BAB V

KESIMPULAN DAN SARAN

A. Kesimpulan

1. Penambahan proporsi HPMC K15M yang dapat meningkatkan kekerasan, meperbaiki waktu alir, mengontrol pelepasan, menigkatkan swelling index dan adanya daya mukoadhesif.
2. Kinetika pelepasan tablet mukoadhesif nifedipin menggunakan matriks Na alginat dan HPMC K15M mengikuti kinetika pelepasan orde nol dengan model *Higuchi*.
3. Formula optimum untuk tablet mukoadhesif nifedipin diperoleh pada proprosi 49 mg HPMC K15M dan 21 mg Na alginat.

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LAMPIRAN

Lampiran 1. Perhitungan bahan

komposisi	Kandungan per tablet (mg)				
	Formula 1	Formula 2	Formula 3	Formula 4	Formula 5
Nifedipin	20,00	20,00	20,00	20,00	20,00
Na-Alginat	25,00	33,75	27,50	18,75	10,00
HPMC K15M	45,00	36,25	42,50	51,25	60,00
Avicel PH 101	145,00	145,00	145,00	145,00	145,00
PVP	7,50	7,50	7,50	7,50	7,50
Mg stearat	2,50	2,50	2,50	2,50	2,50
Bobot tablet	250	250	250	250	250

Tiap formula dibuat sebanyak 100 tablet dengan masing-masing berat 250 mg. Dapat dihitung dengan cara sebagai berikut:

- **Formula 1**

1. Nifedipin 20 mg x 100 = 2000 mg
2. Na alginat 25 mg x 100 = 2500 mg
3. HPMC K15 45 mg x 100 = 4500 mg
4. Avicel PH 101 145 x 100 = 14500 mg
5. PVP 7,5 x 100 = 750 mg
6. Mg stearat 2,5 x 100 mg = 250 mg

- **Formula 2**

1. Nifedipin 20 mg x 100 = 2000 mg
2. Na alginat 33,75 x 100 = 3375 mg
3. HPMC K15 36,25 x 100 = 3625 mg
4. Avicel PH 101 145 x 100 = 14500 mg
5. PVP 7,5 x 100 = 750 mg
6. Mg stearat 2,5 x 100 = 250 mg

- **Formula 3**

1. Nifedipin 20 mg x 100 = 2000 mg
2. Na alginat 27,50 mg x 100 = 2750 mg
3. HPMC K15 42,50 mg x 100 = 4250 mg
4. Avicel PH 101 145 mg x 100 = 14500 mg
5. PVP 7,5 mg x 100 = 750 mg
6. Mg stearat 2,5 mg x 100 = 250 mg

- **Formula 4**

1. Nifedipin 20 mg x 100 = 2000 mg
2. Na alginat 18,75 x 100 = 1875 mg
3. HPMC K15 51,25 mg x 100 = 5125 mg
4. Avicel PH 101 145 x 100 = 14500 mg
5. PVP 7,5 mg x 100 = 750 mg
6. Mg stearat 2,5 mg x 100 = 250 mg

- **Formula 5**

1. Nifedipin 20 mg x 100 = 2000 mg
2. Na-Alginat 45 mg x 100 = 4500 mg
3. HPMC K15 25 mg x 100 = 2500 mg
4. Avicel PH 101 145 x 100 = 14500 mg
5. PVP 7,5 mg x 100 = 750 mg
6. Mg stearat 2,5 mg x 100 = 250 mg

Lampiran 2. Pemeriksaan sifat fisik granul tablet lepas lambat nifedipin mukoadhesif.

Kandungan Lembab (MC)(%)

Replikasi	Kandungan lembab (%)				
	F1	F2	F3	F4	F5
1.	5,00	4,50	6,00	5,50	6,10
2.	4,50	5,00	5,00	4,50	5,50
3.	5,00	4,50	4,40	4,50	5,10
Rata – rata	4,833	4,667	5,133	4,833	5,533
SD	0,289	0,289	0,808	0,577	0,451

Waktu alir (detik)

Replikasi	Waktu alir (detik)				
	F1	F2	F3	F4	F5
1.	9,333	9,418	11,258	10.667	8,167
2.	9,333	9,418	11,258	10.667	8,167
3.	9,333	9.418	11,258	10.667	8,167
Rata-rata	9,333	9,418	11,258	10,667	8,167
SD	0,000	0,000	0,000	0,000	0,000

Lampiran 3. Pemeriksaan kekerasan dan kesergaman kandungan

Kekerasan tablet

Replikasi	Kekerasan tablet (kg)				
	F1	F2	F3	F4	F5
1.	13,5	13,4	13,0	12,2	12,9
2.	13,5	13,4	13,5	12,2	12,6
3.	13,5	13,5	13,5	12,2	12,5
Rata-rata	13,5	13,4	13,33	12,2	12,7
SD	0,000	0,06	0,289	0,00	0,208

- **Pengujian keseragaman kandungan**

F1 = 100% Na alginat : 0% HPMC K15M

Tablet	Bobot tablet (mg)	Absorbansi	Konsentrasi (ppm)	Kandungan (mg)	Kandungan (%)
1.	253	0,770	12,784	20,24	99,879
2.	256	0,743	12,319	20,48	96,242
3.	254	0,758	12,578	20,32	98,262
4.	254	0,793	13,181	20,32	102,977
5.	257	0,770	12,784	20,56	99,879
6.	253	0,770	12,784	20,24	99,879
7.	256	0,743	12,319	20,48	96,242
8.	256	0,743	12,319	20,48	96,242
9.	257	0,770	12,784	20,56	99,879
10.	254	0,793	13,181	20,32	102,997
Rata-rata	255	0.765	12,703	20,40	99,246
SD				0,125	2,527

F2 = 75% Na alginat : 25% HPMC K15M

Tablet	Bobot tablet (mg)	Absorbansi	Konsentrasi (ppm)	Kandungan (mg)	Kandungan (%)
1.	259	0,753	12,491	20,72	97.589
2.	258	0,759	12,595	20,64	98,397
3.	259	0,782	12,991	20,72	101,495
4.	254	0,745	12,353	20,32	96,511
5.	257	0,742	12,302	20,56	96,107
6.	258	0,759	12,595	20,64	98,397
7.	259	0,753	12,491	20,72	97,589
8.	254	0,745	12,353	20,32	96,511
9.	257	0,742	12,302	20,56	96,107
10.	258	0,759	12,595	20,64	98,397
Rata-rata	257,3	0,754	12,507	20,58	97,710
SD				0,151	1,625

F3 = 50% Na alginat : 50% HPMC K15M

Tablet	Bobot tablet (mg)	Absorbansi	Konsentrasi (ppm)	Kandungan (mg)	Kandungan (%)
1.	255	0,751	12,457	20,24	97,320
2.	258	0,782	12,991	20,48	101,495
3.	253	0,795	13,216	20,32	103,246
4.	256	0,776	12,888	20,32	100,687
5.	248	0,778	12,922	20,56	100,956
6.	253	0,795	13,216	20,24	103,246
7.	255	0,751	12,457	20,48	97,320
8.	248	0,778	12,922	20,48	100,956
9.	253	0,795	13,216	20,56	103,246
10.	248	0,778	12,922	20,32	100,956
Rata-rata	252,7	0,779	12,921	20,40	100,943
SD				0,287	2,174

