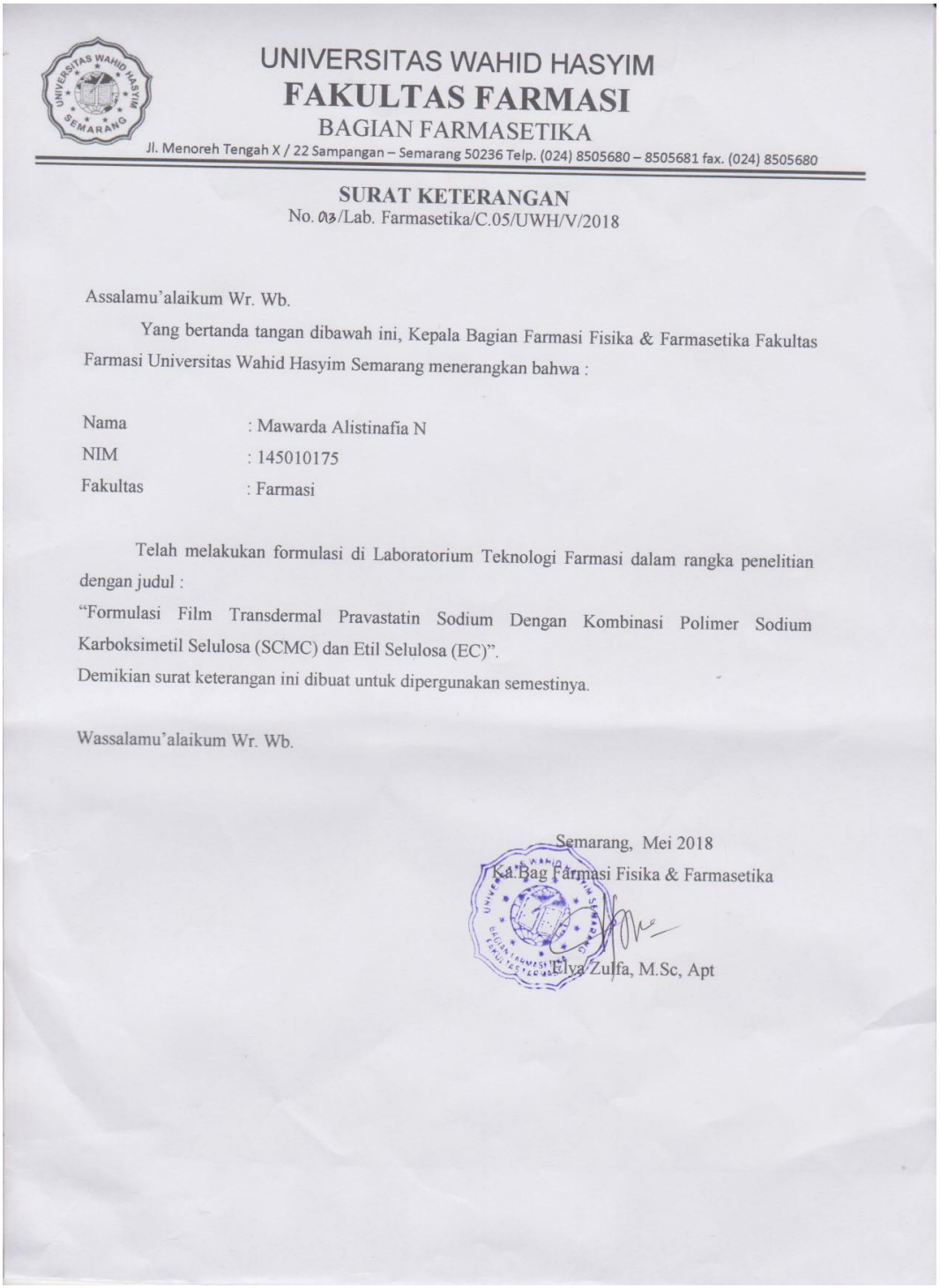
LAMPIRAN

Lampiran 1. Surat Keterangan Laboratorium Farmasi Fisika



UNIVERSITAS WAHID HASYIM
FAKULTAS FARMASI
BAGIAN FARMASETIKA
Jl. Menoreh Tengah X / 22 Sampangan – Semarang 50236 Telp. (024) 8505680 – 8505681 fax. (024) 8505680

SURAT KETERANGAN
No. 03/Lab. Farmasetika/C.05/UWH/V/2018

Assalamu'alaikum Wr. Wb.

