BAB V

KESIMPULAN

A. Kesimpulan

Hasil penelitian menunjukkan bahwa proporsi HPMC dan Na CMC berpengaruh terhadap mutu fisik granul, tablet dan pelepasan obat. Interaksi antara HPMC dan Na CMC meningkatkan waktu alir dan kerapuhan serta menurunkan pelepasan obat dan mengikuti pola pelepasan Higuchi. Data yang diperoleh diolah menggunakan *software Design Expert* versi 8.0.6.1 formula optimum mengandung 70% HPMC dan 30% Na CMC dengan tidak terdapat perbedaan bermakna antara data percobaan dengan prediksi.

B. Saran

1. Perlu dilakukan penelitian lebih lanjut tentang tablet lepas lambat kaptopril dengan menggunakan matriks lain.
2. Perlu dilakukan penelitian pembuatan tablet lepas lambat kaptopril dengan metode *factorial design*.

DAFTAR PUSTAKA

Anonim, 1979, *Farmakope Indonesia*, Edisi III, 7, 265, 338, 591, Departemen Kesehatan Republik Indonesia, Jakarta.

Ansel, Howard C, 1989, *Pengantar Bentuk Sediaan Farmasi*, 291,229, 259 272, 287 Universitas Indonesia Press, Jakarta.

Ballard BE, 1978 *An Overview of Prolonged Action Drug Dosage Forms. In Sustained and Controlled Release Drug Delivery Systems*, Marcel Dekker, Inc., New York,; pp 1-69

Banker. G. S., dan Rhoodes.C.T., 1996. Modern pharmaceutics, third cd..21-74. 590-592. Marcel Dekker, New York

Bolton, S.,1997, *Pharmaceutical statistic : Practical and Clinical Aplication*, 2nd ed marcell dekker Inc. New York

Collet, J., and Moreton, C.,2002. Modified-Released Peroral Dosage Form, dalam Aulton ,M.E.,*Pharmaceutics: The Science of Dosage Form Design*, Edisi II, Churcill Livingstone, Edinburg-London-New york-Philadhelpia St. Louis Sydney-Toronto

Costa, P., Lobo J.M.S., 2001, Modeling and comparison of dissolution profile, *Eur. J. Pharm. Sci*., 13(1) : 123-133

Fennema, O. R., M. Karen, and D. B. Lund. 1996. Principle of Food Science. The AVI Publishing, Connecticut Siswanto, A., dan Sri Sulihtyowati S., 2006, Optimasi formula sediaan tablet lepas lambat teofilin dengan bahan matrik HPMC, Na CMC, dan xanthan gum: *Majalah Farmasi Indonesia*, vol 3, No. 2, hal 143 – 148

Gibson, M., 2009, *Pharmaceutical Preformulation and Formulation, A Practical Guide from Candidate Drug Selection to Commercial Dosage Form*, 2nd Edition, Informa Healthcare USA, Inc., hal 371-373

Kadin, H., 1982, Captopril dalam Analytical Profiles of Drug Substances Volume 11.: Academic

Lachman L., Lieberman H.A., Kanig J.L., 1994, *Teori dan Praktek Farmasi Industri* diterjemahkan oleh Suyatni S., Edisi II, 660, 934-935, UI Press, Jakarta

Lee,V. H. L. and J. R. Robinson, 1978, *Sustained and Controlled Release Drug Delivery Systems*, Marcel Dekker, New York

Martin A, Swarbrick J, and Cammarata A. 1993. *Farmasi fisik: Dasar-Dasar Farmasi Fisik dalam Ilmu Farmasetika*, Ed ke-4 Diterjemahkan oleh Yoshita. Jakarta: UI Press. hlm 330 – 337

Martodihardjo, S., 1996, Pembuatan Sediaan Lepas Lambat Parasetamol Dengan Yogjakarta

Parrott, E. L., 1971, *Pharmaceutical Technology Fundamental Pharmaceuties*, 3rd Ed., 64-66, 73 83, Burgess Publising Company, Minnepolis. Press, New York, 80-131.

Rajabi-Siahboomi A., Levina M., 2004.The influence of excipients on drug release from hydroxypropyl mehylcellulose matrices. *J. Pharm. Sci*. 98:2746-2754.

Robinson, J.R. 1987. *Controlled Drug Delivery 2nd Edition*. Marcel Dekker Inc. New York and Basel. Hal : 376-377, 405-417

Rowe, *et.al*. 2006. *Handbook of Pharmaceutical Excipients Fifth Edition*. London: Royal Pharmaceutical Society of Great Britain.

Sari Nova Yaunar. 2009. Evaluasi Sifat Fisik Dan Pelepasan Natrium iklofenak Dalam Tablet Lepas Lambat Dengan Matriks Kombinasi Hidroksipropil Metilselulosa dan Metilselulosa. 18-19. Surakarta : Fakultas Farmasi, Universitas Muhammadiyah.

Seta, Yasuo, 1988, *Design and preparation of captopril sustained-release dosage forms and their biopharmaceutical properties*. Int. J. Pharmaceutics 41: 245-254.

Shargel, L, Andrew, B.C. and Yu. 1988. *Biofarmasetika dan Farmakokinetika* Terapan, Terjemahan : Fasich, Siti Syamsiah.Airlangga University Press.Surabaya. Hal : 445-479

Shargel, L., Susanna W, P., Andrew, B,C, 2005, *Applied Biopharmaceutics & Pharmacokinetics*,5th edition, McGraw Hill, Singapore.

Simon, B. H.,2001, *Tablet dan Kapsul Lepas Lambat (Sustained Release)*, Dexa Medika

Simon, B. H.,2001, *Tablet dan Kapsul Lepas Lambat (Sustained Release)*, Dexa Medika

Siregar, C. J. P., dan Wikarsa,S. 2010, *Taknologi Farmasi Sediaan Tablet Dasar-Dasar Praktis*, Cetakan 1, Jakarta

Siswanto, A., dan Sri Sulihtyowati S., 2006, Optimasi formula sediaan tablet lepas lambat teofilin dengan bahan matrik HPMC, Na CMC, dan xanthan gum: *Majalah Farmasi Indonesia*, vol 3, No. 2, hal 143 – 148

Sulaiman,T.N.S.,2007, Teknologi dan Formulasi Sediaan Tablet,Laboratorium Teknologi Farmasi Fakultas Farmasi Universitas Gadjah Mada, Yogyakarta

Tranggono, S., Haryadi, Suparmo, A. Murdiati, S. Sudarmadji, K. Rahayu, S. Naruki, dan M. Astuti. 1991. Bahan Tambahan Makanan (Food Additive). PAU Pangan dan Gizi UGM, Yogyakarta

Voigt, R. (1994). *Buku Pelajaran Teknologi Farmasi (Edisi V)*, diterjemahkan oleh Sundari Noerono. Yogyakarta : Gadjah Mada University Press

Voigt, R.,1984, *Buku Pelajaran Teknologi Farmasi*, diterjemahkan oleh Soewandhi, S.N., UGM Press, Yogyakarta.

