

## LAMPIRAN

### Lampiran 1. Certificate of Analysis ATORVASTATIN KALSIMUM

Quality, Reliability, Sustainability

SINOCEM DSM  
DSM Sinocelem Pharmaceutical

#### Certificate of Analysis


**ATORVASTATIN CALCIUM TRIHYDRATE** ✓  
**GRADE: CRYSTALLINE**

Batch / Lot No: M110393 Mfg. Lic. No: 1879-OSP  
 Batch / Lot size: 365 Kg  
 Mfg Date: September 2017 Expiry/Retest Date: August 2022 Release Date: 09/10/2017

Character: White or almost white powder, very slightly soluble in water, slightly soluble in ethanol (95%), practically insoluble in methylene chloride

Tests	Specifications	Units	Results
Identifiers	A. Atorvastatin Calcium IR B. Calcium C. XRD - Characteristic 2θ values (2-15, 8-47, 10-266, 10-26, 11-662, 12-136, 17-575, 18-425, 21-626, 21-950, 22-748, 23-316, 23-734)		Complies Complies Complies
Residue (anhydrous basis)	97.0 to 100.0	%	98.8
Sodium hydroxide substance	Not more than 0.4	%	0.10
Heavy metals	Not more than 20	ppm	Less than 20
Specified impurities			
Dechloro (impurity A)	Not more than 0.3	%	0.05
3S SR isomer (impurity B)	Not more than 0.3	%	0.05
Diol (impurity C)	Not more than 0.15	%	Not detected
Dimer (impurity D)	Not more than 0.15	%	Not detected
Any unspecified impurity	Not more than 0.10	%	Less than 0.05
Other substances			
Amide (impurity F)	Not more than 0.15	%	0.06
3-O-methyl (impurity G)	Not more than 0.15	%	0.06
Lactone (impurity H)	Not more than 0.15	%	Less than 0.05
Total impurities (impurity E Not included)	Not more than 1.5	%	0.22
Impurity E (not atorvastatin)	Not more than 0.2	%	0.03
Water	5.5 to 6.5	%	4.5
Residual solvent			
- Methyl tert-Butyl ether	Not more than 5000	ppm	495
- Methanol	Not more than 3000	ppm	Not detected
Particle Size Distribution (Dry Method)			
DP5	< 20 μm	μm	5
D50	< 5 μm	μm	1
D90	< 3 μm	μm	1

Pharmaceutical quality: Complies with Ph. Eur. monograph 2181  
 Manufactured according to ICH Q7 GMP for APIs  
 Compliance to CEP: R1-CEP0210.364.161-00  
 \* Analysis performed as per USP Method  
 Storage: Store less than 30°C

Approved by  
  
 Quality Assurance

Date of issue: 13/10/2017

The information on this certificate is provided for information only. It does not constitute a guarantee of quality. The certificate is valid only if it is used in conjunction with the product. The certificate is not valid if it is used for any other purpose. The certificate is not valid if it is used for any other purpose. The certificate is not valid if it is used for any other purpose.

## Lampiran 2. Sprektrum IR Atorvastatin kalsium

PerkinElmer Spectrum Version 10.03.06  
Monday, July 23, 2018 2:25 AM

### Report

Filename Annisa S Mila Atorvastatin kalsium\_1  
Analyst Administrator  
Description Sample Atorvasatin kalsium By Administrator Date Monday, July 23 2018

### Sample Details

Creation Date 7/23/2018 2:07:09 AM  
X-Axis Units cm-1  
X-Axis start value 4000  
X-Axis end value 400  
Data interval -1  
Number of points 3601  
Y-Axis Units %T

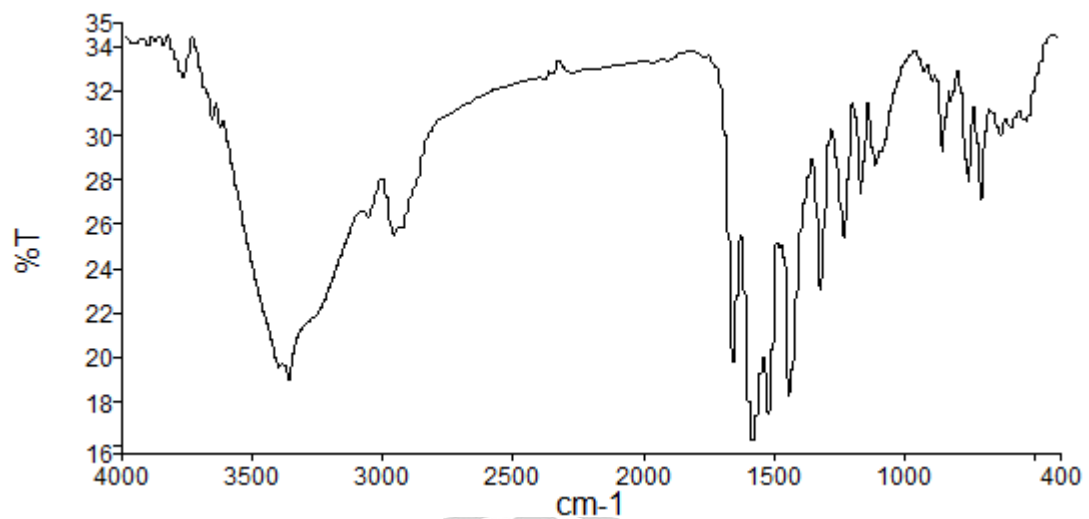
### Instrument

Instrument Model Frontier FT-IR  
Instrument Serial Number 96681  
Software Revision CPU32 Main 00.09.9951 07-September-2011 11:49:41  
Number of Scans 3  
Resolution 4

### History

Who	What	When	Parameters	Comment
Administrator	Created as New Dataset	7/23/2018 2:07:09 AM		Sample Atorvasatin kalsium By Administrator Date Monday, July 23 2018
Administrator	Atmospheric Correction	7/23/2018 2:07:09 AM		
Administrator	Smooth	7/23/2018 2:07:17 AM	"Annisa S Mila Atorvastatin kalsium", 50.00, 1, "Result.sp"	
Administrator	DataTuneUp	7/23/2018 2:07:22 AM	"Annisa S Mila Atorvastatin kalsium", "AutoSmooth", "AutoFlat2", "4000", "400"	