Yang bertanda tangan dibawah ini, Kepala Bagian Farmasi Fisika & Farmasetika Fakultas Farmasi Universitas Wahid Hasyim Semarang menerangkan bahwa :

Nama : Mawarda Alistinafia N
NIM : 145010175
Fakultas : Farmasi

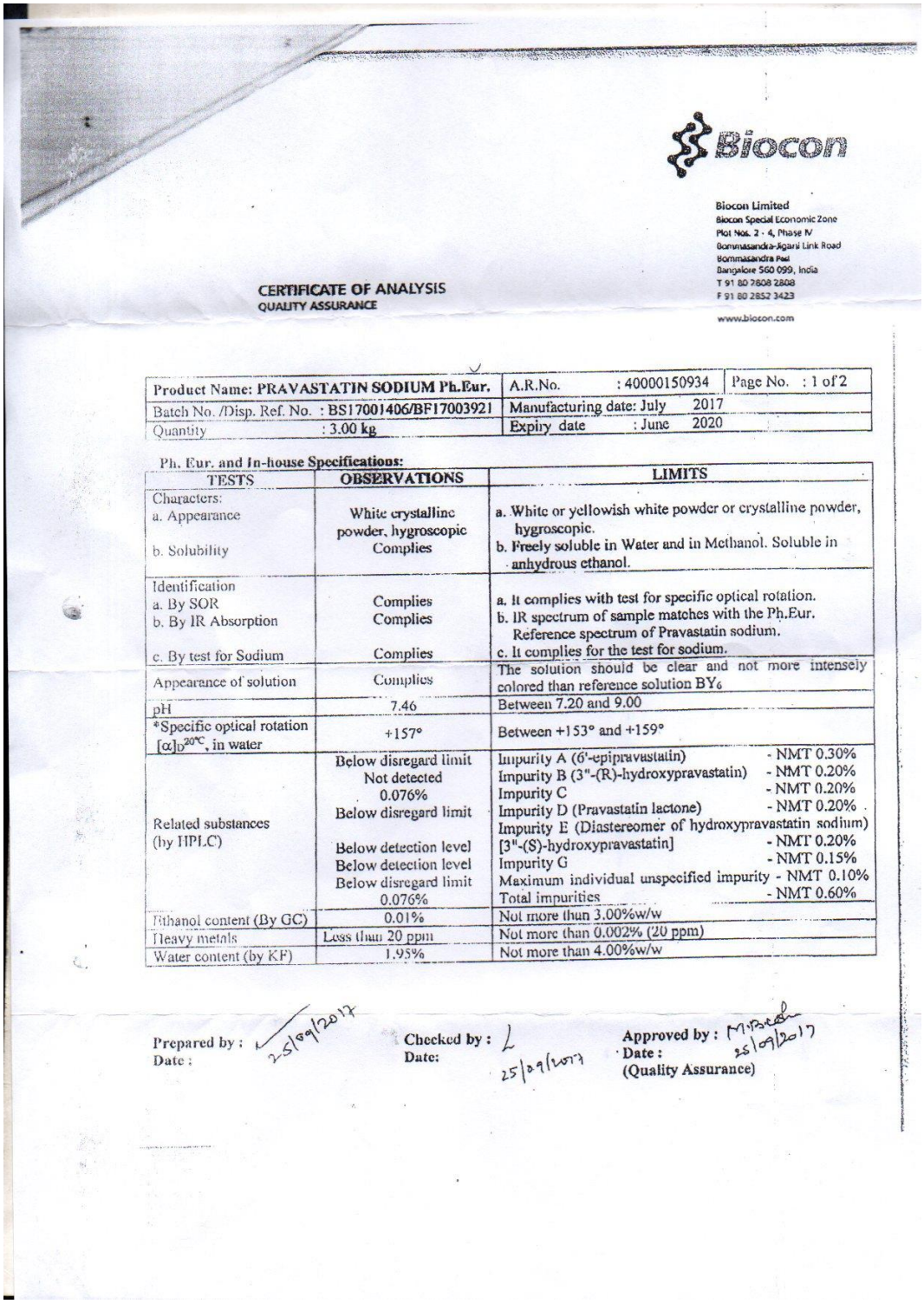
Telah melakukan formulasi di Laboratorium Teknologi Farmasi dalam rangka penelitian dengan judul :
"Formulasi Film Transdermal Pravastatin Sodium Dengan Kombinasi Polimer Sodium Karboksimetil Selulosa (SCMC) dan Etil Selulosa (EC)".
Demikian surat keterangan ini dibuat untuk dipergunakan semestinya.