F4 = 25% Na alginat : 75% HPMC K15M

Tablet	Bobot tablet (mg)	Absorbansi	Konsentrasi (ppm)	Kandungan (mg)	Kandungan (%)
1.	257	0,763	12,664	20,56	98,936
2.	258	0,743	12,319	20,64	96,242
3.	258	0,755	12,526	20,64	97,858
4.	257	0,758	12,578	20,56	98,262
5.	250	0,794	13,198	20	103,112
6.	258	0,743	12,319	20,64	96,242
7.	257	0,763	12,664	20,56	98,936
8.	258	0,743	12,319	20,64	96,242
9.	250	0,794	13,198	20,00	103,112
10.	258	0,743	12,319	20,64	96,242
Rata-rata	256,1	0,753	12,610	20,48	97,670
SD				0,259	2,662

F5 = 10% Na alginat : 60% HPMC K15M

Tablet	Bobot tablet (mg)	Absorbansi	Konsnetrasi (ppm)	Kandungan (mg)	Kandungan (%)
1.	254	0,775	12,871	20,32	100,552
2.	258	0,723	11,974	20,64	93,548
3.	254	0,776	12,888	20,32	100,687
4.	251	0,785	13,043	20,08	101,899
5.	256	0,784	13,026	20,48	101,765
6.	251	0,785	13,043	20,08	101,899
7.	256	0,784	13,026	20,48	101,765
8.	258	0,723	11,974	20,64	93,548
9.	254	0,776	12,888	20,32	100,687
10.	251	0,785	13,043	20,08	101,899
Rata-rata	254,3	0,769	12,778	20,34	99,825
SD				0,217	3,354

Cara perhitungan keseragaman kandungan:

y = a + bx

rumus %keseragaman kandungan

$$\text{kandungan} = \frac{\frac{n}{1000}\, x Volume\ \ pengenceran x\ \ 100}{16} x100\%$$

Contoh salah satu perhitungan kandungan pada formula 5

langkah pertama menghitung konsentrasi (ppm) bobot tablet 254 didapat absorbansi 0,775.

0,775 = 0,0285 + 0,0580**x**

0,775-0,0285=0,0580**x**

x= $\frac{0,7645}{0,0580} = 12,871(ppm)$

langkah kedua menghitung kandungan dengan membagi antara bobot 1tablet dengan bobot yang dirancang 250 mg dikali 20 mg(nifedipin yang digunakan).

kandungan(mg) = $\frac{254}{250} x\ 20\ mg = 20,32\ mg$

langkah ketiga menghitung %kandungan didalam 1tablet dengan bobot 254 dengan pengenceran sebanyak 12,5 ml didapat dari 0,8 mL di ad kan kedalam 10 mL medium.

$$\textbf{\%kandungan} = \frac{\frac{12,871}{1000} \text{X} \frac{10}{0,8} \text{X } 100}{16} x100\% = 100,552\%$$

Penetapan kadar

- **Formula 1(100 : 0)**

Bobot 20 tablet (mg)	Absorbansi	ppm	Kadar (mg)	%
5068	0,585	9,594	18,451	92,257
	0,586	9,612	18,484	92,423
	0,587	9,629	18,517	92,589
Rata-rata	0,586	9,611	18,487	92,423
SD			0,033	0,165

- **Formula 2 (75 : 25)**

Bobot 20 tablet (mg)	Absorbansi	ppm	Kadar (mg)	%
5100	0,614	10,095	19,413	97,065
	0,620	10,198	19,612	98,060
	0,607	9,970	19,181	95,905
Rata-rata	0,613	9,594	19,402	97,010
SD			0,215	1,078

- **Formula 3 (50 :50)**

Bobot 20 tablet (mg)	Absorbansi	ppm	Kadar (mg)	%
5128	0,605	9,939	19,114	95,5736
	0,586	9,612	19,120	92,423
	0,98	9,818	18,882	94,413
Rata-rata	0,596	9,790	18,827	97,010
SD			0,318	1,593

- **Formula 4 (75 : 25)**

Bobot 20 tablet (mg)	Absorbansi	ppm	Kadar (mg)	%
5042	0,586	9,612	18,484	92,423
	0,586	9,612	18,484	92,423
	0,588	9,646	18,551	92,755
Rata-rata	0,586	9,623	18,506	92,534
SD			0,038	0,191

- **Formula 5 (0 : 100)**

Bobot 20 tablet (mg)	Absorbansi	ppm	Kadar (mg)	%
5140	0,583	9,560	18,385	91,926
	0,581	9,525	18,318	91,594
	0,582	9,543	18,351	91,760
Rata-rata	0,582	9,543	18,352	91,761
SD			0,033	0,165

Cara menghitung penetapan kadar

y = a + bx

rumus % penetapan kadar

$$\%\text{penetapan kadar} = \frac{kadar\ (mg)}{20} \text{ x } 100\%$$

Contoh salah satu perhitungan kandungan pada formula 5

langkah pertama menghitung konsentrasi (ppm) bobot tablet 5140 dari 20 tablet yang di gerus tiga kali replikasi didapat absorbansi pertama 0,583

0,583= 0,0285 + 0,0580**x**

0,583-0,0285=0,0580**x**

x= 0,5545 /0,0580= 9,560 (ppm)

langkah kedua menghitung kadar (mg) dalam 20 tablet yang digerus

$$\textbf{kadar(mg)} = \frac{50}{1,3} \text{ x } \frac{50}{1000} \text{ x } 9,650 = 18,385\text{mg}$$

langkah ketiga menghitung %kadar untuk 20 tablet yang digerus dibagi dengan bobot nifedipin yang digunakan.

$$\textbf{\%kadar} = \frac{18{,}385}{20} \text{ x } 100\% = 91{,}926$$

Kerapuhan

Replikasi / Formula	Bobot awal (mg)	Bobot akhir (mg)	%
F1 (100:0)	5082	5076	0,118
	5118	5110	0,156
	5116	5108	0,156
Rata-rata	5105,3	5098	0,143
SD	20,231	19,078	0,002
F2 (75:25)	5176	5168	0,154
	5192	5186	0,115
	5164	5156	0,154
Rata-rata	5177,3	5170	0,141
SD	14,047	15,099	0,023
F3 (50:50)	5700	5690	0,175
	5210	5202	0,153
	5202	5066	0,157
Rata-rata	5370	5319,3	0,162
SD	329,259	328,130	0,011
F4 (25:75)	5132	5122	0,194
	5176	5170	0,115
	5136	5130	0,116
Rata-rata	5148	5140,7	0,142
SD	24,331	25,716	0,045
F5 (0:100)	5140	5134	0,116
	5126	5118	0,156
	5664	5654	0,176
Rata-rata	5310	5302	0,149
SD	306,652	304,945	0,030

Cara menghitung kerapuhan

Sebanyak 20 tablet di timbang dengan seksama kemudian dibebas debukan dimasukkan kedalam friabilator selama 4 menit dan di timbang kembali dari debu untuk melihat % kerapuhan tablet dengan rumus:

$$\textbf{\%kerapuahan} = \frac{bobot\ \ awal - bobot\ \ akhir}{bobot\ \ awal} \text{ x } 100\%$$