L A M P I R A N

Lampiran 1. Sertifikat kaptopril

杭州华飞化工有限公司
AFINE CHEMICALS LIMITED

CERTIFICATE OF ANALYSIS

No: A3041-2013004

Product name	Captopril	According to	USP34
Source	Warehouse	Batch No.	A3041-1306-004
Package	Fibre drum	Manufacturing date	2013.06.21
Package size	25kg/drum	Report date	2013.06.22
Quantity	300kg	Retest date	2016.06.20

Items	**Specification**	**Results**
Description	White or off- white crystalline powder	White crystalline powder
Identification	IR Spectrum accordance with that of CRS	Complies
Specific rotation	−125° to−134°	−128.9°
Loss on drying	Not more than1.0%	0.08%
Residue on ignition	Not more than 0.2%	0.06%
Heavy metals	Not more than 0.003%	<0.003%
Related substances	Captopril disulfide: not more than 1.0%	0.20%
	Single impurity: not more than 0.2%	0.01%
	Total impurities: not more than 0.5%	0.14%
Organic volatile impurities	Meets the requirements	Complies
Assay (Anhydrous)	97.5% to 102.0%	99.5%
Conclusion: Complies with USP34		

QA manager: Zheng Bingpan

QC manager: Dong Weijie

Lampiran 2. Panjang gelombang maksimal

Data List (List Interval(nm):5.0)

ID	WL(nm)	ABS	ID	WL(nm)	ABS	ID	WL(nm)	ABS
1	300.0	0.012	2	295.0	0.012	3	290.0	0.013
4	285.0	0.015	5	280.0	0.019	6	275.0	0.021
7	270.0	0.022	8	265.0	0.022	9	260.0	0.022
10	255.0	0.022	11	250.0	0.023	12	245.0	0.026
13	240.0	0.031	14	235.0	0.045	15	230.0	0.084
16	225.0	0.176	17	220.0	0.285	18	215.0	0.441
19	210.0	0.634	20	205.0	0.811	21	200.0	0.838
22	195.0	0.287	23	190.0	0.203			

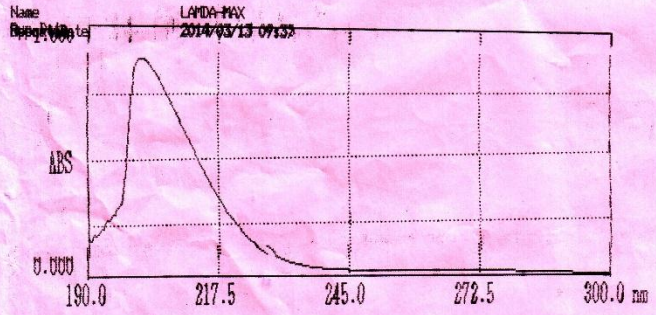
Model U-2900 Spectrophotometer

Serial No. 24E64-002

Program No. 2J15301-05

Name LAMDA-MAX

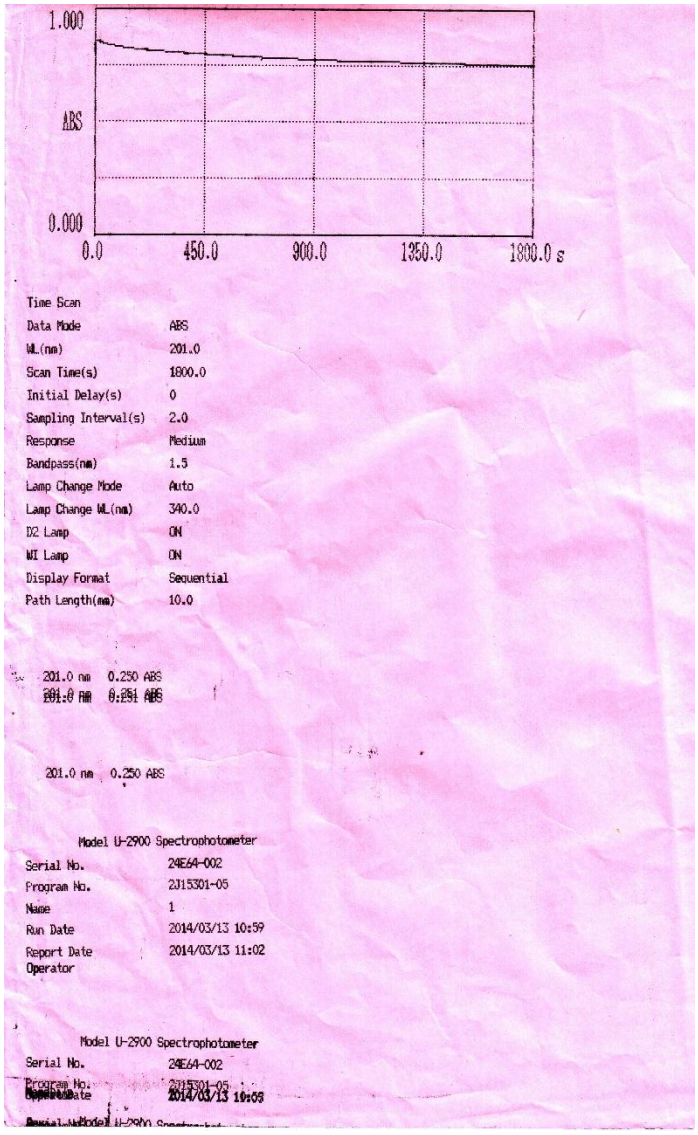
Date 2014/03/13 09:35



Peak (Threshold:0.001 Sensitivity:1)

ID	WL(nm)	ABS
1	201.4	0.884

Lampiran 3. Operating time



Time Scan

Data Mode	ABS
WL(nm)	201.0
Scan Time(s)	1800.0
Initial Delay(s)	0
Sampling Interval(s)	2.0
Response	Medium
Bandpass(nm)	1.5
Lamp Change Mode	Auto
Lamp Change WL(nm)	340.0
D2 Lamp	ON
WI Lamp	ON
Display Format	Sequential
Path Length(mm)	10.0

201.0 nm 0.250 ABS
201.0 nm 0.251 ABS
201.0 nm 0.251 ABS

201.0 nm 0.250 ABS

Model U-2900 Spectrophotometer

Serial No.	24E64-002
Program No.	2J15301-05
Name	1
Run Date	2014/03/13 10:59
Report Date	2014/03/13 11:02
Operator	