Wassalamu'alaikum Wr. Wb.

Semarang, Mei 2018
Ka.Bag Farmasi Fisika & Farmasetika

Elya Zulfa, M.Sc, Apt

Lampiran 2. *Certificate of Analysis* Pravastatin Sodium



Biocon

Biocon Limited
Biocon Special Economic Zone
Plot Nos. 2 - 4, Phase IV
Bommasandra-Jigani Link Road
Bommasandra Post
Bangalore 560 099, India
T 91 80 7808 2808
F 91 80 2852 3423
www.biocon.com

CERTIFICATE OF ANALYSIS
QUALITY ASSURANCE

Product Name: PRAVASTATIN SODIUM Ph.Eur.	A.R.No. : 40000150934	Page No. : 1 of 2
Batch No. /Disp. Ref. No. : BS17001406/BF17003921	Manufacturing date: July 2017	
Quantity : 3.00 kg	Expiry date : June 2020	

Ph. Eur. and In-house Specifications:

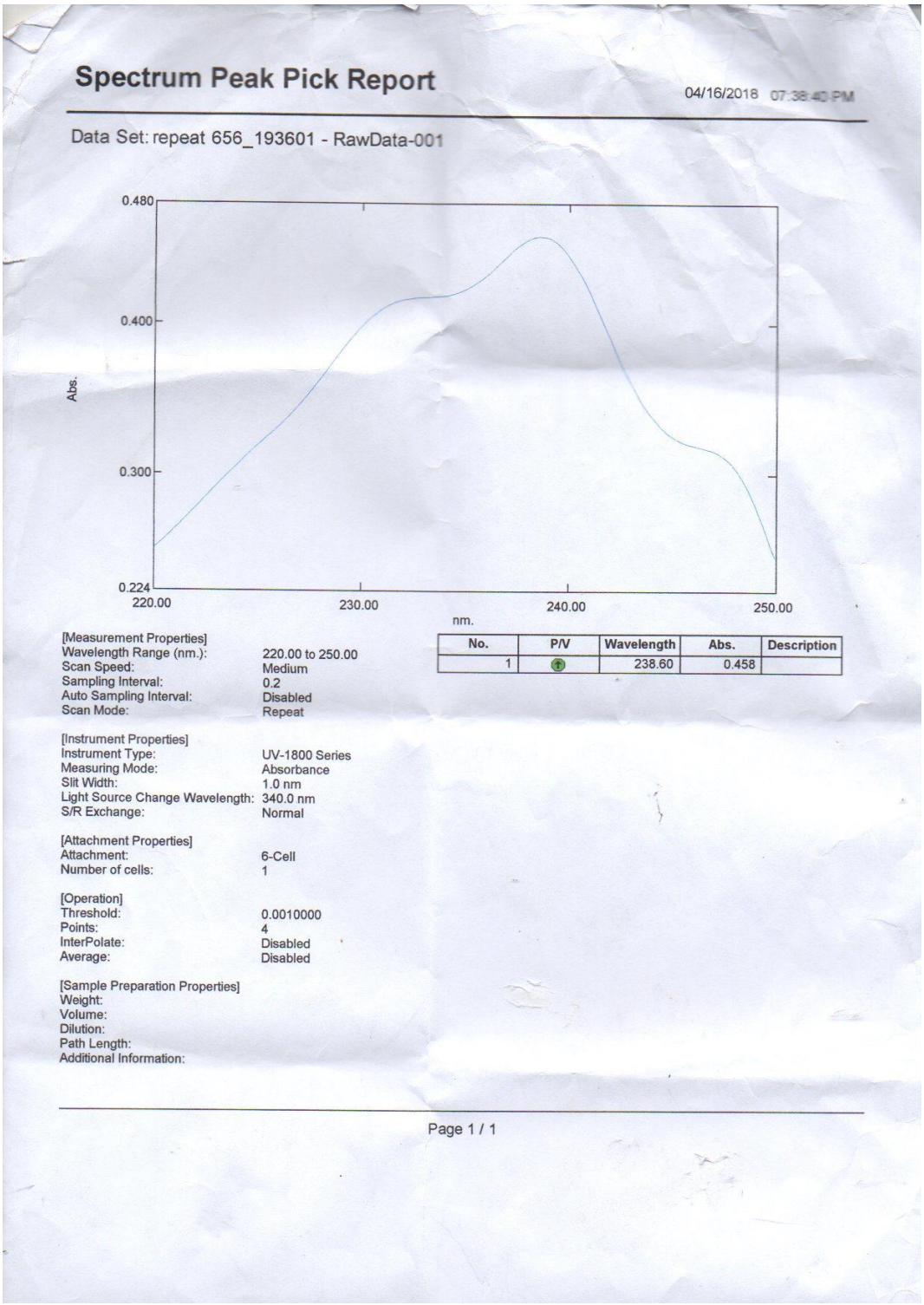
TESTS	OBSERVATIONS	LIMITS
Characters: a. Appearance b. Solubility	White crystalline powder, hygroscopic Complies	a. White or yellowish white powder or crystalline powder, hygroscopic. b. Freely soluble in Water and in Methanol. Soluble in anhydrous ethanol.
Identification a. By SOR b. By IR Absorption c. By test for Sodium	 Complies Complies Complies	 a. It complies with test for specific optical rotation. b. IR spectrum of sample matches with the Ph.Eur. Reference spectrum of Pravastatin sodium. c. It complies for the test for sodium.
Appearance of solution	Complies	The solution should be clear and not more intensely colored than reference solution BY6
pH	7.46	Between 7.20 and 9.00
*Specific optical rotation $[\alpha]_D^{20°C}$, in water	+157°	Between +153° and +159°
Related substances (by HPLC)	Below disregard limit Not detected 0.076% Below disregard limit Below detection level Below detection level Below disregard limit 0.076%	Impurity A (6'-epipravastatin) - NMT 0.30% Impurity B (3"-(R)-hydroxypravastatin) - NMT 0.20% Impurity C - NMT 0.20% Impurity D (Pravastatin lactone) - NMT 0.20% Impurity E (Diastereomer of hydroxypravastatin sodium) [3"-(S)-hydroxypravastatin] - NMT 0.20% Impurity G - NMT 0.15% Maximum individual unspecified impurity - NMT 0.10% Total impurities - NMT 0.60%
Ethanol content (By GC)	0.01%	Not more than 3.00%w/w
Heavy metals	Less than 20 ppm	Not more than 0.002% (20 ppm)
Water content (by KF)	1.95%	Not more than 4.00%w/w