Contoh perhitungan kerapuhan pada F5 replikasi 1

$$\textbf{\% kerapuhan} = \frac{5140 - 5134}{5140} \text{ x } 100\%$$

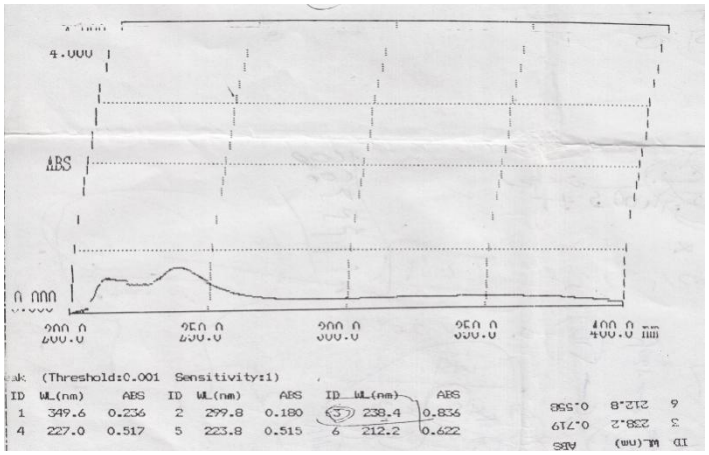
$$= 0{,}116\%$$

Daya mukoadhesif

Replikasi / Formula	Bobot (mg)	Kekuatan mukoadhesif (detik)
F1 (100:0)	253	12.26
	254	12.32
	256	12.34
Rata-rata	254	12.31
SD	1,527	0,041
F2 (75:25)	256	15.19
	255	15.25
	258	15.30
Rata-rata	256	15.25
SD	1,528	0,055
F3 (50:50)	254	20.15
	255	20.22
	255	20.35
Rata-rata	254	20.24
SD	0,577	0,101
F4 (25:75)	258	10.08
	257	10.12
	255	10.22
Rata-rata	257	10.14
SD	1,527	0,072
F5 (0:100)	256	8.07
	258	8.13
	259	8.30
Rata-rata	258	8.17
SD	1,527	0,119

Lampiran 4. Uji disolusi tablet sustained release nifedipin mukoadhesif.

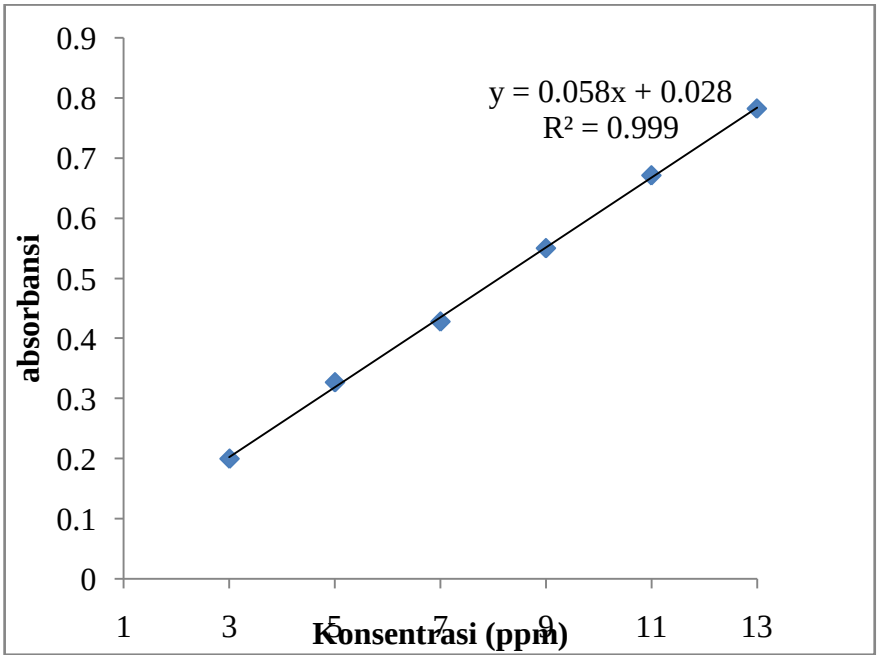
- Hasil pembacaan spektroskopi untuk panjang gelombang nifedipin



kurva baku

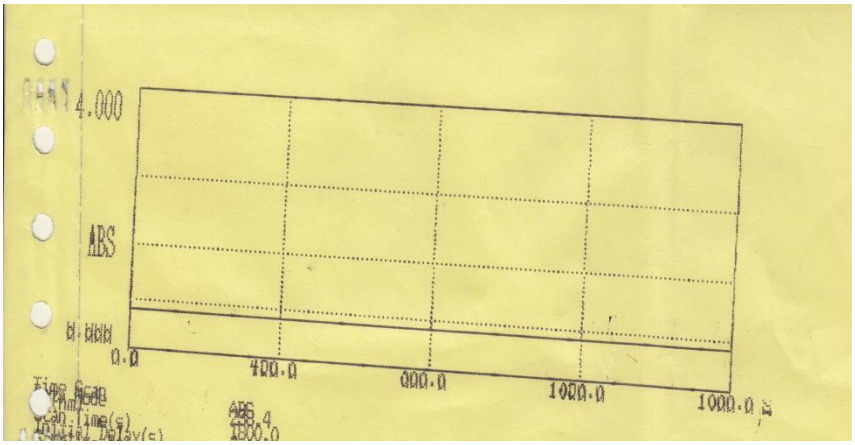
Konsentrasi (ppm)	Absorbansi
3	0,200
5	0,327
7	0,428
9	0,550
11	0,671
13	0,782

Regresi liner plot konsentrasi (ppm) dengan absorbansi
a= 0,028543
b=0,058057
r= 0,999704



Gambar kurva baku nifedipin

- Hasil pembacaan spektroskopi untuk operating time nifedipin



- Hasil uji disolusi tablaet mukoadhesif nifedipin F1 (100:0)

Replikasi 1

Menit	Abs	Fp	Kadar sampel	Kadar (ppm)	Jumlah (mg)	Terdisolusi (mg)	% Disolusi
0	0	0	0	0	0	0	**0**
5	0,088	1	1,026	1,026	0,923	0,92	**4,56**
10	0,125	1	1,664	1,664	1,497	1,51	**7,45**
15	0,145	1	2,009	2,009	1,808	1,83	**9,06**
30	0,208	1	3,095	3,095	2,785	2,83	**13,99**
60	0,276	1	4,267	4,267	3,841	3,92	**19,36**
120	0,375	1	5,974	5,974	5,377	5,50	**27,16**
180	0,475	1	7,698	7,698	6,928	7,11	**35,12**
240	0,545	1	8,905	8,905	8,015	8,27	**40,87**
300	0,591	1	9,698	9,698	8,728	9,07	**44,84**
360	0,646	1	10,647	10,647	9,528	10,03	**49,53**

Replikasi 2

Menit	Abs	Fp	Kadar sampel	Kadar (ppm)	Jumlah (mg)	Terdisolusi (mg)	% Disolusi
0	0	0	0	0	0	0	**0**
5	0,105	1	1,319	1,319	1,187	1,19	**5,94**
10	0,201	1	2,974	2,974	2,677	2,69	**13,45**
15	0,208	1	3,095	3,095	2,785	2,83	**14,14**
30	0,255	1	3,905	3,905	3,515	3,59	**17,94**
60	0,321	1	5,043	5,043	4,539	4,65	**23,26**
120	0,389	1	6,216	6,216	5,594	5,76	**28,79**
180	0,447	1	7,216	7,216	6,494	6,72	**33,60**
240	0,494	1	8,026	8,026	7,223	7,52	**37,60**
300	0,546	1	8,922	8,922	8,030	8,41	**42,40**
360	0,610	1	10,026	10,026	9,023	9,49	**47,45**