Model U-2900 Spectrophotometer

Serial No.	24E64-002
Program No.	2J15301-05
Report Date	2014/03/13 10:59

Lampiran 4. Waktu alir dan Sudut Diam

Pemeriksaan	Formula I	Formula II	Formula III	Formula IV	Formula V
Waktu alir (detik)	7,5	8	10,3	9,7	9,4
	7,5	8	10,2	9,4	9,1
	7,5	8	10,4	9,3	9,1
Rata-rata	7,5	8,00	10,3	9,5	9,20
SD	0,00	0,00	0,10	0,18	0,17

Sudut diam = antan $\frac{h}{r}$

Formula	d	h	r		sudut diam	Rata-rata	SD	CV
I	8.4	2.18	4.2	0.52	27.38	27.41	0.29	0.01
	8.3	2.18	4.15	0.53	27.71			
	8.39	2.15	4.2	0.51	27.14			
II	7.91	2.01	3.96	0.51	26.94	27.48	0.57	2.09
	7.59	2.03	3.8	0.53	28.08			
	7.91	2.05	3.95	0.52	27.41			
III	8.36	2.55	4.18	0.54	28.24	30.17	1.7	5.63
	8.28	2.53	4.14	0.61	31.44			
	8.27	2.47	4.13	0.6	30.82			
IV	8.25	2.3	4.12	0.56	29.1	28.74	0.33	1.13
	8.24	2.24	4.12	0.54	28.48			
	8.24	2.25	4.12	0.55	28.64			
V	7.21	1.94	3.61	0.54	28.22	28.34	0.9	3.19
	7.11	2	3.56	0.56	29.3			
	7.4	1.93	3.7	0.52	27.5			

Lampiran 5. Keseragaman bobot

	Formula I	Formula II	Formula III	Formula IV	Formula V
	299	297	300	298	300
	298	298	300	299	300
	300	298	299	299	301
	298	299	298	298	298
	300	300	301	299	302
	299	297	300	302	300
	299	300	302	301	297
	300	300	297	301	300
	300	301	299	302	299
	298	299	297	298	300
	299	300	297	299	299
	299	299	299	302	298
	302	298	299	298	300
	300	300	298	299	298
	299	299	299	300	300
	298	299	298	300	300
	300	299	299	301	299
	299	300	302	301	301
	299	299	298	300	297
	301	300	298	298	300
Rata-rata	299.35	299.1	299	299.75	299.45
SD	1.04	1.07	1.49	1.45	1.32
CV	0.35	0.36	0.50	0.48	0.44

Perhitungan penyimpangan bobot rata-rata menurut FI III :

- Range 7,5% Range 15%

FORMULA I

$\frac{7,5}{100}$ X 299,35	= 22,45	$\frac{15}{100}$ x 299,35	= 44, 90
299,35 + 22,45	= 321,80	299,35 + 44,90	= 344,25
299,35 - 22,45	= 276,90	299,35 – 44,90	= 254,45

FORMULA II

$\frac{7,5}{100}$ X 299.1	= 22.43	$\frac{15}{100}$ x 299.1	= 44,87
299.1+ 22.43	= 321.53	299.1 + 44,87	= 343,97
299.1- 22.43	= 276.66	299.1 – 44,87	= 354,23

FORMULA III

$\frac{7,5}{100}$ X 299	= 22.425	$\frac{15}{100}$ x 299	= 44,85
299 + 22.425	= 321.425	299 + 44,85	= 343,85
299 - 321.425	= 276.575	299- 44,85	= 254,15

FORMULA IV

$\frac{7,5}{100}$ X 299,75	= 22,48	$\frac{15}{100}$ x 299,75	= 44,85
299,75 + 22,48	= 322,23	299,75 + 44,85	= 344,60
299,75 - 22,48	= 277,27	299,75 - 44,85	= 254,49

FORMULA V

$\frac{7,5}{100}$ X 299,45	= 22,46	$\frac{15}{100}$ x 299,45	= 44,92
299,45 + 22,46	= 321,91	299,45 + 44,92	= 344,37
299,45 - 22,46	= 276,99	299,45 – 44,92	= 254,53

RUMUS CV = $\frac{SD}{rata-rata}\ x\ 100\%$

Lampiran 6. Kerapuhan

Kerapuhan = $\frac{Berat\ awal - berat\ akhir}{berat\ akhir}\ x100\%$

Formula	Berat awal (gram)	Berat akhir (gram)	F (%)	Rata-rata
Formula I	5.935	5.906	0.49	0.50
	5.981	5.949	0.54	
	5.98	5.95	0.50	
Formula II	5.935	5.906	0.49	0.51
	5.985	5.955	0.50	
	5.977	5.946	0.52	
Formula III	5.995	5.959	0.60	0.58
	5.963	5.928	0.59	
	5.971	5.938	0.56	
Formula IV	5.968	5.942	0.44	0.45
	5.981	5.955	0.44	
	5.988	5.959	0.49	
Formula V	6.099	6.077	0.36	0.35
	6.056	6.032	0.40	
	6.04	6.022	0.30	

Lampiran 7. Kekerasan

Kekerasan	Formulasi I	Formula II	Formula III	Formula IV	Formula V
replikasi 1	9	9,1	8,20	9,6	10,50
replikasi 2	9	9	8,20	9,6	10,60
replikasi 3	9,5	9,2	8,10	9,5	10,40
Rata-rata	9,17	9,10	8,17	9,57	10,50
SD	0,29	0,10	0,06	0,06	0,10

Lampiran 8. Keseragaman kandungan

Uji keseragaman kandungan =

Y = a + bx

0,0456 = 0,0948 x 0,0364x

$x = \frac{0,456-0,0364}{0,0948}$

= 9,92

$= \frac{9,92}{1000\ ml}$ x 100 ml x 50 (factor pengenceran)

$= \frac{49,62\ mg}{50\ mg}$ x 100%

= 99,23 %

FORMULA 1

absorbansi	FP	kadar (ppm)	kadar (mg)	% kadar
0,456	50	9,92	49,62	99,23
0,42	50	8,93	44,67	89,34
0,454	50	9,87	49,34	98,68
0,46	50	10,03	50,16	100,33
0,434	50	9,32	46,59	93,19
0,451	50	9,79	48,93	97,86
0,416	50	8,82	44,12	88,24
0,419	50	8,91	44,53	89,07
0,445	50	9,62	48,10	96,21
0,436	50	9,37	46,87	93,74
Rata-rata			47,29	94,59
SD			2,27	
CV			4,80	

FORMULA 2

absorbansi	FP	kadar (ppm)	kadar (mg)	% kadar
0,453	50	9.84	49.20	196.81
0,459	50	10.01	50.03	200.11
0,427	50	9.13	45.63	182.53
0,456	50	9.92	49.62	198.46
0,457	50	9.95	49.75	199.01
0,451	50	9.79	48.93	195.71
0,500	50	11.13	55.66	222.64
0,452	50	9.81	49.07	196.26
0,449	50	9.73	48.65	194.62
0.454	50	9.87	49.34	197.36
rata-rata			49.59	198.35
SD			2.46	
CV			4.96	