### Spectrum Graph

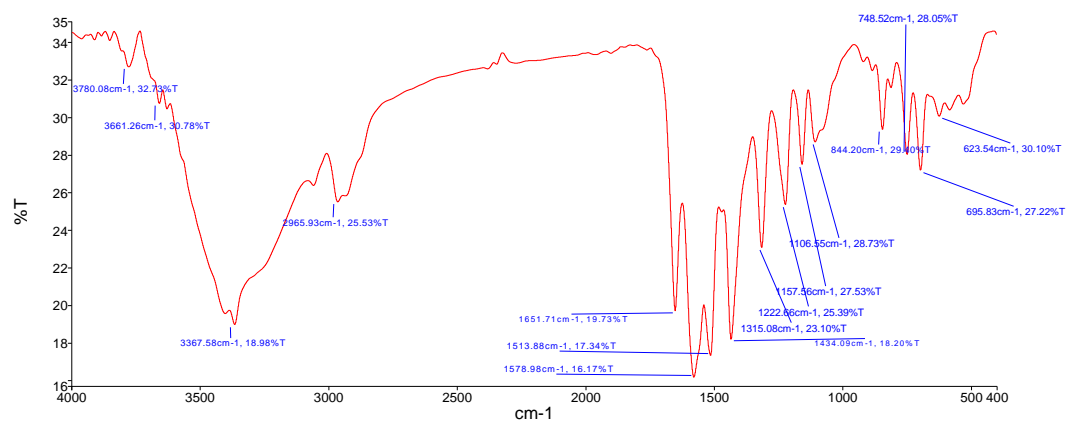


Name	Description
___ Annisa S Mila Atorvastatin_1	Sample Atorvasatin kalsium By Administrator Date Monday, July 23 2018

### Peak Table Results

SpectrumName
Annisa S Mila Atorvastatin kalsium_1

PeakName	X	Y
16	623.54	30.1
15	695.83	27.22
14	748.52	28.05
13	844.2	29.4
12	1106.55	28.73
11	1157.56	27.53
10	1222.66	25.39
9	1315.08	23.1
8	1434.09	18.2
7	1513.88	17.34
6	1578.98	16.17
5	1651.71	19.73
4	2965.93	25.53
3	3367.58	18.98
2	3661.26	30.78
1	3780.08	32.73



### Lampiran 3. Spektrum IR dispersi padat permukaan atorvastatin kalaium dengan Avicel PH 102 1:9

PerkinElmer Spectrum Version 10.03.06  
Sunday, July 22, 2018 11:51 PM

#### Report

Filename Desi Melani Avicel 102 DPP\_1  
Analyst Administrator  
Description Sample Avicel 102 DPP By Administrator Date Sunday, July 22 2018

#### Sample Details

Creation Date 7/22/2018 11:20:54 PM  
X-Axis Units cm-1  
X-Axis start value 4000  
X-Axis end value 400  
Data interval -1  
Number of points 3601  
Y-Axis Units %T

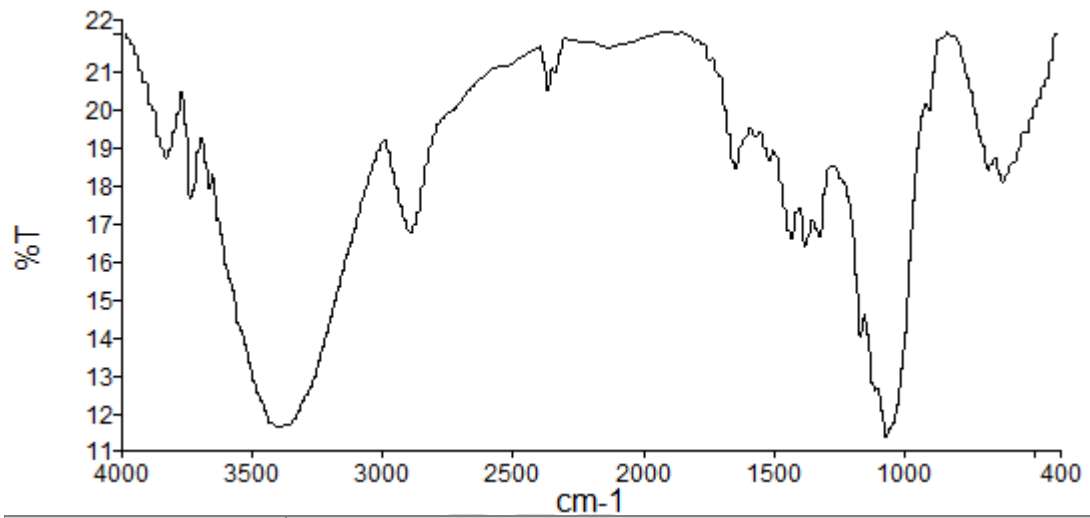
#### Instrument

Instrument Model Frontier FT-IR  
Instrument Serial Number 96681  
Software Revision CPU32 Main 00.09.9951 07-September-2011 11:49:41  
Number of Scans 3  
Resolution 4

#### History

Who	What	When	Parameters	Comment
Administrator	Created as New Dataset	7/22/2018 11:20:54 PM		Sample Avicel 102 DPP By Administrator Date Sunday, July 22 2018
Administrator	Atmospheric Correction	7/22/2018 11:20:54 PM		
Administrator	Smooth	7/22/2018 11:21:08 PM	"Desi Melani Avicel 102 DPP", 50.00, 1, "Result.sp"	
Administrator	DataTuneUp	7/22/2018 11:21:12 PM	"Desi Melani Avicel 102 DPP_1", "AutoSmooth", "AutoFlat2", "4000", "400"	

### Spectrum Graph

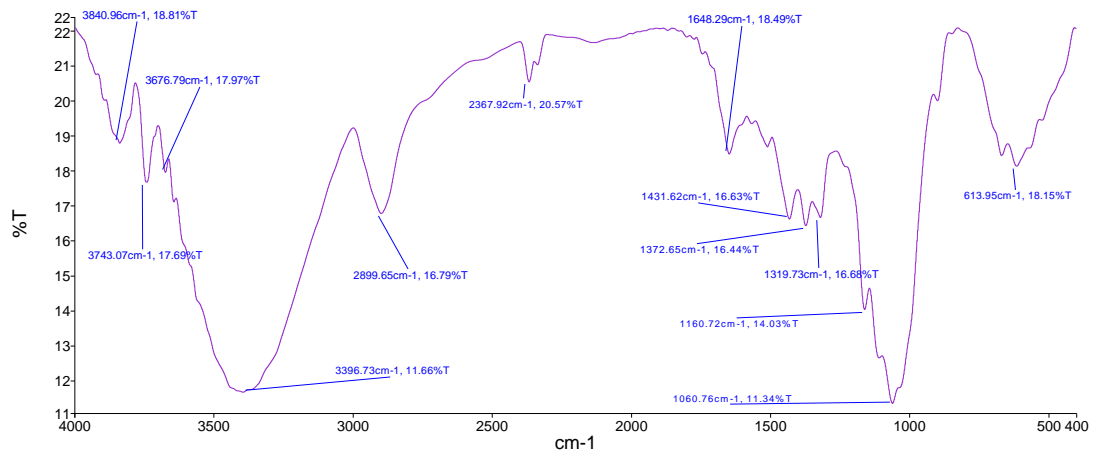


Name	Description
Desi Melani Avicel 102 DPP_1	Sample Avicel 102 DPP By Administrator Date Sunday, July 22 2018

### Peak Table Results

SpectrumName
Desi Melani Avicel 102 DPP_1

PeakName	X	Y
13	613.95	18.15
12	1060.76	11.34
11	1160.72	14.03
10	1319.73	16.68
9	1372.65	16.44
8	1431.62	16.63
7	1648.29	18.49
6	2367.92	20.57
5	2899.65	16.79
4	3396.73	11.66
3	3676.79	17.97
2	3743.07	17.69
1	3840.96	18.81