Prepared by : **Date :** 25/09/2017

Checked by : **Date:** 25/09/2017

Approved by : **Date :** 25/09/2017
(Quality Assurance)

Lampiran 3. Panjang gelombang Maksimal



Spectrum Peak Pick Report

04/16/2018 07:38:40 PM

Data Set: repeat 656_193601 - RawData-001

No.	P/V	Wavelength	Abs.	Description
1	↑	238.60	0.458	

[Measurement Properties]
Wavelength Range (nm.): 220.00 to 250.00
Scan Speed: Medium
Sampling Interval: 0.2
Auto Sampling Interval: Disabled
Scan Mode: Repeat

[Instrument Properties]
Instrument Type: UV-1800 Series
Measuring Mode: Absorbance
Slit Width: 1.0 nm
Light Source Change Wavelength: 340.0 nm
S/R Exchange: Normal

[Attachment Properties]
Attachment: 6-Cell
Number of cells: 1

[Operation]
Threshold: 0.0010000
Points: 4
InterPolate: Disabled
Average: Disabled

[Sample Preparation Properties]
Weight:
Volume:
Dilution:
Path Length:
Additional Information:

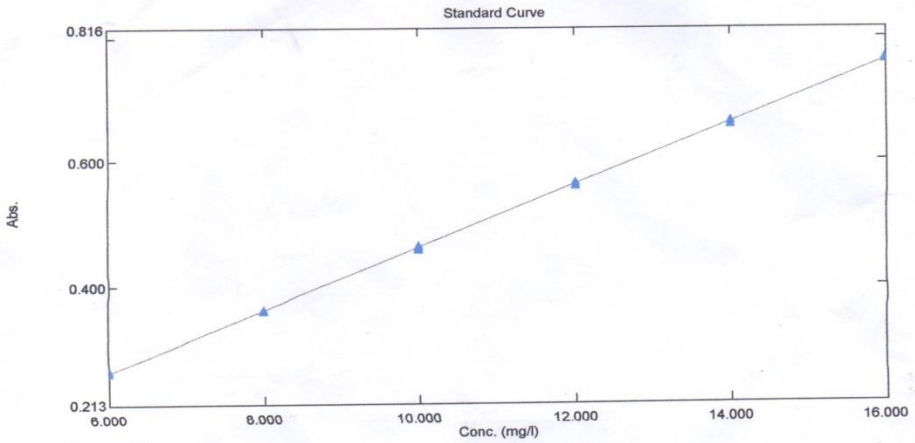
Page 1 / 1

Lampiran 4. Data Absorbansi Kurva Baku

Standard Table Report

04/16/2018 07:21:23 PM

File Name: C:\Users\HP\Documents\File_180416_165911.pho



y = 0.04988 x - 0.03522
Correlation Coefficient r2 = 0.99984

Standard Table

	Sample ID	Type	Ex	Conc	WL238.6	Wgt.Factor	Comments
1	6 ppm	Standard		6.000	0.264	1.000	
2	8 ppm	Standard		8.000	0.363	1.000	
3	10 ppm	Standard		10.000	0.466	1.000	
4	12 ppm	Standard		12.000	0.566	1.000	
5	14 ppm	Standard		14.000	0.664	1.000	
6	16 ppm	Standard		16.000	0.766	1.000	
7	6 ppm b	Standard		6.000	0.267	1.000	
8	8 ppm b	Standard		8.000	0.365	1.000	
9	10 ppm b	Standard		10.000	0.460	1.000	
10	12 ppm b	Standard		12.000	0.563	1.000	
11	14 ppm b	Standard		14.000	0.658	1.000	
12	16 ppm b	Standard		16.000	0.763	1.000	
13	6 ppm c	Standard		6.000	0.264	1.000	
14	8 ppm c	Standard		8.000	0.364	1.000	