FORMULA 3

absorbansi	FP	kadar (ppm)	kadar (mg)	% kadar
0.453	50	9.84	49.20	196.81
0.459	50	10.01	50.03	200.11
0.427	50	9.13	45.63	182.53
0.456	50	9.92	49.62	198.46
0.457	50	9.95	49.75	199.01
0.451	50	9.79	48.93	195.71
0.5	50	11.13	55.66	222.64
0.452	50	9.81	49.07	196.26
0.449	50	9.73	48.65	194.62
0.454	50	9.87	49.34	197.36
	rata-rata		49.59	198.35
	SD		2.46	
	CV		4.96	

FORMULA 4

absorbansi	FP	kadar (ppm)	kadar (mg)	% kadar
0.479	50	10.55	52.77	105.55
0.451	50	9.79	48.93	97.86
0.459	50	10.01	50.03	100.05
0.459	50	10.01	50.03	100.05
0.423	50	9.02	45.08	90.16
0.453	50	9.84	49.20	98.41
0.459	50	10.01	50.03	100.05
0.46	50	10.03	50.16	100.33
0.472	50	10.36	51.81	103.63
0.437	50	9.40	47.01	94.01
	rata-rata		49.51	99.01
	SD		2.20	
	CV		4.44	

FORMULA 5

absorbansi	FP	kadar (ppm)	kadar (mg)	% kadar
0.448	50	9.70	48.52	97.03
0.466	50	10.20	50.99	101.98
0.435	50	9.35	46.73	93.46
0.459	50	10.01	50.03	100.05
0.434	50	9.32	46.59	93.19
0.428	50	9.15	45.77	91.54
0.467	50	10.23	51.13	102.25
0.452	50	9.81	49.07	98.13
0.461	50	10.06	50.30	100.60
0.469	50	10.28	51.40	102.80
	rata-rata		49.05	98.10
	SD		2.07	
	CV		4.22	

Lampiran 9. DISOLUSI

Kurva baku

kadar (ppm)	absorbansi
4	0,247
8	0,412
12	0,475
16	0,686
20	0,838

FORMULA 1

REPLIKASI 1

menit	abosrbansi	fp	kadar sampel	kadar (ppm)	jumlah (mg)	koreksi	total koreksi	jumlah obat yg terdisolusi	% disolusi
0	0	0	0	0	0	0	0	0	0
5	0.342	1	6.791	6.791	6.112	0.00	0.00	6.11	12.22
10	0.379	1	7.808	7.808	7.027	0.07	0.07	7.09	14.19
15	0.46	1	10.033	10.033	9.030	0.08	0.15	9.18	18.35
30	0.595	1	13.742	13.742	12.368	0.10	0.25	12.61	25.23
60	0.816	1	19.813	19.813	17.832	0.14	0.38	18.22	36.43
120	0.823	1	20.005	20.005	18.005	0.20	0.58	18.59	37.17
180	0.533	2	12.038	24.077	21.669	0.20	0.78	22.45	44.90
240	0.615	2	14.291	28.582	25.724	0.24	1.02	26.75	53.49
300	0.658	2	15.473	30.945	27.851	0.29	1.31	29.16	58.32
360	0.716	2	17.066	34.132	30.719	0.31	1.62	32.34	64.67

REPLIKASI 2

menit	abosrbansi	fp	kadar sampel	kadar (ppm)	jumlah (mg)	koreksi	total koreksi	jumlah obat yg terdisolusi	% disolusi
0	0	0	0	0	0	0	0	0	0
5	0.332	1	6.516	6.516	5.865	0.00	0.00	5.86	11.73
10	0.375	1	7.698	7.698	6.928	0.07	0.07	6.99	13.99
15	0.46	1	10.033	10.033	9.030	0.08	0.14	9.17	18.34
30	0.591	1	13.632	13.632	12.269	0.10	0.24	12.51	25.02
60	0.832	1	20.253	20.253	18.227	0.14	0.38	18.61	37.21
120	0.858	1	20.967	20.967	18.870	0.20	0.58	19.45	38.90
180	0.55	2	12.505	25.011	22.510	0.21	0.79	23.30	46.60
240	0.632	2	14.758	29.516	26.565	0.25	1.04	27.61	55.21
300	0.678	2	16.022	32.044	28.840	0.30	1.34	30.18	60.35
360	0.73	2	17.451	34.901	31.411	0.32	1.66	33.07	66.14

REPLIKASI 3

menit	abosrbansi	fp	kadar sampel	kadar (ppm)	jumlah (mg)	koreksi	total koreksi	jumlah obat yg terdisolusi	% disolusi
0	0	0	0	0	0	0	0	0	0
5	0.342	1	6.805	6.805	6.124	0.00	0.00	6.12	12.25
10	0.38	1	7.849	7.849	7.064	0.07	0.07	7.13	14.26
15	0.466	1	10.212	10.212	9.190	0.08	0.15	9.34	18.67
30	0.598	1	13.838	13.838	12.454	0.10	0.25	12.70	25.41
60	0.848	1	20.706	20.706	18.635	0.14	0.39	19.02	38.04
120	0.864	1	21.146	21.146	19.031	0.21	0.59	19.63	39.25
180	0.573	2	13.151	26.302	23.672	0.21	0.81	24.48	48.96
240	0.652	2	15.321	30.643	27.579	0.26	1.07	28.65	57.29
300	0.69	2	16.365	32.731	29.458	0.31	1.38	30.83	61.67
360	0.734	2	17.574	35.148	31.634	0.33	1.70	33.34	66.67

FORMULA 2

REPLIKASI 1

menit	abosrbansi	fp	kadar sampel	kadar (ppm)	jumlah (mg)	koreksi	total koreksi	jumlah obat yg terdisolusi	% disolusi
0	0	0	0	0	0	0	0	0	0
5	0.194	1	2.725	2.725	2.453	0.00	0.00	2.45	4.91
10	0.244	1	4.099	4.099	3.689	0.03	0.03	3.72	7.43
15	0.31	1	5.912	5.912	5.321	0.04	0.07	5.39	10.78
30	0.474	1	10.418	10.418	9.376	0.06	0.13	9.50	19.01
60	0.705	1	16.764	16.764	15.087	0.10	0.23	15.32	30.64
120	0.892	1	21.901	21.901	19.711	0.17	0.40	20.11	40.22
180	0.47	2	10.308	20.615	18.554	0.22	0.62	19.17	38.34
240	0.545	2	12.368	24.736	22.263	0.21	0.82	23.09	46.17
300	0.617	2	14.346	28.692	25.823	0.25	1.07	26.89	53.79
360	0.657	2	15.445	30.890	27.801	0.29	1.36	29.16	58.32

