


## LAMPIRAN

### Lampiran 1. Surat Keterangan Penelitian



**UNIVERSITAS SAHID SURAKARTA**  
Jl. Adi Sucipto 154, Solo 57144, Indonesia  
Tel. +62 - (0)271 - 743493, 743494, Fax. +62 - (0)271 - 742047  
www.usahidsolo.ac.id

---

**SURAT KETERANGAN PENELITIAN**  
004/FAR/FSTK/Usahid-Ska/V/2023

Assalamualaikum Wr. Wb.

Dengan surat ini Kami memberitahukan bahwa mahasiswa dibawah ini:

Nama : Afyah Abdul Muluk  
NIM : 2021142003  
Prodi : S1 Farmasi  
Instansi : Universitas Sahid Surakarta


Telah melaksanakan penelitian di Laboratorium Farmasi Universitas Sahid Surakarta mulai 27 Februari - 3 Maret 2023 dengan judul penelitian **"Penetapan Kadar Formalin pada Mie Basah yang dijual di Pasar Deringharjo dan Pasar Kotagede Yogyakarta dengan Metode Spektrofotometri UV - Vis"**.


Demikian surat keterangan ini dibuat untuk dipergunakan semestinya.  
Wassalamualaikum Wr. Wb.

Surakarta, 11 Mei 2023

Mengetahui  
Kep. Lab. Farmasi

Ka. Lab. Farmasi

  
Kholilul Haidar, S.Farm., M.Sc.  
NIDN. 0612129002

  
Hadifah Dini, S.Pd., M.Sc.  
NIDN. 0612129002

**Lampiran 2. Sampel Mie Basah**



**Lampiran 3. Perhitungan pembuatan larutan induk 60 ppm dan seri konsentrasi 0,5 – 4 ppm**

- a. Pembuatan larutan induk 6000 ppm dari larutan stok formalin dengan konsentrasi 37 % (370.000 ppm)