Replikasi 3

Menit	Abs	Fp	Kadar sampel	Kadar (ppm)	Jumlah (mg)	Terdisolusi (mg)	% Disolusi
0	0	0	0	0	0	0	**0**
5	0,082	1	0,922	0,922	0,830	0,83	**4,15**
10	0,144	1	1,991	1,991	1,792	1,80	**9,01**
15	0,157	1	2,216	2,216	1,994	2,02	**10,12**
30	0,215	1	3,216	3,216	2,894	2,95	**14,73**
60	0,279	1	4,319	4,319	3,887	3,97	**19,85**
120	0,303	1	4,733	4,733	4,259	4,39	**21,93**
180	0,450	1	7,267	7,267	6,541	6,71	**33,57**
240	0,490	1	7,948	7,948	7,153	7,40	**37,00**
300	0,596	1	9,784	9,784	8,806	9,13	**45,66**
360	0,606	1	9,948	9,948	8,953	9,38	**46,89**

- Hasil uji disolusi tablet mukoadhesif nifedipin F2 (72:25)

Replikasi 1

Menit	Abs	Fp	Kadar sampel	Kadar (ppm)	Jumlah (mg)	Terdisolusi (mg)	% Disolusi
0	0	0	0	0	0	0	**0**
5	0,089	1	1,043	1,043	0,830	0,83	**4,15**
10	0,126	1	1,681	1,681	1,792	1,80	**9,01**
15	0,150	1	2,095	2,095	1,994	2,02	**10,12**
30	0,238	1	3,612	3,612	2,894	2,95	**14,73**
60	0,309	1	4,836	4,836	3,887	3,97	**19,85**
120	0,417	1	6,698	6,698	4,259	4,39	**21,93**
180	0,512	1	8,336	8,336	6,541	6,71	**33,57**
240	0,577	1	9,457	9,457	7,153	7,40	**37,00**
300	0,616	1	10,129	10,129	8,806	9,13	**45,66**
360	0,606	1	10,940	10,940	8,953	9,38	**46,89**

Replikasi 2

Menit	Abs	Fp	Kadar sampel	Kadar (ppm)	Jumlah (mg)	Terdisolusi (mg)	% Disolusi
0	0	0	0	0	0	0	**0**
5	0,088	1	1,026	1,026	0,923	0,920	**4,62**
10	0,119	1	1,560	1,560	1,404	1,410	**7,07**
15	0,135	1	1,836	1,836	1,653	1,680	**8,39**
30	0,178	1	2,578	2,578	2,320	2,360	**11,82**
60	0,243	1	3,698	3,698	3,328	3,400	**16,99**
120	0,334	1	5,267	5,267	4,471	4,850	**24,24**
180	0,438	1	7,060	7,060	6,354	6,510	**32,57**
240	0,513	1	8,353	8,353	7,518	7,750	**38,74**
300	0,566	1	9,267	9,267	8,341	8,650	**43,27**
360	0,630	1	10,371	10,371	9,334	9,740	**48,70**

Replikasi 3

Menit	Abs	Fp	Kadar sampel	Kadar (ppm)	Jumlah (mg)	Terdisolusi (mg)	% Disolusi
0	0	0	0	0	0	0	**0**
5	0,088	1	1,026	1,026	0,923	0,920	**4,56**
10	0,125	1	1,664	1,664	1,497	1,510	**7,45**
15	0,145	1	2,009	2,009	1,808	1,830	**9,06**
30	0,208	1	3,095	3,095	2,785	2,830	**13,99**
60	0,276	1	4,267	4,267	3,841	3,920	**19,36**
120	0,375	1	5,974	5,974	5,377	5,500	**27,16**
180	0,475	1	7,698	7,698	6,928	7,110	**35,12**
240	0,545	1	8,905	8,905	8,015	8,270	**40,87**
300	0,591	1	9,698	9,698	8,728	9,070	**44,84**
360	0,646	1	10,647	10,647	9,582	10,030	**49,53**

- Hasil uji disolusi tablet mukoadhesif nifedipin F3 (50:50)

Replikasi 1

Menit	Abs	Fp	Kadar sampel	Kadar (ppm)	Jumlah (mg)	Terdisolusi (mg)	% Disolusi
0	0	0	0	0	0	0	**0**
5	0,058	1	0,509	0,509	0,458	0,460	**2,29**
10	0,086	1	0,991	0,991	0,892	0,900	**4,49**
15	0,094	1	1,129	1,129	1,016	1,030	**5,16**
30	0,125	1	1,664	1,664	1,497	1,520	**7,62**
60	0,172	1	2,474	2,474	2,227	2,270	**11,35**
120	0,238	1	3,612	3,612	3,612	3,320	**16,59**
180	0,284	1	4,405	4,405	3,965	4,070	**20,34**
240	0,324	1	5,095	5,095	4,585	4,730	**23,67**
300	0,358	1	5,681	5,681	5,113	5,310	**26,56**
360	0,393	1	6,284	6,284	5,65	5,910	**29,56**

Replikasi 2

Menit	Abs	Fp	Kadar sampel	Kadar (ppm)	Jumlah (mg)	Terdisolusi (mg)	% Disolusi
0	0	0	0	0	0	0	**0**
5	0,074	1	0,784	0,784	0,706	0,71	**3,53**
10	0,106	1	1,336	1,336	1,203	1,21	**6,05**
15	0,149	1	2,078	2,078	1,870	1,89	**9,46**
30	0,196	1	2,888	2,888	2,599	2,64	**13,21**
60	0,286	1	4,440	4,440	3,996	4,07	**20,33**
120	0,382	1	6,095	6,095	5,485	5,60	**28,00**
180	0,454	1	7,336	7,336	6,603	6,78	**33,89**
240	0,508	1	8,267	8,267	7,441	7,69	**38,45**
300	0,566	1	9,267	9,267	8,341	8,67	**43,36**
360	0,613	1	10,078	10,078	9,070	9,49	**47,47**

Replikasi 3

Menit	Abs	Fp	Kadar sampel	Kadar (ppm)	Jumlah (mg)	Terdisolusi (mg)	% Disolusi
0	0	0	0	0	0	0	0
5	0,066	1	0,647	0,647	0,582	0,58	2,91
10	0,096	1	1,164	1,164	1,047	1,05	5,27
15	0,122	1	1,603	1,603	1,443	1,46	7,31
30	0,161	1	2,227	2,227	2,048	2,08	10,41
60	0,231	1	3,483	3,483	3,134	3,19	15,96
120	0,310	1	4,853	4,853	4,368	4,46	22,30
180	0,369	1	5,871	5,871	5,284	5,42	27,12
240	0,416	1	6,681	6,681	6,013	6,21	31,06
300	0,462	1	7,474	7,474	6,727	6,99	34,96
360	0,503	1	8,181	8,181	7,363	7,70	38,52

- Hasil uji disolusi tablet mukoadhesif nifedipin (25:75)

Replikasi 1

Menit	Abs	Fp	Kadar sampel	Kadar (ppm)	Jumlah (mg)	Terdisolusi (mg)	% Disolusi
0	0	0	0	0	0	0	**0**
5	0,088	1	1,026	1,060	0,954	0,95	**4,77**
10	0,123	1	1,621	1,664	1,497	1,51	**7,54**
15	0,143	1	1,966	2,284	2,056	2,08	**10,42**
30	0,208	1	3,095	3,560	3,204	3,25	**16,27**
60	0,276	1	4,267	4,399	4,399	4,48	**22,42**
120	0,376	1	5,983	5,983	6,013	6,15	**30,74**
180	0,476	1	7,698	7,698	7,409	7,61	**38,05**
240	0,5454	1	8,905	8,905	8,325	8,61	**43,04**
300	0,591	1	9,698	9,698	9,520	9,90	**49,48**
360	0,647	1	10,655	10,655	10,094	10,58	**52,88**