REPLIKASI 2

menit	abosrbansi	fp	kadar sampel	kadar (ppm)	jumlah (mg)	koreksi	total koreksi	jumlah obat yg terdisolusi	% disolusi
0	0	0	0	0	0	0	0	0	0
5	0.197	1	2.808	2.808	2.527	0.00	0.00	2.53	5.05
10	0.246	1	4.154	4.154	3.738	0.03	0.03	3.77	7.53
15	0.308	1	5.857	5.857	5.271	0.04	0.07	5.34	10.68
30	0.465	1	10.170	10.170	9.153	0.06	0.13	9.28	18.56
60	0.699	1	16.599	16.599	14.939	0.10	0.23	15.17	30.34
120	0.874	1	21.407	21.407	19.266	0.17	0.40	19.66	39.32
180	0.544	2	12.341	24.681	22.213	0.21	0.61	22.82	45.65
240	0.556	2	12.670	25.341	22.807	0.25	0.86	23.66	47.33
300	0.604	2	13.989	27.978	25.180	0.25	1.11	26.29	52.58
360	0.667	2	15.720	31.440	28.296	0.28	1.39	29.69	59.37

REPLIKASI 3

menit	abosrbansi	fp	kadar sampel	kadar (ppm)	jumlah (mg)	koreksi	total koreksi	jumlah obat yg terdisolusi	% disolusi
0	0	0	0	0	0	0	0	0	0
5	0.205	1	3.027	3.027	2.725	0.00	0.00	2.72	5.45
10	0.247	1	4.181	4.181	3.763	0.03	0.03	3.79	7.59
15	0.307	1	5.830	5.830	5.247	0.04	0.07	5.32	10.64
30	0.474	1	10.418	10.418	9.376	0.06	0.13	9.51	19.01
60	0.706	1	16.791	16.791	15.112	0.10	0.23	15.35	30.69
120	0.894	1	21.956	21.956	19.760	0.17	0.40	20.16	40.33
180	0.552	2	12.560	25.121	22.609	0.22	0.62	23.23	46.46
240	0.569	2	13.027	26.055	23.449	0.25	0.87	24.32	48.65
300	0.609	2	14.126	28.253	25.427	0.26	1.13	26.56	53.12
360	0.67	2	15.802	31.604	28.444	0.28	1.42	29.86	59.72

FORMULASI 3

REPLIKASI 1

menit	abosrbansi	fp	kadar sampel	kadar (ppm)	jumlah (mg)	koreksi	total koreksi	jumlah obat yg terdisolusi	% disolusi
0	0	0	0	0	0	0	0	0	0
5	0.142	1	1.310	1.310	1.179	0.00	0.00	1.18	2.36
10	0.206	1	3.069	3.069	2.762	0.01	0.01	2.77	5.55
15	0.255	1	4.415	4.415	3.973	0.03	0.04	4.02	8.03
30	0.39	1	8.124	8.124	7.311	0.04	0.09	7.40	14.80
60	0.604	1	14.003	14.003	12.602	0.08	0.17	12.77	25.54
120	0.746	1	17.904	17.904	16.113	0.14	0.31	16.42	32.85
180	0.455	2	9.909	19.819	17.837	0.18	0.49	18.33	36.65
240	0.529	2	11.942	23.885	21.496	0.20	0.69	22.18	44.37
300	0.623	2	14.525	29.049	26.145	0.24	0.93	27.07	54.14
360	0.648	2	15.212	30.423	27.381	0.29	1.22	28.60	57.19

REPLIKASI 2

menit	abosrbansi	fp	kadar sampel	kadar (ppm)	jumlah (mg)	koreksi	total koreksi	jumlah obat yg terdisolusi	% disolusi
0	0	0	0	0	0	0	0	0	0
5	0.174	1	2.176	2.176	1.958	0.00	0.00	1.96	3.92
10	0.209	1	3.137	3.137	2.824	0.02	0.02	2.85	5.69
15	0.27	1	4.813	4.813	4.332	0.03	0.05	4.39	8.77
30	0.413	1	8.742	8.742	7.868	0.05	0.10	7.97	15.94
60	0.658	1	15.473	15.473	13.925	0.09	0.19	14.11	28.23
120	0.782	1	18.879	18.879	16.991	0.15	0.34	17.33	34.67
180	0.469	2	10.280	20.560	18.504	0.19	0.53	19.04	38.07
240	0.555	2	12.643	25.286	22.757	0.21	0.74	23.49	46.99
300	0.624	2	14.538	29.077	26.169	0.25	0.99	27.16	54.32
360	0.661	2	15.555	31.110	27.999	0.29	1.28	29.28	58.56

REPLIKASI 3

menit	abosrbansi	fp	kadar sampel	kadar (ppm)	jumlah (mg)	koreksi	total koreksi	jumlah obat yg terdisolusi	% disolusi
0	0	0	0	0	0	0	0	0	0
5	0.114	1	0.527	0.527	0.475	0.00	0.00	0.47	0.95
10	0.179	1	2.313	2.313	2.082	0.01	0.01	2.09	4.17
15	0.233	1	3.797	3.797	3.417	0.02	0.03	3.45	6.89
30	0.419	1	8.907	8.907	8.016	0.04	0.07	8.08	16.16
60	0.666	1	15.692	15.692	14.123	0.09	0.16	14.28	28.56
120	0.791	1	19.126	19.126	17.214	0.16	0.31	17.53	35.05
180	0.499	2	11.104	22.209	19.988	0.19	0.50	20.49	40.98
240	0.558	2	12.725	25.451	22.905	0.22	0.73	23.63	47.26
300	0.618	2	14.374	28.747	25.873	0.25	0.98	26.85	53.71
360	0.64	2	14.978	29.956	26.960	0.29	1.27	28.23	56.46

FORMULA 4

REPLIKASI 1

menit	abosrbansi	fp	kadar sampel	kadar (ppm)	jumlah (mg)	koreksi	total koreksi	jumlah obat yg terdisolusi	% disolusi
0	0	0	0	0	0	0	0		0
5	0.297	1	5.555	5.555	4.999	0.00	0.00	5.00	10.00
10	0.335	1	6.599	6.599	5.939	0.06	0.06	5.99	11.99
15	0.381	1	7.863	7.863	7.076	0.07	0.12	7.20	14.40
30	0.47	1	10.308	10.308	9.277	0.08	0.20	9.48	18.95
60	0.741	1	17.753	17.753	15.977	0.10	0.30	16.28	32.56
120	0.87	1	21.297	21.297	19.167	0.18	0.48	19.65	39.30
180	0.546	2	12.396	24.791	22.312	0.21	0.69	23.01	46.01
240	0.612	2	14.209	28.418	25.576	0.25	0.94	26.52	53.03
300	0.658	2	15.473	30.945	27.851	0.28	1.23	29.08	58.15
360	0.712	2	16.956	33.912	30.521	0.31	1.54	32.06	64.11