$$M_1 \times V_1 = M_2 \times V_2$$

$$370.000 \text{ ppm} \times V_1 = 6000 \text{ ppm} \times 100 \text{ ml}$$

$$V_1 = \frac{6000 \text{ ppm} \times 100 \text{ ml}}{370.000 \text{ ppm}}$$

$$= 1,62 \text{ ml}$$

- b. Pembuatan larutan induk formalin 60 ppm dari larutan stok formalin 6000 ppm

$$M_1 \times V_1 = M_2 \times V_2$$

$$6000 \text{ ppm} \times V_1 = 60 \text{ ppm} \times 100 \text{ ml}$$

$$V_1 = \frac{60 \text{ ppm} \times 100 \text{ ml}}{6.000 \text{ ppm}}$$

$$= 1 \text{ ml}$$

Pembuatan larutan formalin seri konsentrasi 0,5 – 4 ppm

- a. Pembuatan larutan formalin seri konsentrasi 0,5 ppm

$$M_1 \times V_1 = M_2 \times V_2$$

$$60 \text{ ppm} \times V_1 = 0,5 \text{ ppm} \times 50 \text{ ml}$$

$$V_1 = \frac{0,5 \text{ ppm} \times 50 \text{ ml}}{60 \text{ ppm}}$$

$$= 0,42 \text{ ml}$$

- b. Pembuatan larutan formalin seri konsentrasi 1 ppm

$$M_1 \times V_1 = M_2 \times V_2$$

$$60 \text{ ppm} \times V_1 = 1 \text{ ppm} \times 50 \text{ ml}$$

$$V_1 = \frac{1 \text{ ppm} \times 50 \text{ ml}}{60 \text{ ppm}}$$

$$= 0,83 \text{ ml}$$

- c. Pembuatan larutan seri konsentrasi 2 ppm

$$M_1 \times V_1 = M_2 \times V_2$$

$$60 \text{ ppm} \times V_1 = 2 \text{ ppm} \times 50 \text{ ml}$$

$$V_1 = \frac{2 \text{ ppm} \times 50 \text{ ml}}{60 \text{ ppm}}$$

$$= 1,7 \text{ ml}$$

- d. Pembuatan larutan seri konsentrasi 3 ppm

$$M_1 \times V_1 = M_2 \times V_2$$

$$60 \text{ ppm} \times V_1 = 3 \text{ ppm} \times 50 \text{ ml}$$

$$V_1 = \frac{3 \text{ ppm} \times 50 \text{ ml}}{60 \text{ ppm}}$$

$$= 2,5 \text{ ml}$$

e. Pembuatan larutan seri konsentrasi 4 ppm

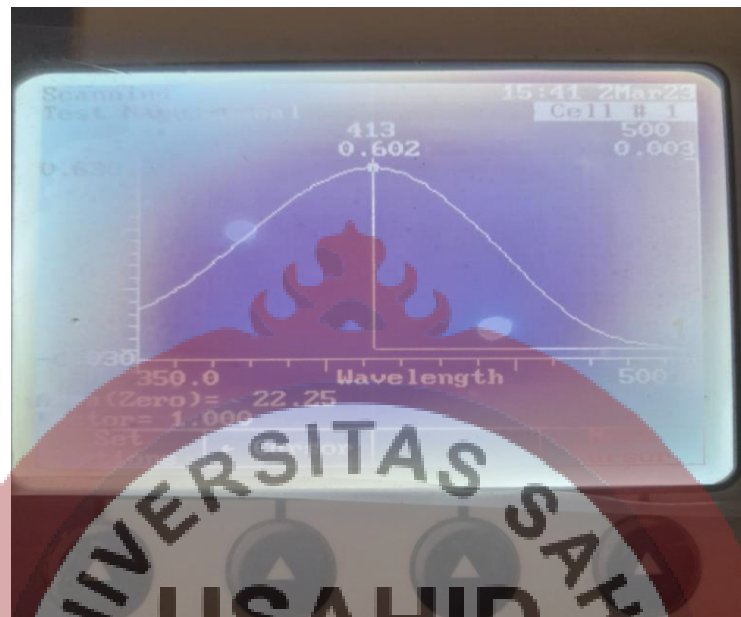
$$M_1 \times V_1 = M_2 \times V_2$$

$$60 \text{ ppm} \times V_1 = 4 \text{ ppm} \times 50 \text{ ml}$$

$$V_1 = \frac{4 \text{ ppm} \times 50 \text{ ml}}{60 \text{ ppm}}$$

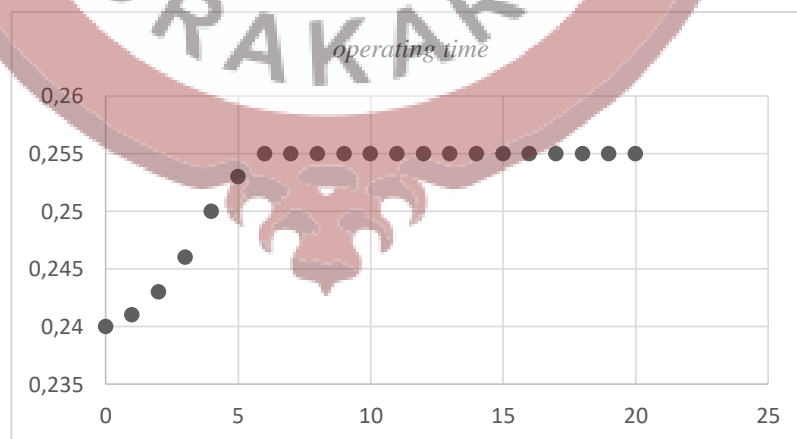
$$= 3,33 \text{ ml}$$



**Lampiran 4. Panjang gelombang maksimum formalin**

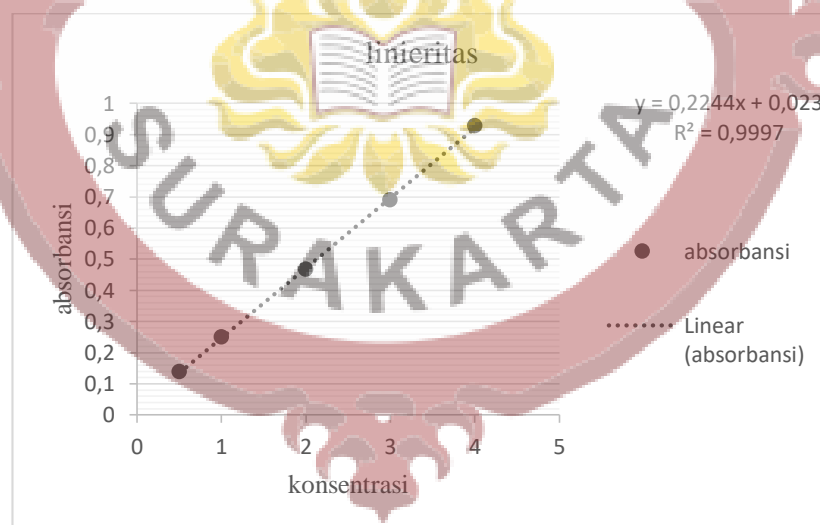
**Lampiran 5. Operating Time**

Waktu	Absorbansi
0	0,240
1	0,241
2	0,243
3	0,246
4	0,250
5	0,253
6	0,255
7	0,255
8	0,255
9	0,255
10	0,255
11	0,255
12	0,255
13	0,255
14	0,255
15	0,255
16	0,255
17	0,255
18	0,255
19	0,255
20	0,255