Replikasi 2

Menit	Abs	Fp	Kadar sampel	Kadar (ppm)	Jumlah (mg)	Terdisolusi (mg)	% Disolusi
0	0	0	0	0	0	0	**0**
5	0,126	1	1,681	1,681	1,513	1,51	**7,56**
10	0,171	1	2,457	2,457	2,211	2,23	**11,14**
15	0,228	1	3,440	3,440	3,096	3,14	**15,69**
30	0,291	1	4,526	4,526	4,526	4,15	**20,75**
60	0,371	1	5,905	5,905	5,315	5,44	**27,18**
120	0,489	1	7,940	7,940	7,146	7,33	**36,63**
180	0,577	1	9,457	9,457	8,511	8,77	**43,85**
240	0,634	1	10,440	10,440	9,395	9,75	**48,75**
300	0,671	1	11,078	11,078	9,970	10,43	**52,14**
360	0,680	1	11,233	11,233	10,109	10,68	**53,39**

Replikasi 3

Menit	Abs	Fp	Kadar sampel	Kadar (ppm)	Jumlah (mg)	Terdisolusi (mg)	% Disolusi
0	0	0	0	0	0	0	**0**
5	0,108	1	1,371	1,371	1,234	1,23	**6,17**
10	0,148	1	2,060	2,060	1,854	1,87	**9,34**
15	0,195	1	2,862	2,862	2,576	2,61	**13,05**
30	0,263	1	4,043	4,043	3,639	3,70	**18,51**
60	0,315	1	4,931	4,931	4,438	4,54	**22,71**
120	0,453	1	7,310	7,310	6,579	6,73	**33,66**
180	0,542	1	8,845	8,845	7,960	8,19	**40,93**
240	0,600	1	9,845	9,845	8,860	9,17	**45,87**
300	0,657	1	10,828	10,828	9,745	10,16	**50,79**
360	0,680	1	11,224	11,224	10,102	10,62	**53,11**

- Hasil uji tablet mukoadhesif nifedipin F5 (0:100)

Replikasi 1

Menit	Abs	Fp	Kadar sampel	Kadar (ppm)	Jumlah (mg)	Terdisolusi (mg)	% Disolusi
0	0	0	0	0	0	0	**0**
5	0,125	1	1,664	1,664	1,497	1,50	**7,49**
10	0,146	1	2,026	2,026	1,823	1,84	**9,20**
15	0,180	1	2,612	2,612	2,351	2,39	**11,94**
30	0,239	1	3,629	3,629	3,266	3,33	**16,65**
60	0,289	1	4,491	4,491	4,042	4,14	**20,71**
120	0,341	1	5,388	5,388	4,849	4,99	**24,97**
180	0,387	1	6,181	6,181	5,563	5,76	**28,81**
240	0,415	1	6,664	6,664	5,997	6,26	**31,29**
300	0,445	1	7,181	7,181	6463	6,79	**33,95**
360	0,476	1	7,716	7,716	6,944	7,34	**36,71**

Replikasi 2

Menit	Abs	Fp	Kadar sampel	Kadar (ppm)	Jumlah (mg)	Terdisolusi (mg)	% Disolusi
0	0	0	0	0	0	0	**0**
5	0,115	1	1,491	1,491	1,342	1,34	**6,71**
10	0,165	1	2,353	2,353	2,118	2,13	**10,67**
15	0,188	1	2,750	2,750	2,475	2,51	**12,57**
30	0,215	1	3,216	3,216	2,894	2,96	**14,80**
60	0,263	1	4,043	4,043	3,639	3,74	**18,68**
120	0,355	1	5,629	5,629	5,066	5,20	**26,02**
180	0,409	1	6,560	6,560	5,904	6,10	**30,50**
240	0,458	1	7,405	7,405	6,665	6,93	**34,63**
300	0,489	1	7,940	7,940	7,146	7,48	**37,40**
360	0,520	1	8,474	8,474	7,627	8,04	**40,20**

Replikasi 3

Menit	Abs	Fp	Kadar sampel	Kadar (ppm)	Jumlah (mg)	Terdisolusi (mg)	% Disolusi
0	0	0	0	0	0	0	**0**
5	0,140	1	1,922	1,922	1,730	1,73	**8,65**
10	0,156	1	2,190	2,190	1,971	1,99	**9,95**
15	0,184	1	2,681	2,681	2,413	2,45	**12,27**
30	0,227	1	3,422	3,422	3,080	3,15	**15,74**
60	0,276	1	4,267	4,267	3,841	3,94	**19,71**
120	0,348	1	5,509	5,509	4,958	5,10	**25,51**
180	0,398	1	6,371	6,371	5,734	5,93	**29,67**
240	0,437	1	7,034	7,034	6,331	6,59	**32,97**
300	0,467	1	7,560	7,560	6,804	7,14	**35,69**
360	0,498	1	8,095	8,095	7,285	7,69	**38,47**

Menit	Persen terdisolusi (%)								
	F1			F2			F3		
	rep 1	rep 2	rep 3	rep 1	rep 2	rep 3	rep 1	rep 2	rep 3
0	0	0	0	0	0	0	0	0	0
5	2,37	5,94	4,15	4,69	4,62	4,56	2,29	3,53	2,91
10	4,57	13,45	9,01	7,62	7,07	7,45	4,49	6,05	5,27
15	6,09	14,14	10,12	9,56	8,39	9,06	5,16	9,46	7,31
30	11,51	17,94	14,73	16,50	11,82	13,99	7,62	13,21	10,41
60	16,45	23,26	19,85	22,18	16,99	19,36	11,35	20,33	15,96
120	24,38	28,79	26,59	30,81	24,24	27,16	16,59	28,00	22,30
180	31,32	33,60	33,62	38,51	32,57	35,12	20,34	33,89	27,12
240	36,47	37,60	37,01	43,97	38,74	40,87	23,67	38,45	31,06
300	41,40	42,40	45,71	47,47	43,27	44,84	26,56	43,36	34,96
360	46,31	47,45	46,90	51,62	48,70	49,53	29,56	47,47	38,52

Menit	% Terdisolusi					
	F4			F5		
	rep 1	rep 2	rep 3	rep 1	rep 2	rep 3
0	0	0	0	0	0	0
5	4,77	7,56	6,17	7,49	6,71	8,65
10	7,54	11,14	9,34	9,20	10,67	9,95
15	10,42	15,69	13,05	11,94	12,57	12,27
30	16,27	20,75	18,51	16,65	14,80	15,74
60	22,42	27,18	22,71	20,71	18,68	19,71
120	30,74	36,63	33,66	24,97	26,02	25,51
180	38,05	43,85	40,93	28,81	30,50	29,67
240	43,04	48,75	45,87	31,29	34,63	32,97
300	49,48	52,14	50,79	33,95	37,40	35,69
360	52,88	53,39	53,11	36,71	40,20	38,47

- **Rata-rata terdisolusi**

Menit	Rata-rata % terdisolusi (%)				Simpangan baku (%)			
	F1	F2	F3	F4	F1	F2	F3	F4
0	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00
5	4,15	4,62	2,91	6,71	1,78	0,07	0,62	1,40
10	9,01	7,38	5,27	9,34	4,44	0,28	0,78	1,80
15	10,12	9,01	7,31	13,05	4,03	0,59	2,15	2,63
30	14,73	14,01	10,41	18,51	3,22	2,34	2,79	2,24
60	19,85	19,51	15,88	24,10	3,41	2,60	4,49	2,67
120	26,59	27,40	22,30	33,68	2,20	2,20	5,71	2,95
180	32,85	35,40	27,12	40,95	1,32	3,29	6,78	2,90
240	37,03	41,19	31,06	45,89	0,57	2,98	7,39	2,85
300	43,12	45,19	34,96	50,80	2,26	2,12	8,40	1,33
360	46,89	49,95	38,52	53,13	0,57	1,51	8,96	0,26