REPLIKASI 2

menit	abosrbansi	fp	kadar sampel	kadar (ppm)	jumlah (mg)	koreksi	total koreksi	jumlah obat yg terdisolusi	% disolusi
0	0	0	0	0	0	0	0	0	0
5	0.289	1	5.335	5.335	4.802	0.00	0.00	4.80	9.60
10	0.316	1	6.077	6.077	5.469	0.05	0.05	5.52	11.05
15	0.355	1	7.148	7.148	6.434	0.06	0.11	6.55	13.10
30	0.45	1	9.758	9.758	8.782	0.07	0.19	8.97	17.94
60	0.736	1	17.615	17.615	15.854	0.10	0.28	16.14	32.27
120	0.86	1	21.022	21.022	18.920	0.18	0.46	19.38	38.76
180	0.593	2	13.687	27.374	24.636	0.21	0.67	25.31	50.61
240	0.66	2	15.527	31.055	27.949	0.27	0.94	28.89	57.79
300	0.708	2	16.846	33.692	30.323	0.31	1.25	31.58	63.15
360	0.71	2	16.901	33.802	30.422	0.34	1.59	32.01	64.03

REPLIKASI 3

menit	abosrbansi	fp	kadar sampel	kadar (ppm)	jumlah (mg)	koreksi	total koreksi	jumlah obat yg terdisolusi	% disolusi
0	0	0	0	0	0	0	0	0	0
5	0.284	1	5.198	5.198	4.678	0.00	0.00	4.68	9.36
10	0.31	1	5.912	5.912	5.321	0.05	0.05	5.37	10.75
15	0.384	1	7.945	7.945	7.151	0.06	0.11	7.26	14.52
30	0.472	1	10.363	10.363	9.326	0.08	0.19	9.52	19.03
60	0.748	1	17.945	17.945	16.151	0.10	0.29	16.44	32.89
120	0.876	1	21.462	21.462	19.315	0.18	0.47	19.79	39.58
180	0.523	2	11.764	23.527	21.175	0.21	0.69	21.86	43.73
240	0.637	2	14.896	29.791	26.812	0.24	0.92	27.74	55.47
300	0.66	2	15.527	31.055	27.949	0.30	1.22	29.17	58.34
360	0.727	2	17.368	34.736	31.263	0.31	1.53	32.79	65.59

FORMULA 5

REPLIKASI 1

menit	abosrbansi	fp	kadar sampel	kadar (ppm)	jumlah (mg)	koreksi	total koreksi	jumlah obat yg terdisolusi	% disolusi
0	0	0	0	0	0	0	0	0	0
5	0.2	1	2.890	2.890	2.601	0.00	0.00	2.60	5.20
10	0.256	1	4.429	4.429	3.986	0.03	0.03	4.01	8.03
15	0.311	1	5.940	5.940	5.346	0.04	0.07	5.42	10.84
30	0.462	1	10.088	10.088	9.079	0.06	0.13	9.21	18.42
60	0.706	1	16.791	16.791	15.112	0.10	0.23	15.35	30.69
120	0.45	2	9.758	19.516	17.565	0.17	0.40	17.97	35.93
180	0.533	2	12.038	24.077	21.669	0.20	0.60	22.27	44.53
240	0.623	2	14.511	29.022	26.120	0.24	0.84	26.96	53.91
300	0.658	2	15.473	30.945	27.851	0.29	1.13	28.98	57.96
360	0.718	2	17.121	34.242	30.818	0.31	1.44	32.25	64.51

REPLIKASI 2

menit	abosrbansi	fp	kadar sampel	kadar (ppm)	jumlah (mg)	koreksi	total koreksi	jumlah obat yg terdisolusi	% disolusi
0	0	0	0	0	0	0	0	0	0
5	0.21	1	3.165	3.165	2.848	0.00	0.00	2.85	5.70
10	0.286	1	5.253	5.253	4.727	0.03	0.03	4.76	9.52
15	0.36	1	7.286	7.286	6.557	0.05	0.08	6.64	13.28
30	0.507	1	11.324	11.324	10.192	0.07	0.16	10.35	20.70
60	0.743	1	17.808	17.808	16.027	0.11	0.27	16.30	32.59
120	0.425	2	9.071	18.143	16.329	0.18	0.45	16.78	33.55
180	0.583	2	13.412	26.824	24.142	0.18	0.63	24.77	49.54
240	0.659	2	15.500	31.000	27.900	0.27	0.90	28.80	57.60
300	0.659	2	15.500	31.000	27.900	0.31	1.21	29.11	58.22
360	0.725	2	17.313	34.626	31.164	0.31	1.52	32.68	65.36

REPLIKASI 3

menit	abosrbansi	fp	kadar sampel	kadar (ppm)	jumlah (mg)	koreksi	total koreksi	jumlah obat yg terdisolusi	% disolusi
0	0	0	0	0	0	0	0	0	0
5	0.212	1	3.220	3.220	2.898	0.00	0.00	2.90	5.80
10	0.295	1	5.500	5.500	4.950	0.03	0.03	4.98	9.96
15	0.363	1	7.368	7.368	6.631	0.06	0.09	6.72	13.44
30	0.505	1	11.269	11.269	10.142	0.07	0.16	10.30	20.61
60	0.749	1	17.973	17.973	16.175	0.11	0.27	16.45	32.90
120	0.46	2	10.033	20.066	18.059	0.18	0.45	18.51	37.03
180	0.53	2	11.956	23.912	21.521	0.20	0.65	22.17	44.35
240	0.657	2	15.445	30.890	27.801	0.24	0.89	28.69	57.39
300	0.657	2	15.445	30.890	27.801	0.31	1.20	29.00	58.01
360	0.707	2	16.819	33.637	30.274	0.31	1.51	31.78	63.57

Lampiran 10. DE360

DE360 = $\frac{AUC\ TOTAL}{LUAS\ TOTAL}$

FORMULA 1

	AUC		
menit	REP 1	REP 2	REP 3
5	30.56044	29.32418	30.62225
10	66.03462	64.29011	66.28255
15	81.35247	80.825	82.34492
30	326.8434	325.2445	330.5955
60	924.8852	933.5225	951.7574
120	2208.145	2283.475	2318.857
180	2462.278	2565.152	2646.16
240	2951.881	3054.409	3187.48
300	3354.356	3466.905	3568.79
360	3689.743	3794.611	3850.111
AUC tot	16096.08	16597.76	17033
L tot	36000	36000	36000
DE 360	44.71133	46.10488	47.31389

