x = 0,732

  % Kadar $= \frac{0{,}732\ \ x\ 0{,}05\ L\ x\ 5}{1000} \times 100\%$

  % Kadar $= 0{,}0183\%$

  Rata-rata = $\frac{0{,}0178 + 0{,}0180 + 0{,}0183}{3} = 0{,}0180\ \%$

- $\frac{0{,}714 + 0{,}720 + 0{,}732}{3} = 0{,}722\ Ppm$

  0,722 mg/1 L

  0,000722 g/1000 ml

  0,0000722 g/100 ml

  0,0000722%

Lampiran 17 Analisis Deskriptif

Descriptives

	Kode Sampel Lip Balm			Statistic	Std. Error
Kadar Sampel Rhodamin B (%)	S2	Mean		.017500	.0001155
		95% Confidence Interval for Mean	Lower Bound	.017003	
			Upper Bound	.017997	
		5% Trimmed Mean		.	
		Median		.017500	
		Variance		.000	
		Std. Deviation		.0002000	
		Minimum		.0173	
		Maximum		.0177	
		Range		.0004	
		Interquartile Range		.	
		Skewness		.000	1.225
		Kurtosis		.	.
	S3	Mean		.024767	.0000882
		95% Confidence Interval for Mean	Lower Bound	.024387	
			Upper Bound	.025146	
		5% Trimmed Mean		.	
		Median		.024800	
		Variance		.000	
		Std. Deviation		.0001528	
		Minimum		.0246	
		Maximum		.0249	
		Range		.0003	
		Interquartile Range		.	
		Skewness		-.935	1.225
		Kurtosis		.	.
	S4	Mean		.014500	.0001155
		95% Confidence Interval for Mean	Lower Bound	.014003	
			Upper Bound	.014997	
		5% Trimmed Mean		.	
		Median		.014500	
		Variance		.000	
		Std. Deviation		.0002000	
		Minimum		.0143	
		Maximum		.0147	
		Range		.0004	
		Interquartile Range		.	
		Skewness		.000	1.225
		Kurtosis		.	.
	S5	Mean		.015133	.0000882
		95% Confidence Interval for Mean	Lower Bound	.014754	
			Upper Bound	.015513	
		5% Trimmed Mean		.	
		Median		.015100	
		Variance		.000	
		Std. Deviation		.0001528	
		Minimum		.0150	
		Maximum		.0153	
		Range		.0003	
		Interquartile Range		.	
		Skewness		.935	1.225
		Kurtosis		.	.
	S7	Mean		.018033	.0001453
		95% Confidence Interval for Mean	Lower Bound	.017408	
			Upper Bound	.018658	
		5% Trimmed Mean		.	
		Median		.018000	
		Variance		.000	
		Std. Deviation		.0002517	
		Minimum		.0178	
		Maximum		.0183	
		Range		.0005	
		Interquartile Range		.	
		Skewness		.586	1.225
		Kurtosis		.	.

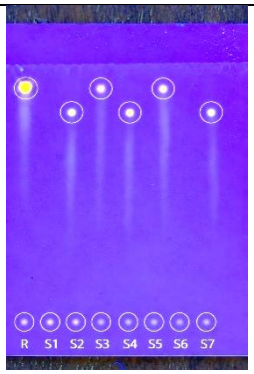
Lampiran 18 Analisis Data Statistik Normalitas

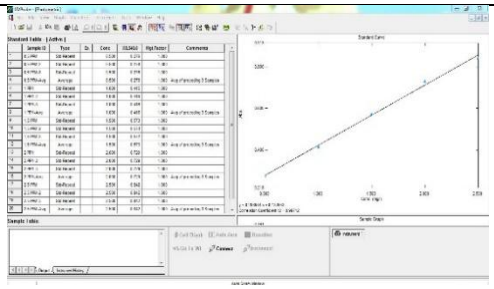
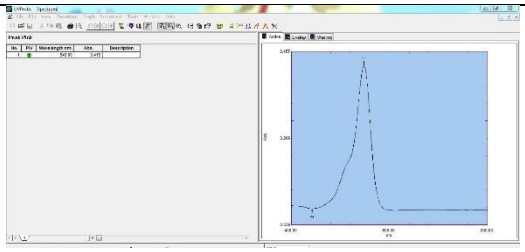
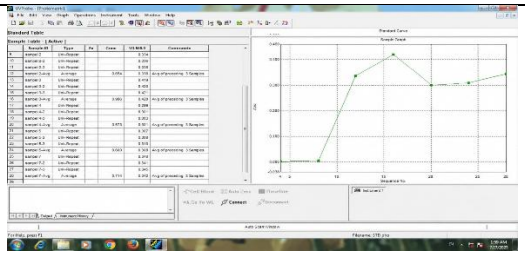
Tests of Normality

		Kolmogorov-Smirnov[a]			Shapiro-Wilk		
	Kode Sampel Lip Balm	Statistic	df	Sig.	Statistic	df	Sig.
Kadar Sampel Rhodamin B (%)	S2	.175	3	.	1.000	3	1.000
	S3	.253	3	.	.964	3	.637
	S4	.175	3	.	1.000	3	1.000
	S5	.253	3	.	.964	3	.637
	S7	.219	3	.	.987	3	.780

a. Lilliefors Significance Correction

Lampiran 19 Kegiatan Perlakuan

No.	Gambar	Perlakuan
1.		Pengambilan sampel *lip balm*
2.		Pembuatan larutan baku Rhodamin B
3.		Pembuatan larutan sampel *lip balm*
4.		Melakukan penotolan pada plat KLT
5.		Hasil perlakuan KLT

No.	Gambar	Perlakuan
6.		Pengkuran absorbansi larutan standar Rhodamin B
7.		Pengkuran panjang gelombang maksimum Rhodamin B
8.		Pengkuran absorbansi larutan sampel