15	10 ppm c	Standard		10.000	0.462	1.000	
16	12 ppm c	Standard		12.000	0.560	1.000	
17	14 ppm c	Standard		14.000	0.664	1.000	
18	16 ppm c	Standard		16.000	0.765	1.000	

Lampiran 5. Data Uji Keragaman Bobot

Replikasi	F1 7:3 (mg)	F2 8:2 (mg)	F3 9:1 (mg)
1	310.6	319.2	322.5
2	310.4	318.1	296.7
3	311	283	294
4	298.5	290	287.1
5	298.4	285	313.6
6	280.4	292.5	323.5
7	285	319.7	313.3
8	284.9	320.7	291.4
9	311.2	295	294.3
10	311.6	302.5	292.9
Rata-rata	300.2	302.57	302.93
SD	12.66272	15.44985	13.76251
CV	0.042181	0.051062	0.045431

Lampiran 6. Data Uji Ketebalan

Replikasi	F1 7:3 (cm)	F2 8:2 (cm)	F3 9:1 (cm)
1	0.024	0.024	0.026
2	0.022	0.022	0.022
3	0.022	0.024	0.022
Rata-rata	0.0227	0.0233	0.0233
SD	0.0011547	0.0011547	0.0011547

Lampiran 7. Data Uji Daya Tahan Lipat

Formula	Folding endurance
F1 7:3 (mg)	>800
	>800
	>800
F2 8:2 (mg)	>800
	>800
	>800
F3 9:1 (mg)	>800
	>800
	>800

Lampiran 8. Data Uji Penyerapan Lembab

Formula	Bobot awal (mg)	Bobot akhir (mg)	% moisture uptake	% rata-rata	SD
F1 7:3	280.4	304.7	8.67	8.02	0.59
	285	307.5	7.89		
	284.9	306.3	7.51		
F2 8:2	318.1	337.2	6.00	5.64	0.31
	319.7	337.3	5.50		
	320.7	338.1	5.42		
F3 9:1	348	365.2	4.94	5.46	0.46
	350	369.6	5.60		
	299.9	317.4	5.83		

$$\% \text{ penyerapan lembab} = \frac{\text{bobot akhir} - \text{bobot awal}}{\text{Bobot awal}} \times 100$$

Lampiran 9. Data Uji Kandungan Zat Aktif

F1 7:3							
Absorbansi	Konsentrasi (ppm)	FP	Kadar (mg)	Recovery (%)	Rata-rata (%)	SD	CV
0.413	8.97	40	358.87	89.72	87.72	1.738	0.02
0.397	8.65	40	346.11	86.53			
0.399	8.69	40	347.71	86.93			

F2 8:2							
Absorbansi	Konsentrasi (ppm)	FP	Kadar (mg)	Recovery (%)	Rata-rata (%)	SD	CV
0.418	9.07	40	362.85	90.71	90.05	0.698	0.01
0.415	9.01	40	360.46	90.12			
0.411	8.93	40	357.27	89.32			