FORMULA 2

MENIT	REP 1	REP 2	REP 3
5	12.26374	12.63462	13.62363
10	30.84505	31.46731	32.59093
15	45.52692	45.53791	45.56126
30	223.3846	219.3379	222.375
60	744.6626	733.5115	745.5857
120	2125.744	2089.843	2130.574
180	2356.932	2549.097	2603.624
240	2535.541	2789.189	2853.211
300	2998.905	2997.224	3053.037
360	3363.27	3358.556	3385.292
AUC tot	14437.08	14826.4	15085.48
L tot	36000	36000	36000
DE 360	40.10299	41.18444	41.9041

FORMULA 3

MENIT	REP 1	REP 2	REP 3
5	5.896978	9.791209	2.373626
10	19.77157	24.01813	12.80934
15	33.9603	36.15192	27.66291
30	171.2452	185.3077	172.9162
60	605.1255	662.4841	670.8247
120	1751.659	1886.914	1908.277
180	2084.863	2182.273	2281.058
240	2430.458	2551.892	2647.365
300	2955.142	3039.29	3029.037
360	3339.979	3386.413	3304.853
AUC tot	13398.1	13964.54	14057.18
L tot	36000	36000	36000
DE 360	37.21695	38.79038	39.04771

FORMULA 4

MENIT	REP 1	REP 2	REP 3
5	24.99725	24.00824	23.39011
10	54.97005	51.62115	50.2544
15	65.96236	60.3511	63.17253
30	250.125	232.7349	251.6786
60	772.7341	753.1516	778.8495
120	2155.711	2130.969	2174.024
180	2559.218	2681.097	2499.119
240	2971.398	3251.914	2975.914
300	3335.631	3628.18	3414.389
360	3667.952	3815.38	3717.93
AUC tot	15858.7	16629.41	15948.72
L tot	36000	36000	36000
DE 360	44.05194	46.1928	44.302

FORMULA 5

MENIT	REP 1	REP 2	REP 3
15	13.00549	14.24176	14.48901
30	33.07857	38.03736	39.4
45	47.16703	57.0022	58.50357
60	219.4574	254.8516	255.3255
90	736.7176	799.3797	802.561
120	1998.705	1984.447	2097.689
180	2413.919	2492.908	2441.248
240	2953.371	3214.174	3052.141
300	3356.11	3474.363	3461.835
360	3673.958	3707.387	3647.255
AUC tot	15445.49	16036.79	15870.45
L tot	36000	36000	36000
DE 360	42.90414	44.54664	44.08458

Lampiran 11. Kinetika pelepasan

A. Analisis kinetika orde nol

waktu	% pelepasan				
	F1	F2	F3	F4	F5
5	12.07	5.14	2.41	9.65	5.56
10	14.15	7.52	5.14	11.26	9.17
15	18.46	10.70	7.90	14.00	12.52
30	25.22	18.86	15.63	18.64	19.91
60	37.23	30.56	27.44	32.57	32.06
120	38.44	39.96	34.19	39.21	35.50
180	46.82	43.48	38.57	46.78	46.14
240	55.33	47.38	46.21	55.43	56.30
300	60.11	53.16	54.05	55.27	58.06
360	65.83	59.14	57.40	64.52	64.48

B. Analisis kinetika orde Satu

waktu	log % pelepasan				
	F1	F2	F3	F4	F5
5	1.08	0.71	0.38	0.98	0.75
10	1.15	0.88	0.71	1.05	0.96
15	1.27	1.03	0.90	1.15	1.10
30	1.40	1.28	1.19	1.27	1.30
60	1.57	1.49	1.44	1.51	1.51
120	1.58	1.60	1.53	1.59	1.55
180	1.67	1.64	1.59	1.67	1.66
240	1.74	1.68	1.66	1.74	1.75
300	1.78	1.73	1.73	1.74	1.76
360	1.82	1.77	1.76	1.81	1.81

C. Analisis kinetika Higuchi

akar t	% pelepasan				
	F1	F2	F3	F4	F5
2.24	12.07	5.14	2.41	9.65	5.56
3.16	14.15	7.52	5.14	11.26	9.17
3.87	18.46	10.70	7.90	14.00	12.52
5.48	25.22	18.86	15.63	18.64	19.91
7.75	37.23	30.56	27.44	32.57	32.06
10.95	38.44	39.96	34.19	39.21	35.50
13.42	46.82	43.48	38.57	46.78	46.14
15.49	55.33	47.38	46.21	55.43	56.30
17.32	60.11	53.16	54.05	55.27	58.06
18.97	65.83	59.14	57.40	64.52	64.48

Lampiran 12. Uji mutu fisik granul dan tablet formula optimum

a. Waktu alir

waktu alir	detik
replikasi 1	8.5
replikasi 2	8.3
replikasi 3	8.4
rata-rata	8.40
SD	0.10
CV	1.19

b. Sudut diam

Formula optimum	d	h	r	$\frac{h}{r}$	Sudut diam
Replikasi 1	9	2.445	4.5	0.543333333	28.51670789
Replikasi 2	9.2	2.405	4.6	0.522826087	27.60174231
Replikasi 3	9.2	2.45	4.6	0.532608696	28.04015298
				Rata-rata	28.05
				SD	0.46
				CV	1.63

c. Kerapuhan

	kerapuhan		
	bobot awal	bobot akhir	% kerapuhan
replikasi 1	5.932	5.9	0.54
replikasi 2	5.881	5.85	0.53
replikasi 3	5.922	5.892	0.51
		rata-rata	0.53
		SD	0.02
		CV	3.18

d. Kekerasan

kekerasan	
Replikasi 1	8.5
Replikasi 2	8.3
Replikasi 3	8.9
Rata-rata	8.57
SD	0.31
CV	3.57

e. Keseragaman bobot

Keseragaman bobot
299
298
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303
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300
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301
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299
300
298
299
Rata-rata 299.05
SD 1.90
CV 0.64

f. Keseragaman kandungan

absorbansi	FP	kadar (ppm)	kadar (mg)	% kadar
0.44	50	9.51	47.55	95.11
0.46	50	9.92	49.62	99.23
0.45	50	9.73	48.65	97.31
0.42	50	8.88	44.40	88.79
0.47	50	10.36	51.81	103.63
0.43	50	9.13	45.63	91.26
0.48	50	10.50	52.50	105.00
0.43	50	9.07	45.36	90.71
0.46	50	9.92	49.62	99.23
0.43	50	9.32	46.59	93.19
rata-rata			48.17	94.59
SD			2.75	
CV			5.70	