### Lampiran 6. Uji Linieritas

Konsentrasi (ppm)	Replikasi	Absorbansi (A)	Rata-rata absorbansi (A)	Persamaan regresi linear
0,5	1	0,138	0,138	$y = 0,2244x + 0,023$ $R^2 = 0,9997$
	2	0,135		
	3	0,141		
1	1	0,245	0,249	
	2	0,250		
	3	0,254		
2	1	0,470	0,468	
	2	0,466		
	3	0,469		
3	1	0,686	0,689	
	2	0,690		
	3	0,692		
4	1	0,921	0,927	
	2	0,926		
	3	0,934		



**Lampiran 7. Uji Presisi**

Replikasi	Konsentrasi (ppm)	Absorbansi (A)
1	1	0,243
2	1	0,245
3	1	0,246
4	1	0,244
5	1	0,248
6	1	0,247
Rata-rata		0,245
SD (%)		0,0019
RSD (%)		0,775

$$SD = \sqrt{\frac{\sum(x_2 - x_1)^2}{N-1}}$$

$$= \sqrt{\frac{0,000019}{5}}$$

$$= 0,0019$$

$$RSD = \frac{SD}{\bar{x}} \times 100 \%$$

$$= \frac{0,0019}{0,245} \times 100\%$$

$$= 0,775 \%$$



### Lampiran 8. Uji Akurasi

Konsentrasi (ppm)	Replikasi	Absorbansi	% recovery	Rata-rata % recovery	SD	RSD
1	1	0,244	98,4	100,3	1,05	1,04
	2	0,249	100,7			
	3	0,252	102,0			
2	1	0,471	99,8	100,2	0,452	0,451
	2	0,475	100,7			
	3	0,473	100,2			
3	1	0,684	98,1	98,6	0,556	0,56
	2	0,688	98,7			
	3	0,691	99,2			

Persamaan garis linier  $y = 0,2244x + 0,023$

$$\% \text{ Recovery} = \frac{\text{Konsentrasi yang diperoleh}}{\text{Konsentrasi yang sebenarnya}} \times 100\%$$

a. Konsentrasi 1 ppm

$$\begin{aligned} \text{Replikasi 1} &= \frac{0,244 - 0,023}{0,2244} \\ &= \frac{0,984 \text{ ppm}}{1 \text{ ppm}} \times 100\% \\ &= 98,4\% \end{aligned}$$

$$\begin{aligned} \text{Replikasi 2} &= \frac{0,249 - 0,023}{0,2244} \\ &= \frac{1,007 \text{ ppm}}{1 \text{ ppm}} \times 100\% \\ &= 100,7\% \end{aligned}$$

$$\begin{aligned} \text{Replikasi 3} &= \frac{0,252 - 0,023}{0,2244} \\ &= \frac{1,020 \text{ ppm}}{1 \text{ ppm}} \times 100\% \\ &= 102,0\% \end{aligned}$$

b. Konsentrasi 2 ppm

$$\begin{aligned} \text{Replikasi 1} &= \frac{0,471 - 0,023}{0,2244} \\ &= \frac{1,996 \text{ ppm}}{2 \text{ ppm}} \times 100\% \\ &= 99,8\% \end{aligned}$$