F3 9:1							
Absorbansi	Konsentrasi (ppm)	FP	Kadar (mg)	Recovery (%)	Rata-rata (%)	SD	CV
0.423	9.17	40	366.84	91.71	90.78	0.829	0.01
0.417	9.05	40	362.06	90.51			
0.415	9.01	40	360.46	90.12			

Perhitungan Kandungan zat aktif pravastatin sodium

Persamaan kurva baku - > Y = 0.05018x - 0.0372

Formula III replikasi 3 - > 0.415 = 0.05018x - 0.0372

$$X = \frac{0.415 + 0.0372}{0.05018}$$

X = 9.01

\Kadar pravastatin sodium = kadar (ppm) X FP

= 9.011 ppm X 40

= 360.46 mg

$$\text{Recovery} = \frac{\text{kadar pravastatin sodium (mg)}}{\text{Kadar pravastatin sodium sesungguhnya (mg)}} \times 100\%$$

$$= \frac{360.46 \text{ mg}}{400 \text{ mg}} \times 100\% \rightarrow 90.12\%$$

Lampiran 10. Data Uji Disolusi I*n Vitro*

FI (8:2)

Replikasi I

Waktu (jam)	Absorbansi	Faktor Pengenceran	Kadar (µg/ml)	∑ Terlarut	Faktor Koreksi	∑ Terlarut setelah koreksi	%Terlarut
1	0.204	-	4.81	4.326	0	4.326	11.88
2	0.331	-	7.34	6.604	0.027	6.631	18.21
3	0.342	-	7.56	6.801	0.067	6.869	18.21
4	0.426	-	9.23	8.308	0.109	8.417	23.11
5	0.48	-	10.31	9.276	0.161	9.437	25.91
6	0.512	-	10.94	9.850	0.218	10.068	27.64

Replikasi II

Waktu (jam)	Absorbansi	Faktor Pengenceran	Kadar (µg/ml)	∑ Terlarut	Faktor Koreksi	∑ Terlarut setelah koreksi	%Terlarut
1	0.272	-	6.16	5.546	0	5.546	14.90
2	0.302	-	6.76	6.084	0.034	6.118	16.44
3	0.326	-	7.24	6.514	0.072	6.586	17.70
4	0.363	-	7.98	7.178	0.112	7.290	19.59
5	0.411	-	8.93	8.039	0.156	8.195	22.02
6	0.453	-	9.77	8.792	0.206	8.998	24.18

Replikasi III

Waktu (jam)	Absorbansi	Faktor Pengenceran	Kadar (µg/ml)	∑ Terlarut	Faktor Koreksi	∑ Terlarut setelah koreksi	%Terlarut
1	0.277	-	6.26	5.635	0	5.635	15.50
2	0.296	-	6.64	5.976	0.035	6.011	16.54
3	0.308	-	6.88	6.191	0.072	6.263	17.23
4	0.387	-	8.45	7.608	0.110	7.718	21.23
5	0.408	-	8.87	7.985	0.157	8.142	22.40
6	0.452	-	9.75	8.774	0.206	8.980	24.70

FII (7:3)

Replikasi I

Waktu (jam)	Absorbansi	Faktor Pengenceran	Kadar (µg/ml)	∑ Terlarut	Faktor Koreksi	∑ Terlarut setelah koreksi	%Terlarut
1	0.112	-	2.97	2.676	0	2.676	7.03
2	0.118	-	3.09	2.784	0.017	2.800	7.36
3	0.120	-	3.13	2.819	0.034	2.853	7.50
4	0.308	-	6.88	6.191	0.051	6.242	16.40
5	0.313	-	6.98	6.281	0.089	6.370	16.74
6	0.345	-	7.62	6.855	0.128	6.983	18.35

Replikasi II

Waktu (jam)	Absorbansi	Faktor Pengenceran	Kadar (µg/ml)	∑ Terlarut	Faktor Koreksi	∑ Terlarut setelah koreksi	%Terlarut
1	0.200	-	4.73	4.254	0	4.254	11.14
2	0.315	-	7.02	6.317	0.026	6.343	16.61
3	0.322	-	7.16	6.442	0.065	6.508	17.04
4	0.351	-	7.74	6.963	0.105	7.068	18.51
5	0.360	-	7.92	7.124	0.148	7.272	19.05
6	0.380	-	8.31	7.483	0.192	7.675	20.10