## Lampiran 4. Sprektrum IR campuran fisik atorvastatin kalaium dengan Avicel PH 102 1:9

PerkinElmer Spectrum Version 10.03.06  
Sunday, July 22, 2018 11:51 PM

### Report

Filename Desi Melani Avicel 102 CF\_1  
Analyst Administrator  
Description Sample Avicel 102 CF By Administrator Date Sunday, July 22 2018

### Sample Details

Creation Date 7/22/2018 11:41:00 PM  
X-Axis Units cm-1  
X-Axis start value 4000  
X-Axis end value 400  
Data interval -1  
Number of points 3601  
Y-Axis Units %T

### Instrument

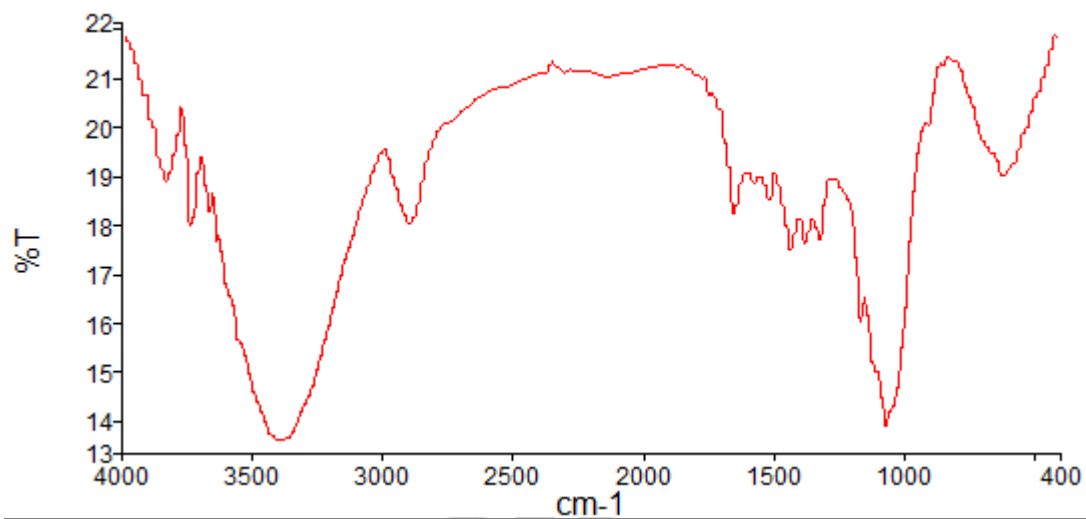
Instrument Model Frontier FT-IR  
Instrument Serial Number 96681  
Software Revision CPU32 Main 00.09.9951 07-September-2011 11:49:41  
Number of Scans 3  
Resolution 4

### History

Who	What	When	Parameters	Comment
Administrator	Created as New Dataset	7/22/2018 11:41:00 PM		Sample Avicel 102 CF By Administrator Date Sunday, July 22 2018
Administrator	Atmospheric Correction	7/22/2018 11:41:00 PM		
Administrator	Smooth	7/22/2018 11:45:14 PM	"Desi Melani Avicel 102 CF", 50.00, 1, "Result.sp"	
Administrator	DataTuneUp	7/22/2018 11:45:20 PM	"Desi Melani Avicel 102 CF", "AutoSmooth", "AutoFlat2", "4000", "400"	



### Spectrum Graph

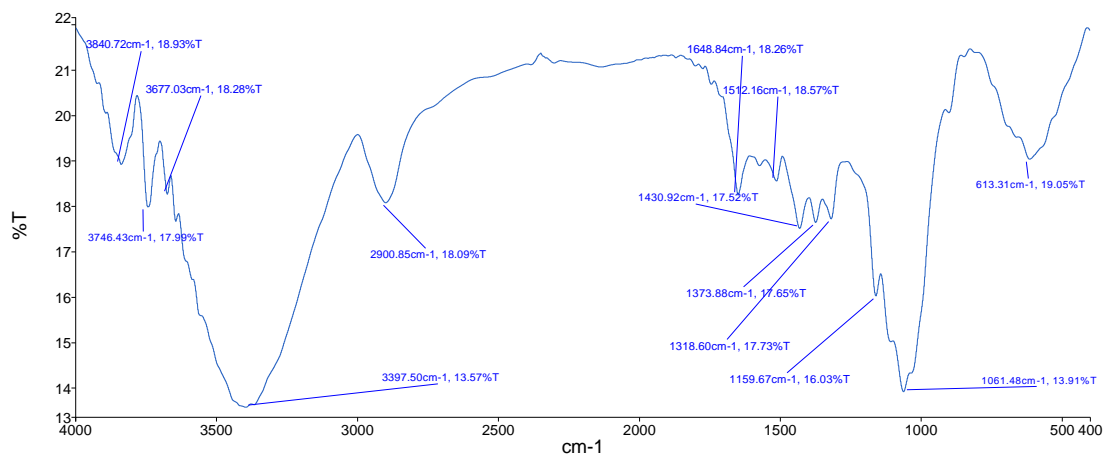


Name	Description
Desi Melani Avicel 102 CF_1	Sample Avicel 102 CF By Administrator Date Sunday, July 22 2018

### Peak Table Results

SpectrumName
Desi Melani Avicel 102 CF_1

PeakName	X	Y
13	613.31	19.05
12	1061.48	13.91
11	1159.67	16.03
10	1318.6	17.73
9	1373.88	17.65
8	1430.92	17.52
7	1512.16	18.57
6	1648.84	18.26
5	2900.85	18.09
4	3397.5	13.57
3	3677.03	18.28
2	3746.43	17.99
1	3840.72	18.93



## Lampiran 5. Sprektrum IR Avicel PH 102

PerkinElmer Spectrum Version 10.03.06  
Tuesday, August 07, 2018 11:15 PM

### Report

Filename Desi Melani Avicel PH 102\_1  
Analyst Administrator  
Description Sample Avicel PH 102 By Administrator Date Tuesday, August 07 2018

### Sample Details

Creation Date 8/7/2018 11:12:53 PM  
X-Axis Units cm-1  
X-Axis start value 4000  
X-Axis end value 400  
Data interval -1  
Number of points 3601  
Y-Axis Units %T