Menit	Rata-rata baku	simpangan
		F5
0	0	0
15	7,62	0,98
30	9,94	0,73
45	12,26	0,31
60	15,73	0,92
90	19,70	1,01
120	25,20	0,53
180	29,66	0,85
240	32,96	1,67
300	35,68	1,73
360	38,46	1,75

- **Hasil perhitungan AUC untuk tablet mukoadhesif nifedipin ke lima formula**

Menit	*Area Under Curve* (AUC) (% menit)					
	F1			F2		
	rep 1	rep 2	rep 3	rep 1	rep 2	rep 3
5	5,92	14,84	10,38	11,73	11,40	11,54
10	17,33	48,46	32,90	30,78	30,03	29,22
15	26,64	68,98	47,81	42,28	41,28	38,66
30	132,00	240,63	558	195,82	172,94	151,59
60	419,35	618,02	696,58	580,20	500,30	432,19
120	1224,94	1561,36	1806,30	1589,70	1395,62	1236,89
180	1671,25	1871,52	2119,13	2079,50	1868,50	1704,22
240	2033,91	2136,06	2481,76	2474,47	2279,76	2139,35
300	2342,21	2389,36	2743,23	2743,23	2571,17	2460,40
360	2637,40	2684,78	2972,78	2972,78	2831,04	2759,16
AUC total	105510,94	11634,01	12720,78	12720,78	11702,04	10963,23
Luas total	36000	36000,00	36000	36000	36000	36000
DE_{360}	29,20	32,32	30,70	35,34	32,51	30,45

Menit	*Area Under Curve* (AUC) (% menit)					
	F3			F4		
	rep 1	rep 2	rep 3	rep 1	rep 2	rep 3
5	5,72	8,83	7,27	11,93	18,91	15,42
10	16,94	23,96	20,45	30,78	46,76	38,77
15	24,11	38,77	31,44	44,89	67,06	55,98
30	95,82	169,96	132,89	200,16	273,23	236,70
60	284,50	503,08	395,53	580,44	718,86	618,23
120	838,23	1450,07	1147,68	1594,85	1914,22	1690,99
180	1108,05	1856,91	1482,56	2063,75	2414,47	2237,72
240	1320,25	2170,33	1745,37	2432,94	2778,06	2604,10
300	1506,74	2454,43	1980,66	2775,71	3026,70	2899,81
360	1683,85	2725,13	2204,39	3070,80	3166,05	3117,03
AUC total	6883,85	11401,45	9148,23	12806,25	14424,33	13514,74
Luas total	36000	36000	36000	36000	36000	36000
DE_{360}	19,12	31,67	25,41	35,57	40,07	37,54

Menit	*Area Under Curve* (AUC) (% menit)		
	F5		
	rep 1	rep 2	rep 3
5	18,72	16,78	21,63
10	41,72	43,44	46,50
15	52,85	58,08	55,55
30	214,39	205,25	210,08
60	560,32	502,26	513,81
120	1370,24	1341,27	1356,79
180	1613,16	1695,61	1655,42
240	1802,75	1953,63	1879,23
300	1957,02	2160,79	2059,94
360	2119,77	2328,12	2224,98
AUC total	9750,94	10305,23	10041,92
Luas total	36000	36000	36000
DE_{360}	27,09	28,63	27,89

Rata-rata *Disollution efficiency(%)*

Replikasi	*Dissolution Efficiency* (%)				
	F1	F2	F3	F4	F5
1	29,20	35,34	19,12	35,57	27,09
2	32,32	32,51	31,67	40,07	28,63
3	30,70	30,45	25,41	37,05	27,89
rata-rata	30,74	32,77	25,40	37,56	27,87
SD	1,56	2,46	6,28	2,29	0,77

Lampiran 5. Kinetika dan Mekanisme pelepasan obat

Kinetika dan mekanisme pelepasan tablet sustained relase nifedipin mukoadhesif. Nilai koefisen korelasi (r) dengan plot orde nol (t-%W), orde satu (t-In(100-%W)) dan model Higuchi(√t-%W).

Formula 1

Waktu	Akar t	Log t	% W	In %w	Log F
5	2,236	0,699	4,151	1,423	-1,382
10	3,162	1,000	9,007	2,198	-1,045
15	3,873	1,176	10,116	2,314	-0,995
30	5,477	1,477	14,726	2,690	-0,832
60	7,746	1,778	19,853	2,988	-0,702
120	10,954	2,079	26,586	3,280	-0,575
180	13,416	2,255	32,848	3,492	-0,483
240	15,492	2,380	37,031	3,612	-0,431
300	17,321	2,477	43,118	3,764	-0,365
360	18,974	2,556	46,888	3,848	-0,329

Orde nol dengan persamaan:

a = 9,533971

b = 0,113

r = 0,979

diperoleh dengan persamaan :

y = a + bx

y = 9,533971 + 0,113 x

Orde satu dengan persamaan :

a = 2,2617872

b = 0,113

r = 0,874

diperoleh dengan persamaan :

y = a + bx

y = 2,2617872 + 0,113x

Model higuchi dengan persamaan

a = 0,446487

b = 2,431

r = 0,998

diperoleh dengan persamaan :

y = a + bx

y = 0,446487 + 2,431x

Formula 2

Waktu	Akar t	Log t	% W	In %w	Log F
5	2,236	0,699	4,624	1,531	-1,335
10	3,162	1,000	7,380	1,999	-1,132
15	3,873	1,176	9,007	2,198	-1,045
30	5,477	1,477	14,103	2,646	-0,851
60	7,746	1,778	19,512	2,971	-0,710
120	10,954	2,079	27,401	3,311	-0,562
180	13,416	2,255	35,401	3,567	-0,451
240	15,492	2,380	41,194	3,718	-0,385
300	17,321	2,477	45,192	3,811	-0,345
360	18,974	2,556	49,952	3,911	-0,301

Orde nol dengan persamaan:

a = 8,79997

b = 0,1256

r = 0,9807

diperoleh dengan persamaan :

y = a + bx

y = 8,79997 + 0,1256 x

Orde satu dengan persamaan :

a = 2,21013

b = 0,1256

r = 0,8947

diperoleh dengan persamaan :

y = a + bx

y = 2,21013 + 0,1256x

Model higuchi dengan persamaan :

a = -1,28769

b = 2,7029

r = 0,9996

diperoleh dengan persamaan :

y = a + bx

y = -1,28769 + 2,7029x

Formula 3

Waktu	Akar t	Log t	% W	In %w	Log F
5	2,236	0,699	2,909	1,068	-1,536
10	3,162	1,000	5,269	1,662	-1,278
15	3,873	1,176	7,306	1,989	-1,136
30	5,477	1,477	10,412	2,343	-0,982
60	7,746	1,778	15,879	2,765	-0,799
120	10,954	2,079	22,298	3,105	-0,652
180	13,416	2,255	27,119	3,300	-0,567
240	15,492	2,380	31,059	3,436	-0,508
300	17,321	2,477	34,962	3,554	-0,456
360	18,974	2,556	38,516	3,651	-0,414