Replikasi III

Waktu (jam)	Absorbansi	Faktor Pengenceran	Kadar (µg/ml)	∑ Terlarut	Faktor Koreksi	∑ Terlarut setelah koreksi	%Terlarut
1	0.185	-	4.43	3.985	0	3.985	11.44
2	0.193	-	4.59	4.129	0.025	4.153	11.93
3	0.228	-	5.28	4.756	0.050	4.807	13.80
4	0.259	-	5.90	5.312	0.079	5.392	15.48
5	0.266	-	6.04	5.438	0.112	5.550	15.94
6	0.283	-	6.38	5.743	0.146	5.889	16.91

FIII (6:4)

Replikasi I

Waktu (jam)	Absorbansi	Faktor Pengenceran	Kadar (µg/ml)	∑ Terlarut	Faktor Koreksi	∑ Terlarut setelah koreksi	%Terlarut
1	0.204	-	4.81	4.326	0	4.326	11.52
2	0.219	-	5.11	4.595	0.027	4.622	12.31
3	0.245	-	5.62	5.061	0.055	5.116	13.62
4	0.271	-	6.14	5.528	0.086	5.614	14.95
5	0.289	-	6.50	5.851	0.120	5.971	15.90
6	0.297	-	6.66	5.994	0.157	6.151	16.38

Replikasi II

Waktu (jam)	Absorbansi	Faktor Pengenceran	Kadar (µg/ml)	∑ Terlarut	Faktor Koreksi	∑ Terlarut setelah koreksi	%Terlarut
1	0.209	-	4.91	4.416	0	4.416	11.39
2	0.217	-	5.07	4.559	0.027	4.586	11.82
3	0.251	-	5.74	5.169	0.055	5.224	13.47
4	0.292	-	6.56	5.904	0.087	5.992	15.45
5	0.310	-	6.92	6.227	0.124	6.351	16.38
6	0.343	-	7.58	6.819	0.162	6.981	18.00

Replikasi III

Waktu (jam)	Absorbansi	Faktor Pengenceran	Kadar (µg/ml)	∑ Terlarut	Faktor Koreksi	∑ Terlarut setelah koreksi	%Terlarut
1	0.194	-	4.59	4.131	0	4.131	10.68
2	0.228	-	5.28	4.752	0.026	4.778	12.36
3	0.245	-	5.62	5.058	0.055	5.113	13.22
4	0.265	-	6.02	5.418	0.086	5.504	14.24
5	0.297	-	6.66	5.994	0.120	6.114	15.81
6	0.312	-	6.96	6.264	0.157	6.421	16.61

Kadar (µg/ml) diperoleh dengan memasukkan absorbansipada persamaan kurva baku (Y= 0.05018 x + 0.0372). Absorbansi pada jam ke- 1 yaitu 0.194 diperoleh hasil x= 4.59 µg/ml dikalikan faktor pengenceran x=4.59 µg/ml

∑ Terlarut diperoleh dari kadar dikalikan volume medium yang digunakan. Kadar pada jam ke-1 yaitu 4.59 µg/ml dikaliakan 900 ml, hasilnya 4.131 mg

Faktor Koreksi diperoleh dari (5/900 x kadar sebelumnya) + factor koreksi sebelumnya. Faktor koreksi pada jam ke- 2 diperoleh dari =(5/900 x 0) + 0 = 0

∑ Terlarut setelah koreksi diperoleh dari =(faktor koreksi + ∑ Terlarut)

%Terlarut diperoleh dari =(∑ Terlarut setelah koreksi/(bobot film/bobot rata-rata film x %rata-rata kandungan zat aktif x kadar awal dalam film)) x 100%

Lampiran 11. Hasil *SPSS* Keragaman Bobot

Test of Homogeneity of Variances

Keseragaman Bobot

Levene Statistic	df1	df2	Sig.
.610	2	27	.551

Tests of Normality

		Kolmogorov-Smirnov[a]			Shapiro-Wilk		
	Formula	Statistic	df	Sig.	Statistic	df	Sig.
Keseragaman Bobot	F1	.290	10	.017	.806	10	.017
	F2	.243	10	.098	.851	10	.059
	F3	.275	10	.031	.848	10	.055

a. Lilliefors Significance Correction

Kruskal-Wallis

Ranks

	Fo...	N	Mean Rank
Keseragaman Bobot	F1	10	13.95
	F2	10	15.85
	F3	10	16.70
	Total	30	

Test Statistics[a,b]