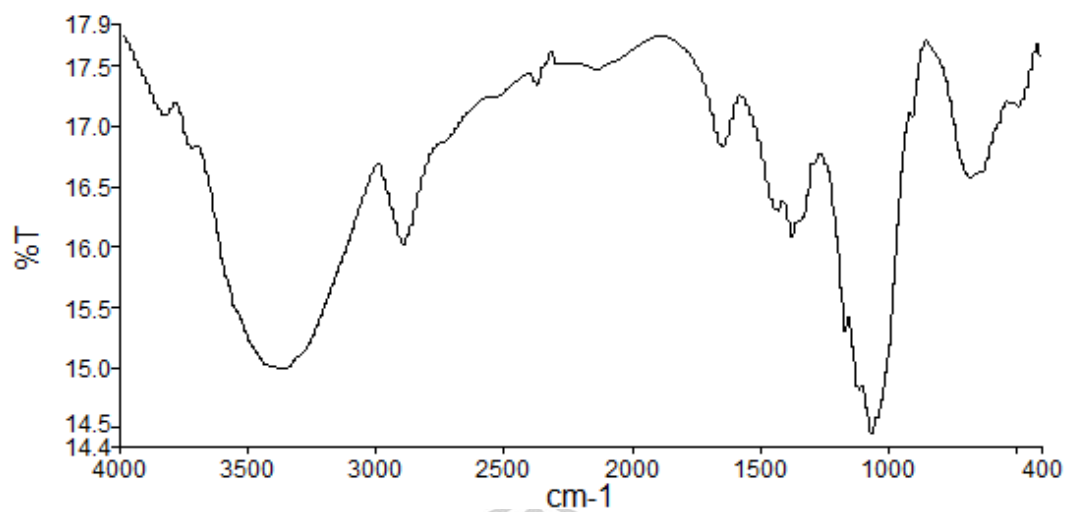
### Instrument

Instrument Model Frontier FT-IR  
Instrument Serial Number 96681  
Software Revision CPU32 Main 00.09.9951 07-September-2011 11:49:41  
Number of Scans 3  
Resolution 4

### History

Who	What	When	Parameters	Comment
Administrator	Created as New Dataset	8/7/2018 11:12:53 PM		Sample Avicel PH 102 By Administrator Date Tuesday, August 07 2018
Administrator	Atmospheric Correction	8/7/2018 11:12:53 PM		
Administrator	DataTuneUp	8/7/2018 11:14:35 PM	"Desi Melani Avicel PH 102", "AutoSmooth", "AutoFlat2", "4000", "400"	
Administrator	Smooth	8/7/2018 11:14:41 PM	"Desi Melani Avicel PH 102_1", 45.00, 1, "Result.sp"	

### Spectrum Graph

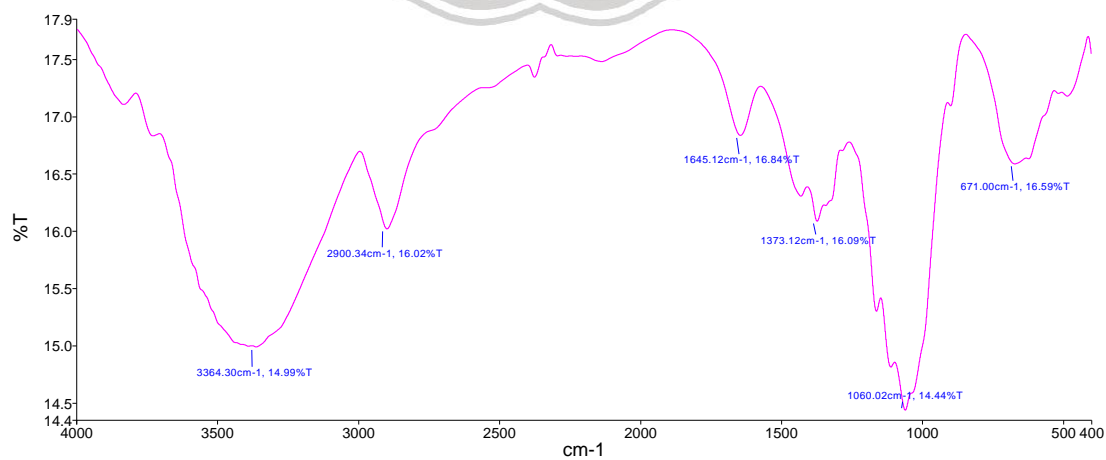


Name	Description
Desi Melani Avicel PH 102_1	Sample Avicel PH 102 By Administrator Date Tuesday, August 07 2018

### Peak Table Results

SpectrumName
Desi Melani Avicel PH 102_1

PeakName	X	Y
6	671	16.59
5	1060.02	14.44
4	1373.12	16.09
3	1645.12	16.84
2	2900.34	16.02
1	3364.3	14.99

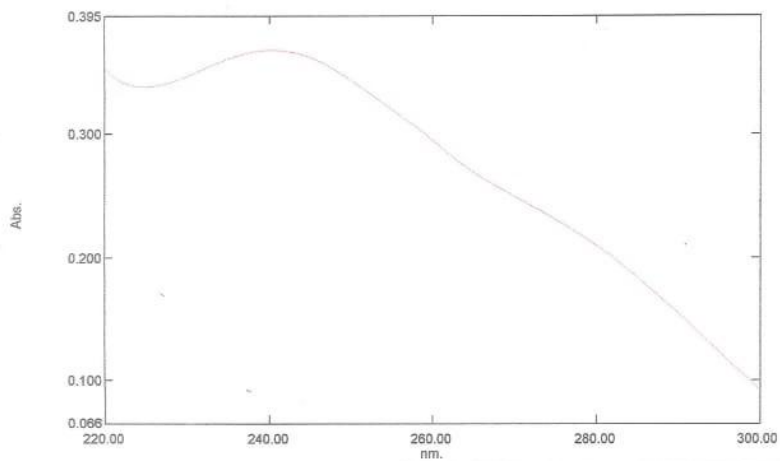


## Lampiran 6. Hasil Analisis Spektrometri

### Spectrum Peak Pick Report

04/30/2018 12:42:17 PM

Data Set: repeat 656\_123504 - RawData-002



[Measurement Properties]

Wavelength Range (nm.): 220.00 to 300.00  
 Scan Speed: Medium  
 Sampling Interval: 0.2  
 Auto Sampling Interval: Disabled  
 Scan Mode: Repeat

No.	P/V	Wavelength	Abs.	Description
1		240.20	0.368	

[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: 8-Cell  
 Number of cells: 1

[Operation]

Threshold: 0.0010000  
 Points: 4  
 Interpolate: Disabled  
 Average: Disabled

[Sample Preparation Properties]

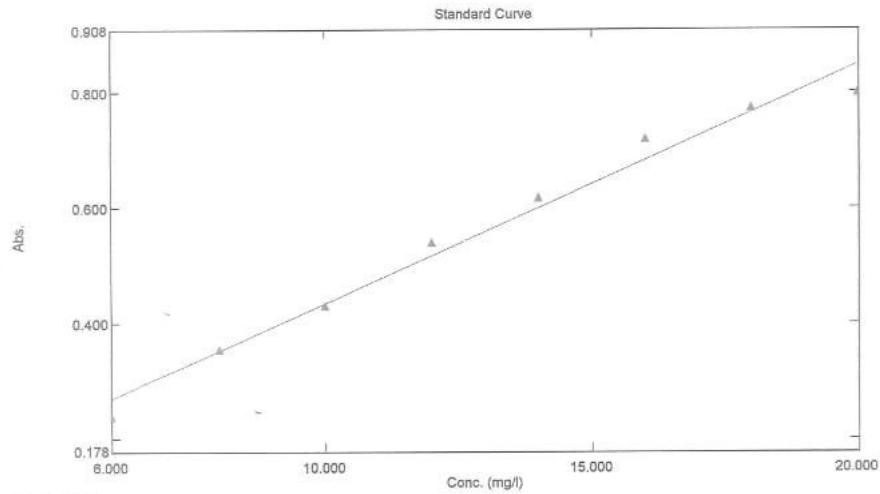
Weight:  
 Volume:  
 Dilution:  
 Path Length:  
 Additional Information:

KB2

## Standard Table Report

04/30/2018 02:38:49 PM

File Name: C:\Users\HP\Documents\File\_180430\_135115.pho



Standard Table

	Sample ID	Type	Ex	Conc	WL240.2	Wgt.Factor	Comments
1	6 ppm	Standard		6.000	0.239	1.000	
2	8 ppm	Standard		8.000	0.355	1.000	
3	10 ppm	Standard		10.000	0.430	1.000	
4	12 ppm	Standard		12.000	0.540	1.000	
5	14 ppm	Standard		14.000	0.617	1.000	
6	16 ppm	Standard		16.000	0.718	1.000	
7	18 ppm	Standard		18.000	0.772	1.000	
8	20 ppm	Standard		20.000	0.798	1.000	
9							

### Lampiran 7. Hasil Uji *Recovery* Sistem Dispersi Padat Permukaan

#### 1. Dispersi padat permukaan AVICEL PH 102 (1:1)

##### - Data Penimbangan

Replikasi	Kertas Kosong (g)	Kertas + isi (g)	Kertas + sisa (g)	Berat Total (g)
I	0.3264	0.4267	0.3262	0.1005
II	0.3365	0.4369	0.3360	0.1009
III	0.3506	0.4509	0.3503	0.1006

##### - Perhitungan *Recovery*

Replikasi	Abs	FP	Jumlah terlarut (mg)	<i>Recovery</i> (%)
I	0.466	50	53.703	107.41
II	0.455	50	52.457	104.91
III	0.432	50	49.853	99.70

Rata-rata PK : 52.004 mg

#### 2. Dispersi padat permukaan AVICEL PH 102 (1:4)

##### - Data Penimbangan

Replikasi	Kertas Kosong (g)	Kertas + isi (g)	Kertas + sisa (g)	Berat Total (g)
I	0.3260	0.4277	0.3271	0.1006
II	0.3365	0.4370	0.3361	0.1009
III	0.3506	0.4520	0.3517	0.1003

##### - Perhitungan *Recovery*

Replikasi	Abs	FP	Jumlah terlarut (mg)	<i>Recovery</i> (%)
I	0.430	20	19.850	99.25
II	0.439	20	20.258	101.29
III	0.456	20	21.028	105.14

Rata-rata PK : 20.379 mg

#### 3. Dispersi padat permukaan AVICEL PH 102 (1:9)

##### - Data Penimbangan

Replikasi	Kertas Kosong (g)	Kertas + isi (g)	Kertas + sisa (g)	Berat Total (g)
I	0.3310	0.4316	0.3316	0.1000
II	0.3366	0.4369	0.3366	0.1003
III	0.3429	0.4430	0.3429	0.1001

- Perhitungan Recovery

Replikasi	Abs	FP	Jumlahterlarut (mg)	Recovery (%)
I	0.440	10	10.152	101.52
II	0.432	10	9.970	99.70
III	0.428	10	9.880	98.80

Rata-rata PK : 10.001 mg

4. CAMPURAN FISIK AVICEL PH 102 (1:9)

- Data Penimbangan

Replikasi	KertasKosong (g)	Kertas + isi (g)	Kertas + sisa (g)	Berat Total (g)
I	0.3412	0.4413	0.3412	0.1001
II	0.3324	0.4327	0.3325	0.1002
III	0.3431	0.4435	0.3432	0.1003

- Perhitungan Recovery

Replikasi	Abs	FP	Jumlahterlarut (mg)	Recovery (%)
I	0.400	10	9.246	92.46
II	0.476	10	10.967	109.67
III	0.461	10	10.627	106.27

Rata-rata PK : 10.280 mg

5. ATORVASTATIN MURNI REKRISTALISASI

- Data Penimbangan

Replikasi	KertasKosong (g)	Kertas + isi (g)	Kertas + sisa (g)	Berat Total (g)
I	0.3361	0.4363	0.3362	0.1001
II	0.3521	0.4524	0.3522	0.1002
III	0.3447	0.4447	0.3443	0.1004

- Perhitungan Recovery

Replikasi	Abs	FP	Jumlahterlarut (mg)	Recovery (%)
I	0.455	10	104.915	104.91
II	0.432	10	99.705	99.70
III	0.441	10	101.744	101.74

Rata-rata PK : 102.121 mg



### Lampiran 8. Perhitungan Disolusi dan DE<sub>60</sub> Sistem Dispersi Padat Permukaan Atorvastatin Kalsium.

#### 1. Dispersi padat permukaan 1:1

##### - Data Penimbangan

Replikasi	Kertas Kosong (g)	Kertas + isi (g)	Kertas + sisa (g)	Berat Total (g)
I	0.3451	0.4455	0.3452	0.1003
II	0.3270	0.4275	0.3273	0.1002
III	0.3651	0.4653	0.3650	0.1003

##### - Data Perhitungan Disolusi

#### Replikasi I

Menit	Abs	Kadar mcg/ml	kadar mg/ml	jumlah (mg)	faktor Koreksi	jumlah terkoreksi	% Terlarut
0	0	0	0	0	0		
5	0.234	10.972	0.011	9.875	0	9.875	18.988
15	0.468	21.572	0.022	19.415	0.055	19.470	37.438
30	0.732	33.531	0.034	30.178	0.163	30.341	58.343
45	0.769	35.207	0.035	31.687	0.330	32.017	61.566
60	0.858	39.239	0.039	35.315	0.506	35.821	68.881

JARAK MEN	Luas Area	
	1	47.470
5	2	282.130
10	3	718.356
15	4	899.311
15	5	978.353
15	Y.dt	2925.619
	y100.t	6000
	DE60	0.488

%DE60	48.760
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#### Replikasi II

Menit	Abs	Kadar mcg/ml	kadar mg/ml	jumlah (mg)	Faktor Koreksi	jumlah terkoreksi	% Terlarut
0	0	0	0	0	0		
5	0.210	9.884	0.010	8.896	0	8.896	17.106
15	0.401	18.537	0.019	16.683	0.049	16.733	32.175
30	0.659	30.224	0.030	27.202	0.142	27.344	52.580
45	0.808	36.974	0.037	33.277	0.293	33.570	64.552
60	0.893	40.824	0.041	36.742	0.478	37.220	71.571

JARAK MEN	Luas Area	
	1	42.766
5	2	246.407
10	3	635.663
15	4	878.486
15	5	1020.919
15	Y.dt	2824.242
	y100.t	6000
	DE60	0.471

%DE60	47.071
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### Replikasi III