Orde nol dengan persamaan:

a = 6,791135

b = 0,097

r = 0,976

diperoleh dengan persamaan :

y = a + bx

y = 6,791135 + 0,097 x

Orde satu dengan persamaan :

a = 1,908054

b = 0,097

r = 0,873

diperoleh dengan persamaan :

y = a + bx

y = 1,908054 + 0,097x

Model higuchi dengan persamaan :

a = -1,08534

b = 2,094

r = 0,999

diperoleh dengan persamaan :

y = a + bx

y = -1,08534 + 2,094x

Formula 4

Waktu	Akar t	Log t	% W	In %w	Log F
5	2,236	0,699	6,168	1,819	-1,210
10	3,162	1,000	9,340	2,234	-1,030
15	3,873	1,176	13,051	2,569	-0,884
30	5,477	1,477	18,509	2,918	-0,733
60	7,746	1,778	24,103	2,182	-0,618
120	10,954	2,079	33,675	3,517	-0,473
180	13,416	2,255	40,946	3,712	-0,388
240	15,492	2,380	45,888	3,826	-0,338
300	17,321	2,477	50,803	3,928	-0,294
360	18,974	2,556	53,129	3,973	-0,275

Orde nol dengan persamaan:

a = 12,40709

b = 0,130

r = 0,966

diperoleh dengan persamaan :

y = a + bx

y = 12,40709 + 0,130

Orde satu dengan persamaan :

a = 2,49864

b = 0,130

r = 0,875

diperoleh dengan persamaan :

y = a + bx

y = 2,49864 + 0,130x

Model higuchi dengan persamaan :

a = 1,602841

b = 2,834

r = 0,997

diperoleh dengan persamaan :

y = a + bx

y = 1,602841 + 2,834x

Formula 5

Waktu	Akar t	Log t	% W	In %w	Log F
5	2,236	0,699	5,060	1,621	-1,296
10	3,162	1,000	7,480	2,012	-1,126
15	3,873	1,176	8,880	2,184	-1,052
30	5,477	1,477	13,730	2,620	-0,862
60	7,746	1,778	19,180	2,954	-0,717
120	10,954	2,079	25,260	3,299	-0,598
180	13,416	2,255	29,700	3,391	-0,527
240	15,492	2,380	33,970	3,525	-0,469
300	17,321	2,477	37,000	3,611	-0,432
360	18,974	2,556	41,200	3,718	-0,385

Orde nol dengan persamaan:

a = 9,318001

b = 0,097

r = 0,970

diperoleh dengan persamaan :

y = a + bx

y = 9,318001 + 0,097 x

Orde satu dengan persamaan :

a = 2,227137

b = 0,097

r = 0,885

diperoleh dengan persamaan :

y = a + bx

y = 2,227137 + 0,097x

Model higuchi dengan persamaan :

a = 1,311119

b = 2,112

r = 0,998

diperoleh dengan persamaan :

y = a + bx

y = 1,311119 + 2,112x

Lampiran 6. Uji sifat fisik granul formula optimum tablet sustained relase nifedipin mukoadhesif.

- Uji waktu alir granul formula optimum

Replikasi	Waktu alir (detik)
1	9,50
2	8,55
3	9,50
Rata-rata	9,183
SD	0,548

Lampiran 7. Uji sifat fisik tablet formula optimum tablet sustained release nifedipin mukoadhesif

- Uji kekerasan tablet

replikasi	Kekerasan (kg)
1	13,4
2	13,4
3	12,9
Rata-rata	13,23
SD	0,554

- Uji mukoadhesif

Replikasi	mukoadhesif (detik)
1	10,12
2	9,32
3	9,45
Rata-rata	9,63
SD	0,429

- **Uji disolusi formula optimum**

Replikasi 1

Menit	Abs	Fp	Kadar sampel	Kadar (ppm)	Jumlah (mg)	Terdisolusi (mg)	% Disolusi
0	0	0	0	0	0	0	**0**
5	0,172	1	2,474	2,474	2,227	2,23	**11,13**
10	0,215	1	3,216	3,216	2,894	2,92	**14,59**
15	0,221	1	3,319	3,319	2,987	3,04	**15,22**
30	0,240	1	3,647	3,647	3,282	3,37	**16,86**
60	0,280	1	4,336	4,336	3,903	4,03	**20,51**
120	0,358	1	5,681	5,681	5,113	5,28	**26,41**
180	0,445	1	7,181	7,181	6,463	6,69	**33,45**
240	0,513	1	8,353	8,353	7,518	7,82	**39,08**
300	0,581	1	9,526	9,526	8,573	8,96	**44,78**
360	0,632	1	10,405	10,405	9,365	9,84	**49,21**

Replikasi 2

Menit	Abs	Fp	Kadar sampel	Kadar (ppm)	Jumlah (mg)	Terdisolusi (mg)	% Disolusi
0	0	0	0	0	0	0	**0**
5	0,207	1	3,078	3,078	2,770	2,77	**13,85**
10	0,217	1	3,250	3,250	2,925	2,96	**14,78**
15	0,236	1	3,578	3,578	3,220	3,28	**16,42**
30	0,248	1	3,784	3,784	3,406	3,51	**17,53**
60	0,281	1	4,353	4,353	3,918	4,06	**20,28**
120	0,370	1	5,888	5,888	5,299	5,48	**27,40**
180	0,449	1	7,250	7,250	6,525	6,76	**33,82**
240	0,542	1	8,853	8,853	7,968	8,28	**41,40**
300	0,594	1	9,750	9,750	8,775	9,18	**45,88**
360	0,649	1	10,698	10,698	9,628	10,13	**50,3**

Replikasi 3

Menit	Abs	Fp	Kadar sampel	Kadar (ppm)	Jumlah (mg)	Terdisolusi (mg)	% Disolusi
0	0	0	0	0	0	0	**0**
5	0,189	1	2,767	2,767	2,491	2,49	**12,45**
10	0,216	1	3,233	3,233	2,909	2,94	**14,69**
15	0,228	1	3,440	3,440	3,096	3,16	**15,78**
30	0,244	1	3,716	3,716	3,344	3,44	**17,19**
60	0,280	1	4,336	4,336	3,903	4,03	**20,17**
120	0,374	1	5,957	5,957	5,361	5,54	**27,68**
180	0,447	1	7,216	7,216	6,494	6,73	**33,64**
240	0,537	1	8,767	8,767	7,891	8,20	**40,99**
300	0,587	1	9,629	9,629	8,666	9,06	**45,30**
360	0,652	1	10,750	10,750	9,675	10,17	**50,83**

- ***Dissolution Efficiency***

Replikasi	DE_{360} (%)
1	32,407
2	33,452
3	33,249
Rata-rata	33,036
SD	0,554

Lampiran 8. Hasil SPSS uji waktu alir pada formula optimum

- Uji waktu alir dengan ***Kolmogorov-Smirnov***

Descriptive Statistics

	N	Mean	Std. Deviation	Minimum	Maximum
WA	3	9.4667	.05774	9.40	9.50

One-Sample Kolmogorov-Smirnov Test

		WA
N		3
Normal Parameters[a,,b]	Mean	9.4667
	Std. Deviation	.05774
Most Extreme Differences	Absolute	.385
	Positive	.282
	Negative	-.385
Kolmogorov-Smirnov Z		.667
Asymp. Sig. (2-tailed)		.766

a. Test distribution is Normal.

b. Calculated from data.

- Hasil uji waktu alir dengan ***one sampel t-test***

One-Sample Statistics

	N	Mean	Std. Deviation	Std. Error Mean
WA	3	9.4667	.05774	.03333

Descriptive Statistics

	N	Mean	Std. Deviation	Minimum	Maximum
kekerasan	3	13.2333	.28868	12.90	13.40

One-Sample Test

	Test Value = 9.49					
					95% Confidence Interval of the Difference	
	T	Df	Sig. (2-tailed)	Mean Difference	Lower	Upper
WA	-.700	2	.556	-.02333	-.1668	.1201

- Hasil uji kekerasan dengan ***Kolmogorov-Smirnov***

One-Sample Kolmogorov-Smirnov Test

		kekerasan
N		3
Normal Parameters[a,,b]	Mean	13.2333
	Std. Deviation	.28868
Most Extreme Differences	Absolute	.385
	Positive	.282
	Negative	-.385
Kolmogorov-Smirnov Z		.667
Asymp. Sig. (2-tailed)		.766

a. Test distribution is Normal.

b. Calculated from data.