$$\text{Replikasi 2} = \frac{0,475 - 0,023}{0,2244}$$

$$= \frac{2,014 \text{ ppm}}{2 \text{ ppm}} \times 100 \%$$

$$= 100,7 \%$$

$$\text{Replikasi 3} = \frac{0,473-0,023}{0,2244}$$

$$= \frac{2,005 \text{ ppm}}{2 \text{ ppm}} \times 100 \%$$

$$= 100,2 \%$$

c. Konsentrasi 3 ppm

$$\text{Replikasi 1} = \frac{0,684-0,023}{0,2244}$$

$$= \frac{2,945 \text{ ppm}}{3 \text{ ppm}} \times 100 \%$$

$$= 98,1 \%$$

$$\text{Replikasi 2} = \frac{0,688-0,023}{0,2244}$$

$$= \frac{2,963 \text{ ppm}}{3 \text{ ppm}} \times 100 \%$$

$$= 98,7 \%$$

$$\text{Replikasi 3} = \frac{0,691-0,023}{0,2244}$$

$$= \frac{2,976 \text{ ppm}}{3 \text{ ppm}} \times 100 \%$$

$$= 99,2 \%$$

$$\text{Rata-rata konsentrasi 1 ppm} = \frac{98,4 \% + 100,7 \% + 102,0 \%}{3} = 100,3 \%$$

$$\text{Rata-rata konsentrasi 2 ppm} = \frac{99,8 \% + 100,7 \% + 100,2 \%}{3} = 100,2 \%$$

$$\text{Rata-rata konsentrasi 3 ppm} = \frac{98,1 \% + 98,7 \% + 99,2 \%}{3} = 98,6 \%$$

$$\text{SD konsentrasi 1} = \sqrt{\frac{(x_2-x_1)^2}{N-1}}$$

$$= \sqrt{\frac{2,22}{2}}$$

$$= \sqrt{1,11}$$

$$= 1,05$$

$$\text{RSD konsentrasi 1} = \frac{\text{SD}}{X} \times 100 \%$$

$$= \frac{1,05}{100,3} \times 100\%$$

$$= 1,046 \%$$

$$\text{SD konsentrasi 2} = \sqrt{\frac{(x_2 - x_1)^2}{N-1}}$$

$$= \sqrt{\frac{0,41}{2}}$$

$$= \sqrt{0,205}$$

$$= 0,452$$

$$\text{RSD konsentrasi 2} = \frac{\text{SD}}{X} \times 100 \%$$

$$= \frac{0,452}{100,2} \times 100\%$$

$$= 0,451 \%$$

$$\text{SD konsentrasi 3} = \sqrt{\frac{(x_2 - x_1)^2}{N-1}}$$

$$= \sqrt{\frac{0,625}{2}}$$

$$= \sqrt{0,31}$$

$$= 0,556$$

$$\text{RSD konsentrasi 3} = \frac{\text{SD}}{X} \times 100 \%$$

$$= \frac{0,556}{98,6} \times 100\%$$

$$= 0,563 \%$$

**Lampiran 9. Perhitungan LOD dan LOQ**

Konsentrasi (ppm)	Rata-rata absorbansi (A)	SD	LOD (ppm)	LOQ (ppm)
1	0,245	0,0019	0,0254	0,0846

a. Perhitungan LOD :

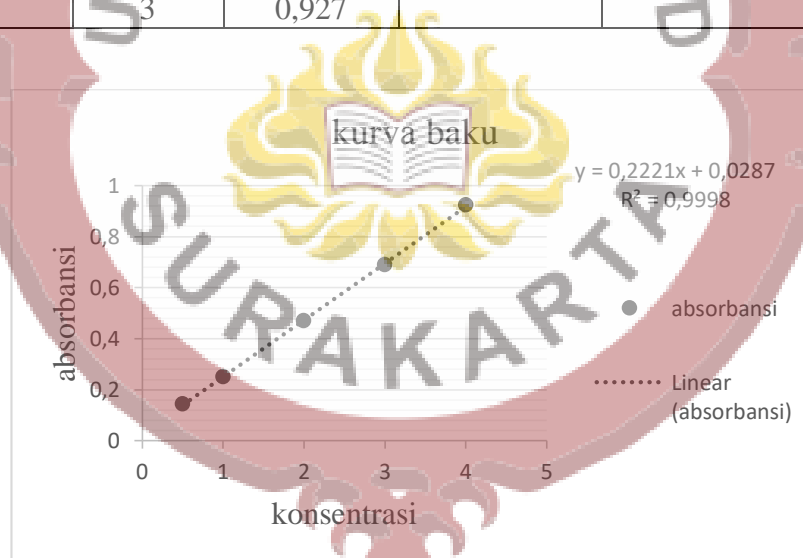
$$\begin{aligned} \text{LOD} &= \frac{3 \times SD}{b} \\ &= \frac{3 \times 0,0019}{0,2244} \\ &= 0,0254 \text{ ppm} \end{aligned}$$

b. Perhitungan LOQ

$$\begin{aligned} \text{LOQ} &= \frac{10 \times SD}{b} \\ &= \frac{10 \times 0,0019}{0,2244} \\ &= 0,0846 \text{ ppm} \end{aligned}$$