Menit	Abs	Kadar mcg/ml	kadar mg/ml	jumlah (mg)	faktor koreksi	jumlah terkoreksi	% Terlarut
0	0	0	0	0	0		
5	0.183	8.661	0.009	7.795	0	7.795	14.990
15	0.459	21.164	0.021	19.048	0.043	19.091	36.710
30	0.741	33.939	0.034	30.545	0.149	30.694	59.022
45	0.698	31.991	0.032	28.792	0.319	29.111	55.977
60	0.736	33.712	0.034	30.341	0.479	30.820	59.264

JARAK MEN	Luas Area	
	1	37.474
5	2	258.500
10	3	717.993
15	4	862.493
15	5	864.308
15	Y.dt	2740.768
	y100.t	6000.000
	DE60	0.457

%DE60	45.679
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## 2. Dispersi padat permukaan 1:4

### - Data Penimbangan

Replikasi	Kertas Kosong (g)	Kertas + isi (g)	Kertas + sisa (g)	Berat Total (g)
I	0.3548	0.4559	0.3550	0.1009
II	0.3410	0.4416	0.3413	0.1003
III	0.3566	0.4574	0.3569	0.1005

## - Data Perhitungan Disolusi

## Replikasi I

Menit	Abs	Kadar mcg/ml	kadar mg/ml	jumlah (mg)	faktor koreksi	jumlah terkoreksi	% Terlarut
0	0	0	0	0	0		
5	0.156	3.719	0.004	3.347	0	3.347	16.425
15	0.580	13.323	0.013	11.990	0.019	12.009	58.929
30	0.690	15.814	0.016	14.233	0.085	14.318	70.259
45	0.724	16.584	0.017	14.926	0.164	15.090	74.048
60	0.957	21.862	0.022	19.676	0.247	19.923	97.762

JARAK MEN	Luas Area	
	1	41.062
5	2	376.768
10	3	968.906
15	4	1082.300
15	5	1288.571
15	Y.dt	3757.607
	y100.t	6000
	DE60	0.626

%DE60	62.627
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## Replikasi II

Menit	Abs	Kadar mcg/ml	kadar mg/ml	jumlah (mg)	faktor koreksi	jumlah terkoreksi	% Terlarut
0	0	0	0	0	0		
5	0.143	3.425	0.003	3.082	0	3.082	15.124
15	0.536	12.326	0.012	11.094	0.017	11.111	54.520
30	0.772	17.672	0.018	15.904	0.079	15.983	78.430
45	0.725	16.607	0.017	14.946	0.167	15.113	74.162
60	0.844	19.302	0.019	17.372	0.250	17.622	86.473

JARAK MEN	Luas Area	
	1	37.811
5	2	348.223
10	3	997.123
15	4	1144.435
15	5	1204.759
15	Y.dt	3732.351
	y100.t	6000
	DE60	0.622

%DE60	62.206
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## Replikasi III

Menit	Abs	kadar mcg/ml	kadar mg/ml	jumlah (mg)	faktor koreksi	jumlah terkoreksi	% Terlarut
0	0	0	0	0	0		
5	0.139	3.334	0.003	3.001	0	3.001	14.724
15	0.472	10.877	0.011	9.789	0.017	9.806	48.116
30	0.722	16.539	0.017	14.885	0.071	14.956	73.390
45	0.723	16.562	0.017	14.906	0.154	15.059	73.896
60	0.903	20.639	0.021	18.575	0.237	18.811	92.308

JARAK MEN	Luas Area	
	1	36.811
5	2	314.202
10	3	911.298
15	4	1104.648
15	5	1246.529
15	Y.dt	3613.488
	y100.t	6000
	DE60	0.602

%DE60	60.225
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## 3. Dispersi padat permukaan 1:9

## - Data Penimbangan

Replikasi	Kertas Kosong (g)	Kertas + isi (g)	Kertas + sisa (g)	Berat Total (g)
I	0.3412	0.4419	0.3413	0.1006
II	0.3410	0.4421	0.3412	0.1009
III	0.3431	0.4440	0.3431	0.1008

## - Data Perhitungan Disolusi

## Replikasi I

Menit	Abs	Kadar mcg/ml	kadar mg/ml	jumlah (mg)	faktor koreksi	jumlah terkoreksi	% Terlarut
0	0	0	0	0	0		
5	0.275	6.414	0.006	5.773	0	5.773	57.726
15	0.350	8.113	0.008	7.302	0.032	7.334	73.334
30	0.344	7.977	0.008	7.180	0.073	7.252	72.517
45	0.459	10.582	0.011	9.524	0.113	9.636	96.357
60	0.493	11.352	0.011	10.217	0.165	10.382	103.816

JARAK MEN	Luas Area	
	1	144.315
5	2	655.302
10	3	1093.886
15	4	1266.554
15	5	1501.299
15	Y.dt	4661.357
	y100.t	6000
	DE60	0.777

%DE60	77.689
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### Replikasi II

Menit	Abs	Kadar mcg/ml	kadar mg/ml	jumlah (mg)	faktor koreksi	jumlah terkoreksi	% Terlarut
0	0	0	0	0	0		
5	0.241	5.644	0.006	5.080	0	5.080	50.796
15	0.290	6.754	0.007	6.079	0.028	6.107	61.066
30	0.370	8.566	0.009	7.710	0.062	7.772	77.710
45	0.395	9.133	0.009	8.219	0.105	8.324	83.234
60	0.434	10.016	0.010	9.014	0.150	9.165	91.641

JARAK MEN	Luas Area	
	1	126.989
5	2	559.307
10	3	1040.821
15	4	1207.085
15	5	1311.563
15	Y.dt	4245.766
	y100.t	6000
	DE60	0.708

%DE60	70.763
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### Replikasi III

Menit	Abs	Kadar mcg/ml	kadar mg/ml	jumlah (mg)	faktor koreksi	jumlah terkoreksi	% Terlarut
0	0	0	0	0	0		
5	0.293	6.822	0.007	6.140	0	6.140	61.395
15	0.318	7.388	0.007	6.650	0.034	6.684	66.832
30	0.388	8.974	0.009	8.077	0.071	8.148	81.470
45	0.406	9.382	0.009	8.443	0.116	8.559	85.588
60	0.407	9.404	0.009	8.464	0.163	8.627	86.260

JARAK MEN	Luas Area	
	1	153.488
5	2	641.136
10	3	1112.265
15	4	1252.931
15	5	1288.861
15	Y.dt	4448.681
	y100.t	6000
	DE60	0.741

%DE60	74.145
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#### 4. ATORVASTATIN KALSIMUM MURNI

##### - Data Penimbangan

Replikasi	Kertas Kosong (g)	Kertas + isi (g)	Kertas + sisa (g)	Berat Total (g)
I	0.3464	0.4471	0.3466	0.1005
II	0.3530	0.4544	0.3542	0.1002
III	0.3398	0.4399	0.3395	0.1004

##### - Data Perhitungan Disolusi

##### Replikasi I

Menit	Abs	Kadar mcg/ml	kadar mg/ml	jumlah (mg)	faktor koreksi	jumlah terkoreksi	% Terlarut
0	0	0	0	0	0		
5	0.113	5.490	0.005	4.941	0	4.941	4.941
15	0.430	19.851	0.020	17.865	0.027	17.893	17.893
30	0.640	29.364	0.029	26.427	0.127	26.554	26.554
45	0.729	33.395	0.033	30.056	0.274	30.329	30.329
60	0.935	42.727	0.043	38.454	0.440	38.895	38.895