	Keseragaman Bobot
Chi-Square	.512
df	2
Asymp. Sig.	.774

a. Kruskal Wallis Test

b. Grouping Variable: Formula

Lampiran 12. Hasil *SPSS* Uji Ketebalan

Test of Homogeneity of Variances

uji ketebalan

Levene Statistic	df1	df2	Sig.
7.813	2	5	.029

Tests of Normality

	formula	Kolmogorov-Smirnov[a]			Shapiro-Wilk		
		Statistic	df	Sig.	Statistic	df	Sig.
uji ketebalan	F1	.385	3	.	.750	3	.000
	F2	.385	3	.	.750	3	.000
	F3	.385	3	.	.750	3	.000

a. Lilliefors Significance Correction

Kruskal-Wallis

Ranks

	for...	N	Mean Rank
uji ketebalan	F1	3	4.33
	F2	3	5.67
	F3	3	5.00
	Total	9	

Test Statistics[a,b]

	uji ketebalan
Chi-Square	.444
df	2
Asymp. Sig.	.801

a. Kruskal Wallis Test

b. Grouping Variable: formula

Lampiran 13. Hasil *SPSS* Uji Penyerapan Lembab

Test of Homogeneity of Variances

Penyerapan Lembab

Levene Statistic	df1	df2	Sig.
.157	2	6	.858

Tests of Normality

	formula	Kolmogorov-Smirnov[a]			Shapiro-Wilk		
		Statistic	df	Sig.	Statistic	df	Sig.
Penyerapan Lembab	f1	.256	3	.	.962	3	.625
	f2	.203	3	.	.994	3	.849
	f3	.288	3	.	.928	3	.480

a. Lilliefors Significance Correction

ANOVA

Penyerapan Lembab

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	12.940	2	6.470	24.564	.001
Within Groups	1.580	6	.263		
Total	14.521	8			

Multiple Comparisons

Penyerapan Lembab
Tukey HSD

(I) formula	(J) formula	Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval	
					Lower Bound	Upper Bound
f1	f2	2.52000*	.41905	.002	1.2343	3.8057
	f3	2.56667*	.41905	.002	1.2809	3.8524
f2	f1	-2.52000*	.41905	.002	-3.8057	-1.2343
	f3	.04667	.41905	.993	-1.2391	1.3324
f3	f1	-2.56667*	.41905	.002	-3.8524	-1.2809
	f2	-.04667	.41905	.993	-1.3324	1.2391

*. The mean difference is significant at the 0.05 level.

Lampiran 14. Hasil *SPSS* Uji Kandungan Zat Aktif

Tests of Normality

		Kolmogorov-Smirnov[a]			Shapiro-Wilk		
	Formula	Statistic	df	Sig.	Statistic	df	Sig.
Kandungan zat aktif	f1	.344	3	.	.842	3	.219
	f2	.204	3	.	.993	3	.843
	f3	.292	3	.	.923	3	.463

a. Lilliefors Significance Correction

Test of Homogeneity of Variances

Kandungan zat aktif

Levene Statistic	df1	df2	Sig.
3.008	2	5	.139

ANOVA

Kandungan zat aktif

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	15.717	2	7.859	5.020	.064
Within Groups	7.827	5	1.565		
Total	23.544	7			

Lampiran 15. Hasil *SPSS* Uji Disolusi *In Vitro*

Tests of Normality

		Kolmogorov-Smirnov[a]			Shapiro-Wilk		
	Formula	Statistic	df	Sig.	Statistic	df	Sig.
% Terlarut	F1	.248	6	.200*	.911	6	.444
	F2	.142	6	.200*	.963	6	.844
	F3	.177	6	.200*	.970	6	.892

a. Lilliefors Significance Correction

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

Test of Homogeneity of Variances

% Terlarut

Levene Statistic	df1	df2	Sig.
2.138	2	15	.152

ANOVA

% Terlarut

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	90.653	2	45.326	4.470	.030
Within Groups	152.089	15	10.139		
Total	242.742	17			

Multiple Comparisons

% Terlarut
Tukey HSD

(I) Formula	(J) Formula	Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval	
					Lower Bound	Upper Bound
F1	F2	4.80333*	1.83841	.049	.0281	9.5786
	F3	4.71667	1.83841	.053	-.0586	9.4919
F2	F1	-4.80333*	1.83841	.049	-9.5786	-.0281
	F3	-.08667	1.83841	.999	-4.8619	4.6886
F3	F1	-4.71667	1.83841	.053	-9.4919	.0586
	F2	.08667	1.83841	.999	-4.6886	4.8619

*. The mean difference is significant at the 0.05 level.