### Lampiran 10. Kurva Baku

Konsentrasi (ppm)	Replikasi	Absorbansi (A)	Rata-rata absorbansi (A)	Persamaan regresi linear
0,5	1	0,145	0,144	$y = 0,221x + 0,0287$ $R^2 = 0,9998$
	2	0,142		
	3	0,147		
1	1	0,242	0,250	
	2	0,251		
	3	0,257		
2	1	0,467	0,470	
	2	0,474		
	3	0,470		
3	1	0,685	0,689	
	2	0,693		
	3	0,689		
4	1	0,918	0,923	
	2	0,924		
	3	0,927		



### Lampiran 11. Perhitungan Kadar Formalin (Uji Kuantitatif)

Sampel	Replikasi	Absorbansi (A)	Kadar Formalin (mg/kg)	Rata-rata kadar formalin (mg/kg) ± SD
A	1	0,544	9,29	9,31 ± 0,031
	2	0,547	9,35	
	3	0,545	9,31	
B	1	0,366	6,08	6,10 ± 0,031
	2	0,369	6,14	
	3	0,367	6,10	

Persamaan regresi linier  $y = 0,2221x + 0,0287$

$$\text{Kadar formalin (ppm)} = \frac{C \times V \times Fp}{\text{berat sampel (mg)}} \times 10^6$$

a. Perhitungan kadar sampel A

$$A_1 = \frac{0,544 - 0,0287}{0,2221}$$

$$= \frac{2,320 \text{ mg/l} \times 0,01 \text{ L} \times 2}{4,990 \text{ mg}} \times 10^6$$

$$= 9,29 \text{ mg/kg}$$

$$A_2 = \frac{0,547 - 0,0287}{0,2221}$$

$$= \frac{2,333 \text{ mg/l} \times 0,01 \text{ L} \times 2}{4,990 \text{ mg}} \times 10^6$$

$$= 9,35 \text{ mg/kg}$$

$$A_3 = \frac{0,545 - 0,0287}{0,2221}$$

$$= \frac{2,324 \text{ mg/l} \times 0,01 \text{ L} \times 2}{4,990 \text{ mg}} \times 10^6$$

$$= 9,31 \text{ mg/kg}$$

b. Perhitungan kadar sampel B

$$B_1 = \frac{0,366 - 0,0287}{0,2221}$$

$$= \frac{1,518 \text{ mg/l} \times 0,01 \text{ L} \times 2}{4.990 \text{ mg}} \times 10^6$$

$$= 6,08 \text{ mg/kg}$$

$$B_2 = \frac{0,369 - 0,0287}{0,2221}$$

$$= \frac{1,532 \text{ mg/l} \times 0,01 \text{ L} \times 2}{4.990 \text{ mg}} \times 10^6$$

$$= 6,14 \text{ mg/kg}$$

$$B_3 = \frac{0,367 - 0,0287}{0,2221}$$

$$= \frac{1,523 \text{ mg/l} \times 0,01 \text{ L} \times 2}{4.990 \text{ mg}} \times 10^6$$

$$= 6,10 \text{ mg/kg}$$

$$\text{Rata-rata kadar sampel A} = \frac{9,29 + 9,35 + 9,31}{3} = 9,31$$

$$\text{Rata-rata kadar sampel B} = \frac{6,08 + 6,14 + 6,10}{3} = 6,10$$

$$\text{SD kadar sampel A} = \sqrt{\frac{(x_2 - x_1)^2}{N - 1}}$$

$$= \sqrt{\frac{0,002}{2}}$$

$$= \sqrt{0,001}$$

$$= 0,031$$

$$\text{RSD kadar sampel A} = \frac{\text{SD}}{X} \times 100 \%$$

$$= \frac{0,031}{9,31} \times 100\%$$

$$= 0,332 \%$$

$$\text{SD kadar sampel B} = \sqrt{\frac{(x_2 - x_1)^2}{N - 1}}$$

$$= \sqrt{\frac{0,002}{2}}$$

$$= \sqrt{0,001}$$

$$= 0,031$$

$$\text{RSD kadar sampel B} = \frac{\text{SD}}{X} \times 100 \%$$

$$= \frac{0,031}{6,10} \times 100\%$$

$$= 0,508 \%$$