JARAK MEN	Luas Area	
	1	12.353
5	2	114.171
10	3	333.351
15	4	426.623
15	5	519.181
15	Y.dt	1405.680
	y100.t	6000
	DE60	0.234

%DE60	23.428
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## Replikasi II

Menit	Abs	Kadar mcg/ml	kadar mg/ml	jumlah (mg)	faktor koreksi	jumlah terkoreksi	% Terlarut
0	0	0	0	0	0		
5	0.201	9.477	0.009	8.529	0	8.529	8.529
15	0.333	15.456	0.015	13.911	0.047	13.958	13.958
30	0.592	27.189	0.027	24.470	0.125	24.595	24.595
45	0.782	35.796	0.036	32.217	0.261	32.477	32.477
60	0.879	40.190	0.040	36.171	0.440	36.611	36.611

JARAK MEN	Luas Area	
	1	21.323
5	2	112.436
10	3	289.148
15	4	428.040
15	5	518.160
15	Y.dt	1369.107
	y100.t	6000
	DE60	0.228

%DE60	22.818
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## Replikasi III

Menit	Abs	Kadar mcg/ml	kadar mg/ml	jumlah (mg)	faktor koreksi	jumlah terkoreksi	% Terlarut
0	0	0	0	0	0		
5	0.258	12.059	0.012	10.853	0	10.853	10.853
15	0.314	14.596	0.015	13.136	0.060	13.196	13.196
30	0.543	24.969	0.025	22.472	0.133	22.606	22.606
45	0.798	36.521	0.037	32.869	0.258	33.127	33.127
60	0.835	38.197	0.038	34.377	0.441	34.818	34.818

JARAK MEN	Luas Area	
	1	27.133
5	2	120.247
10	3	268.516
15	4	417.995
15	5	509.588
15	Y.dt	1343.479
	y100.t	6000
	DE60	0.224

%DE60	22.391
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## 5. ATORVASTATIN KALSIUM REKRISTALISASI

## - Data Penimbangan

Replikasi	Kertas Kosong (g)	Kertas + isi (g)	Kertas + sisa (g)	Berat Total (g)
I	0.3236	0.4238	0.3231	0.1007
II	0.3504	0.4509	0.35071	0.1002
III	0.3346	0.4346	0.3341	0.1005

## - Data Perhitungan Disolusi

## Replikasi I

Menit	Abs	Kadar mcg/ml	kadar mg/ml	jumlah (mg)	faktor koreksi	jumlah terkoreksi	% Terlarut
0	0	0	0	0	0		
5	0.289	13.463	0.013	12.117	0	12.117	11.865
15	0.400	18.492	0.018	16.642	0.067	16.710	16.363
30	0.434	20.032	0.020	18.029	0.160	18.188	17.810
45	0.647	29.681	0.030	26.713	0.260	26.973	26.412
60	0.741	33.939	0.034	30.545	0.408	30.953	30.310

JARAK MEN	Luas Area		
	1	29.663	
5	2	141.138	
10	3	256.297	
15	4	331.669	
15	5	425.418	%DE60
15	Y.dt	1184.186	19.736
	y100.t	6000	
	DE60	0.197	

## Replikasi II

Menit	Abs	Kadar mcg/ml	kadar mg/ml	jumlah (mg)	faktor koreksi	jumlah terkoreksi	% Terlarut
0	0	0	0	0	0		
5	0.278	12.965	0.013	11.668	0	11.668	11.426
15	0.391	18.084	0.018	16.275	0.065	16.340	16.001
30	0.440	20.304	0.020	18.273	0.155	18.428	18.046
45	0.692	31.719	0.032	28.547	0.257	28.804	28.206
60	0.761	34.845	0.035	31.360	0.415	31.776	31.116



JARAK MEN	Luas Area	
	1	28.565
5	2	137.134
10	3	255.347
15	4	346.883
15	5	444.909
15	Y.dt	1212.838
	y100.t	6000
	DE60	0.202

%DE60	20.214
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### Replikasi III

Menit	Abs	Kadar mcg/ml	kadar mg/ml	jumlah (mg)	faktor koreksi	jumlah terkoreksi	% Terlarut
0	0	0	0	0	0		
5	0.262	12.240	0.012	11.016	0	11.016	10.787
15	0.376	17.404	0.017	15.664	0.061	15.725	15.398
30	0.423	19.533	0.020	17.580	0.148	17.728	17.360
45	0.648	29.726	0.030	26.753	0.246	26.999	26.438
60	0.732	33.531	0.034	30.178	0.395	30.573	29.937

JARAK MEN	Luas Area	
	1	26.968
5	2	130.928
10	3	245.688
15	4	328.487
15	5	422.818
15	Y.dt	1154.889
	y100.t	6000
	DE60	0.192

%DE60	19.248
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### 6. CAMPURAN FISIK 1:9

- Data Penimbangan

Replikasi	Kertas Kosong (g)	Kertas + isi (g)	Kertas + sisa (g)	Berat Total (g)
I	0.3412	0.4413	0.3412	0.1001
II	0.3324	0.4327	0.3325	0.1002
III	0.3431	0.4435	0.3432	0.1003

## - Data Perhitungan Disolusi

## Replikasi I

Menit	Abs	Kadar mcg/ml	kadar mg/ml	jumlah (mg)	faktor koreksi	jumlah terkoreksi	% Terlarut
0	0	0	0	0	0		
5	0.151	3.606	0.004	3.245	0	3.245	31.569
15	0.209	4.920	0.005	4.428	0.018	4.446	43.245
30	0.249	5.826	0.006	5.243	0.043	5.286	51.416
45	0.400	9.246	0.009	8.321	0.072	8.393	81.642
60	0.480	11.058	0.011	9.952	0.118	10.070	97.956

JARAK MEN	Luas Area	
	1	78.922
5	2	374.070
10	3	709.963
15	4	997.941
15	5	1346.987
15	Y.dt	3507.883
	y100.t	6000
	DE60	0.585

%DE60	58.465
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## Replikasi II

Menit	Abs	Kadar mcg/ml	kadar mg/ml	jumlah (mg)	faktor koreksi	jumlah terkoreksi	% Terlarut
0	0	0	0	0	0		
5	0.140	3.357	0.003	3.021	0	3.021	29.387
15	0.182	4.308	0.004	3.877	0.017	3.894	37.879
30	0.330	7.660	0.008	6.894	0.038	6.933	67.437
45	0.345	8.000	0.008	7.200	0.077	7.277	70.784
60	0.395	9.133	0.009	8.219	0.117	8.336	81.087

JARAK MEN	Luas Area	
	1	73.469
5	2	336.333
10	3	789.868
15	4	1036.650
15	5	1139.032
15	Y.dt	3375.352
	y100.t	6000
	DE60	0.563