- Hasil uji kekerasan dengan ***one sampel t-test***

Descriptive Statistics

	N	Mean	Std. Deviation	Minimum	Maximum
mukoahdesif	3	9.9633	.58106	9.32	10.45

One-Sample Statistics

	N	Mean	Std. Deviation	Std. Error Mean
kekerasan	3	13.2333	.28868	.16667

One-Sample Test

	Test Value = 13.297					
					95% Confidence Interval of the Difference	
	T	Df	Sig. (2-tailed)	Mean Difference	Lower	Upper
kekerasan	-.382	2	.739	-.06367	-.7808	.6534

- Hasil uji mukoadhesif dengan ***Kolmogorov-smirnov***

One-Sample Kolmogorov-Smirnov Test

		mukoahdesif
N		3
Normal Parameters[a,,b]	Mean	9.9633
	Std. Deviation	.58106
Most Extreme Differences	Absolute	.273
	Positive	.201
	Negative	-.273
Kolmogorov-Smirnov Z		.473
Asymp. Sig. (2-tailed)		.979

a. Test distribution is Normal.

b. Calculated from data.

- Hasil uji mukoadhesif dengan ***one sampel t-test***

One-Sample Statistics

	N	Mean	Std. Deviation	Std. Error Mean
mukoahdesif	3	9.9633	.58106	.33548

One-Sample Test

	Test Value = 10.771					
					95% Confidence Interval of the Difference	
	T	df	Sig. (2-tailed)	Mean Difference	Lower	Upper
mukoahdesif	-2.408	2	.138	-.80767	-2.2511	.6358

- Hasil uji DE dengan ***Kolmogorov-Smirnov***

Descriptive Statistics

	N	Mean	Std. Deviation	Minimum	Maximum
DE360	3	33.0353	.55336	32.41	33.45

One-Sample Kolmogorov-Smirnov Test

		DE360
N		3
Normal Parameters[a,,b]	Mean	33.0353
	Std. Deviation	.55336
Most Extreme Differences	Absolute	.317
	Positive	.227
	Negative	-.317
Kolmogorov-Smirnov Z		.549
Asymp. Sig. (2-tailed)		.924

a. Test distribution is Normal.

One-Sample Kolmogorov-Smirnov Test

		DE360
N		3
Normal Parameters[a.,b]	Mean	33.0353
	Std. Deviation	.55336
Most Extreme Differences	Absolute	.317
	Positive	.227
	Negative	-.317
Kolmogorov-Smirnov Z		.549
Asymp. Sig. (2-tailed)		.924

a. Test distribution is Normal.

b. Calculated from data.

- Hasil uji DE dengan ***one sampel t-test***

One-Sample Statistics

	N	Mean	Std. Deviation	Std. Error Mean
DE360	3	33.0353	.55336	.31948

One-Sample Test

	Test Value = 32.127					
					95% Confidence Interval of the Difference	
	T	df	Sig. (2-tailed)	Mean Difference	Lower	Upper
DE360	2.843	2	.105	.90833	-.4663	2.2829

Lampiran 9. ***Certificate of analysis nifedipin micronized***

Certificate of Analysis

Item Number	: C-30079-00		
Description	: NIFEDIPINE MICRONIZED	Manufacturing Date	: 27-AUG-13
Batch No.	: 400196067	Expired Date	: 26-AUG-18

NUMBER	CHARACTERISTIC	SPECIFICATION	ACTUAL RESULTS	MEASURE	PASS
10	Appearance	Yellow powder and it is affected by Exposure to light (as information)	Conform		Accept
20	Solubility	Practically insoluble in water, freely soluble in acetone	Conform		Accept
30	Infrared absorption Spectrophotometry	Positive	Positive		Accept
31	UV absorption Spectrophotometry	Positive	Positive		Accept
40	Loss on drying	<= 0.5 %	0.0	%	Accept
50	Heavy metals	<= 10 ppm (Method II)	< 10	ppm	Accept
60	Sulphated ash	<= 0.1 %	0.0	%	Accept
70	Melting range	171 deg C – 175 deg C	174	deg C	Accept
80	Limit of chloride	<= 0.02 %	< 0.02	%	Accept
90	Limit of sulfate	<= 0.05 %	< 0.05	%	Accept
100	Related Substances	Conform	Conform		Accept
110	Perchloric acid titration	<= 0.12 mL	0.08	mL	Accept
120	Assay	98.0 % - 102.0 % (Calculated on the dried basis)	101.0	%	Accept
130	Particle Size < 10 micron	(75 % - 95 %)	Conform		Accept
140	particle Size < 30 Micron	(98%)	Conform		Accept

13 August 2014

Effendi ,S.Si, Apt
Quality Manager

Lampiran 10. ***Certificate of HPMC K15M***

Pg. 1 of 1

Certificate 6392371 The Dow Chemical Company Page 1
Date: 05.12.2013 Certificate of Analysis Shipped: 05.12.2013
File Copy
DOW CHEMICAL PACIFIC LIMITED Fax: COA ARCHIVE
SHANGHAI PUDONG AIRPORT
SHANGHAI SG 201202 CHINA
Cust P.O.: 7000033349 101241581 X Dlvy Note: 72310223 20
Material: METHOCEL* K15M Premium
Hydroxypropyl Methylcellulose Spec: 00053984-S
Batch: 2F28012N04 Mfgd: 28.06.2013 Retest Date: 27.06.2018
Ship from: THE DOW CHEMICAL COMPANY BAY CITY MI UNITED STATES

It is hereby certified the material indicated above has been manufactured in accordance with the FDA cGMPs, Kosher guidelines, was inspected and tested in accordance with the conditions and the requirements of current USP, EP and JP for Hypromellose as well as the current specific purity criteria for the food additive Hydroxypropyl Methyl Cellulose (E464) and unless agreed otherwise conforms in all respects to the specification relevant thereto.

Feature	Units	Results 2F28012N04	Limits Minimum	Maximum	Method
Apparent Viscosity Brookfield 2% in water, @ 20degC	mPa.s	17,867	13,275	24,780	Current USP/EP/JP
Loss on Drying	%	3.3	----	5.0	Current USP/EP/JP
Residue on Ignition	%	0.5	----	1.5	Current USP/JP
Ash, Sulfated	%	0.5	----	1.5	Current EP
pH, 2% in Water	-	6.1	5.0	8.0	Current USP/EP/JP
Assay, Methoxyl	%	22.7	19.0	24.0	Current USP/EP/JP
Assay, Hydroxypropoxy	%	10.2	7.0	12.0	Current USP/EP/JP
Appearance Opalescence		Passes			Current EP
Appearance solution color		Passes			Current EP

This Batch, based on audit testing and process control, is certified to be NMT 20 ppm heavy metals (as Pb) and also meets all specification requirements for harmonized identification tests, residual solvents and microbiological limits.
Batch (Lot) Number manufacture location (char 7-8): 2N = Midland, MI; ND = Bomlitz,Germany; 24 = Plaquemine, LA; 07 = Stade, Germany

Julie Wright, FORTEFIBER, METHOCEL Quality Systems Specialist
For inquiries please contact Customer Service at 1-800-232-2436 (USA).

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