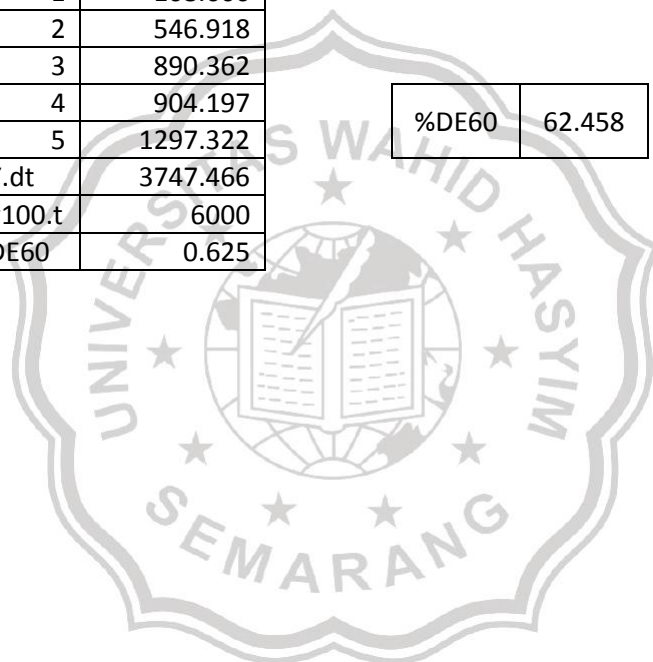
%DE60	56.256
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## Replikasi III

Menit	Abs	Kadar mcg/ml	kadar mg/ml	jumlah (mg)	faktor koreksi	jumlah terkoreksi	% Terlarut
0	0	0	0	0	0		
5	0.211	4.965	0.005	4.468	0	4.468	43.466
15	0.323	7.502	0.008	6.752	0.025	6.776	65.917
30	0.255	5.961	0.006	5.365	0.062	5.428	52.798
45	0.329	7.638	0.008	6.874	0.092	6.966	67.762
60	0.516	11.873	0.012	10.686	0.130	10.816	105.215

JARAK MEN	Luas Area	
	1	108.666
5	2	546.918
10	3	890.362
15	4	904.197
15	5	1297.322
15	Y.dt	3747.466
	y100.t	6000
	DE60	0.625

%DE60	62.458
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## Lampiran 9. Hasil Uji Statistik One way Anova

### Uji Normalitas

#### Tests of Normality

DPP	Kolmogorov-Smirnov <sup>a</sup>			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
DE60 DPP 1:1	.193	3	.	.997	3	.891
DPP 1:4	.324	3	.	.876	3	.313
DPP 1:9	.177	3	.	1.000	3	.974
AK MURNI	.214	3	.	.989	3	.802
AK RE	.176	3	.	1.000	3	.988
CF 1:9	.188	3	.	.998	3	.910

a. Lilliefors Significance Correction

Kesimpulan : Data terdistribusi Normal karena nilai sig.>0.05

### Uji Homogenitas

#### Test of Homogeneity of Variances

DE60

Levene Statistic	df1	df2	Sig.
1.819	5	12	.184

Kesimpulan : data mempunyai varian yang homogen karena nilai sig.>0.05 sehingga data termasuk statistik parametrik dilanjutkan uji one way anova.

#### ANOVA

DE60	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	7368.862	5	1473.772	305.623	.000
Within Groups	57.866	12	4.822		
Total	7426.728	17			

Kesimpulan : nilai sig.<0.05 artinya data terdapat perbedaan yg bermakna sehingga dilanjutkan ujian LSD.

## Multiple Comparisons

DE60

LSD

(I) DPP	(J) DPP	Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval	
					Lower Bound	Upper Bound
DPP 1:1	DPP 1:4	-14.39000*	1.79298	.000	-18.2966	-10.4834
	DPP 1:9	-27.55333*	1.79298	.000	-31.4599	-23.6468
	AK MURNI	24.44000*	1.79298	.000	20.5334	28.3466
	AK RE	27.23333*	1.79298	.000	23.3268	31.1399
	CF 1:9	-12.33667*	1.79298	.000	-16.2432	-8.4301
DPP 1:4	DPP 1:1	14.39000*	1.79298	.000	10.4834	18.2966
	DPP 1:9	-13.16333*	1.79298	.000	-17.0699	-9.2568
	AK MURNI	38.83000*	1.79298	.000	34.9234	42.7366
	AK RE	41.62333*	1.79298	.000	37.7168	45.5299
	CF 1:9	2.05333	1.79298	.274	-1.8532	5.9599
DPP 1:9	DPP 1:1	27.55333*	1.79298	.000	23.6468	31.4599
	DPP 1:4	13.16333*	1.79298	.000	9.2568	17.0699
	AK MURNI	51.99333*	1.79298	.000	48.0868	55.8999
	AK RE	54.78667*	1.79298	.000	50.8801	58.6932
	CF 1:9	15.21667*	1.79298	.000	11.3101	19.1232
AK MURNI	DPP 1:1	-24.44000*	1.79298	.000	-28.3466	-20.5334
	DPP 1:4	-38.83000*	1.79298	.000	-42.7366	-34.9234
	DPP 1:9	-51.99333*	1.79298	.000	-55.8999	-48.0868
	AK RE	2.79333	1.79298	.145	-1.1132	6.6999
	CF 1:9	-36.77667*	1.79298	.000	-40.6832	-32.8701
AK RE	DPP 1:1	-27.23333*	1.79298	.000	-31.1399	-23.3268
	DPP 1:4	-41.62333*	1.79298	.000	-45.5299	-37.7168
	DPP 1:9	-54.78667*	1.79298	.000	-58.6932	-50.8801
	AK MURNI	-2.79333	1.79298	.145	-6.6999	1.1132
	CF 1:9	-39.57000*	1.79298	.000	-43.4766	-35.6634
CF 1:9	DPP 1:1	12.33667*	1.79298	.000	8.4301	16.2432
	DPP 1:4	-2.05333	1.79298	.274	-5.9599	1.8532

DPP 1:9	-15.21667*	1.79298	.000	-19.1232	-11.3101
AK MURNI	36.77667*	1.79298	.000	32.8701	40.6832
AK RE	39.57000*	1.79298	.000	35.6634	43.4766

Nilai sig.<0.05 = ada perbedaan yang bermakna

Nilai sig.>0.05 = tidak ada perbedaan yang bermakna

Kesimpulan uji LSD:

Dari kelompok dispersi padat permukaan (1:1, 1:4, 1:9) dan campuran fisik (1:9) dibandingkan dengan atorvastatin kalsium murni diperoleh nilai sig.<0.05 sehingga terdapat perbedaan bermakna, artinya ada pengaruh dalam penambahan pembawa Avicel PH 102 baik pada metode disperse padat permukaan maupun penambahan secara fisik dalam meningkatkan laju disolusi atorvastatin kalsium. Sedangkan kelompok atorvastatin kalsium hasil rekristalisasi dibandingkan dengan atorvastatin kalsium murni diperoleh nilai sig.>0.05 sehingga tidak terdapat perbedaan bermakna, artinya proses rekristalisasi tidak berpengaruh terhadap laju disolusi atorvastatin kalsium.