g. Uji disolusi formula optimum

menit	abosrbansi	fp	kadar sampel	kadar (ppm)	jumlah (mg)	koreksi	total koreksi	jumlah obat yg terdisolusi	% disolusi
0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
5	0.18	1.00	2.23	2.23	2.01	0.00	0.00	2.01	4.02
10	0.19	1.00	2.70	2.70	2.43	0.02	0.02	2.45	4.90
15	0.29	1.00	5.45	5.45	4.90	0.03	0.05	4.95	9.90
30	0.43	1.00	9.29	9.29	8.36	0.05	0.10	8.47	16.93
60	0.68	1.00	15.99	15.99	14.40	0.09	0.20	14.59	29.18
120	0.80	1.00	19.29	19.29	17.36	0.16	0.36	17.72	35.44
180	0.51	2.00	11.27	22.54	20.28	0.19	0.55	20.83	41.67
240	0.57	2.00	13.08	26.16	23.55	0.23	0.77	24.32	48.65
300	0.62	2.00	14.40	28.80	25.92	0.26	1.04	26.96	53.92
360	0.66	2.00	15.39	30.78	27.70	0.29	1.32	29.03	58.05

menit	abosrbansi	fp	kadar sampel	kadar (ppm)	jumlah (mg)	koreksi	total koreksi	jumlah obat yg terdisolusi	% disolusi
0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
5	0.20	1.00	3.00	3.00	2.70	0.00	0.00	2.70	5.40
10	0.21	1.00	3.16	3.16	2.85	0.03	0.03	2.88	5.76
15	0.31	1.00	5.83	5.83	5.25	0.03	0.06	5.31	10.62
30	0.48	1.00	10.58	10.58	9.52	0.06	0.12	9.64	19.29
60	**0.67**	**1.00**	**15.91**	**15.91**	**14.32**	**0.11**	**0.23**	**14.55**	**29.09**
120	0.77	1.00	18.49	18.49	16.65	0.16	0.38	17.03	34.06
180	0.48	2.00	10.66	21.33	19.20	0.18	0.57	19.77	39.53
240	0.56	2.00	12.81	25.62	23.05	0.21	0.78	23.84	47.67
300	0.61	2.00	14.15	28.31	25.48	0.26	1.04	26.52	53.03
360	**0.66**	**2.00**	**15.39**	**30.78**	**27.70**	**0.28**	**1.32**	**29.02**	**58.05**

menit	abosrbansi	fp	kadar sampel	kadar (ppm)	jumlah (mg)	koreksi	total koreksi	jumlah obat yg terdisolusi	% disolusi
0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
5	0.19	1.00	2.53	2.53	2.28	0.00	0.00	2.28	4.56
10	0.20	1.00	2.75	2.75	2.48	0.03	0.03	2.50	5.01
15	0.31	1.00	5.80	5.80	5.22	0.03	0.05	5.27	10.55
30	0.48	1.00	10.61	10.61	9.55	0.06	0.11	9.66	19.32
60	**0.68**	**1.00**	**16.02**	**16.02**	**14.42**	**0.11**	**0.22**	**14.64**	**29.27**
120	0.80	1.00	19.40	19.40	17.46	0.16	0.38	17.84	35.68
180	0.51	2.00	11.46	22.92	20.63	0.19	0.57	21.20	42.40
240	0.56	2.00	12.86	25.73	23.15	0.23	0.80	23.95	47.91
300	0.60	2.00	13.88	27.76	24.98	0.26	1.06	26.04	52.08
360	**0.66**	**2.00**	**15.42**	**30.84**	**27.75**	**0.28**	**1.34**	**29.09**	**58.17**

Rata-rata kadar % pelepasan formula optimum

Replikasi 1	Replikasi 2	Replikasi 3	Rata-rata
4.02	5.40	4.56	4.66
4.90	5.76	5.01	5.22
9.90	10.62	10.55	10.36
16.93	19.29	19.32	18.51
29.18	**29.09**	**29.27**	**29.18**
35.44	34.06	35.68	35.06
41.67	39.53	42.40	41.20
48.65	47.67	47.91	48.08
53.92	53.03	52.08	53.01
58.05	**58.05**	**58.17**	**58.09**

DE_{360}

waktu (menit)	AUC
5	11.40
10	23.91
15	38.89
30	224.02
60	728.90
120	1948.50
180	2342.41
240	2709.31
300	2999.60
360	3307.62
AUC tot	14334.55
L tot	36000.00
DE 360	39.82

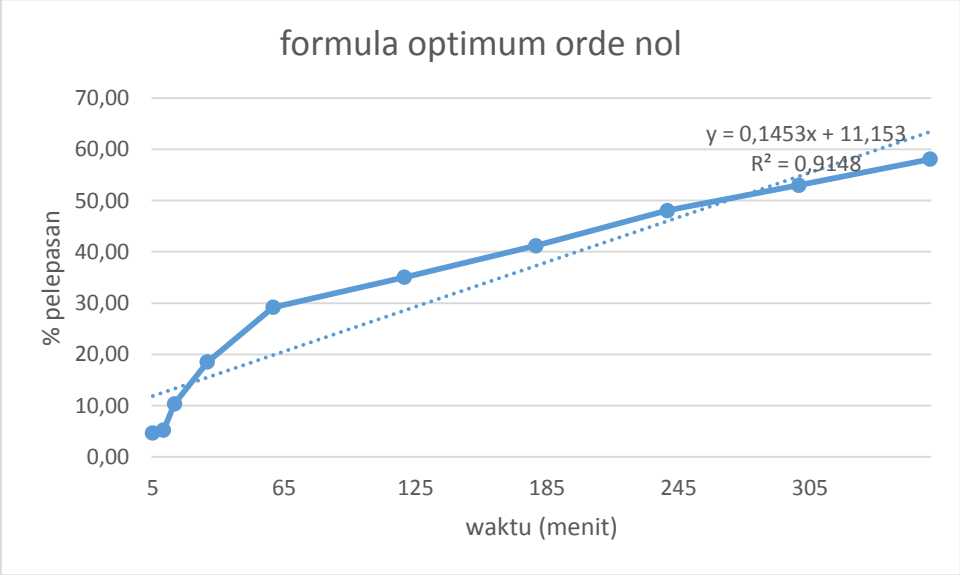
waktu (menit)	AUC
5	13.50
10	27.89
15	40.93
30	224.29
60	725.72
120	1894.60
180	2207.79
240	2616.21
300	3021.19
360	3332.45
AUC tot	14104.57
L tot	36000.00
DE 360	39.18

waktu (menit)	AUC
5	10.04
10	22.29
15	37.00
30	201.23
60	691.73
120	1938.62
180	2313.17
240	2709.44
300	3076.91
360	3359.12
AUC tot	14359.55
L tot	36000.00
DE 360	39.89

Lampiran 13. analisis kinetika formula optimum

a. Analisis kinetika orde nol

menit	% pelepasan
5	4.66
10	5.22
15	10.36
30	18.51
60	29.18
120	35.06
180	41.20
240	48.08
300	53.01
360	58.09



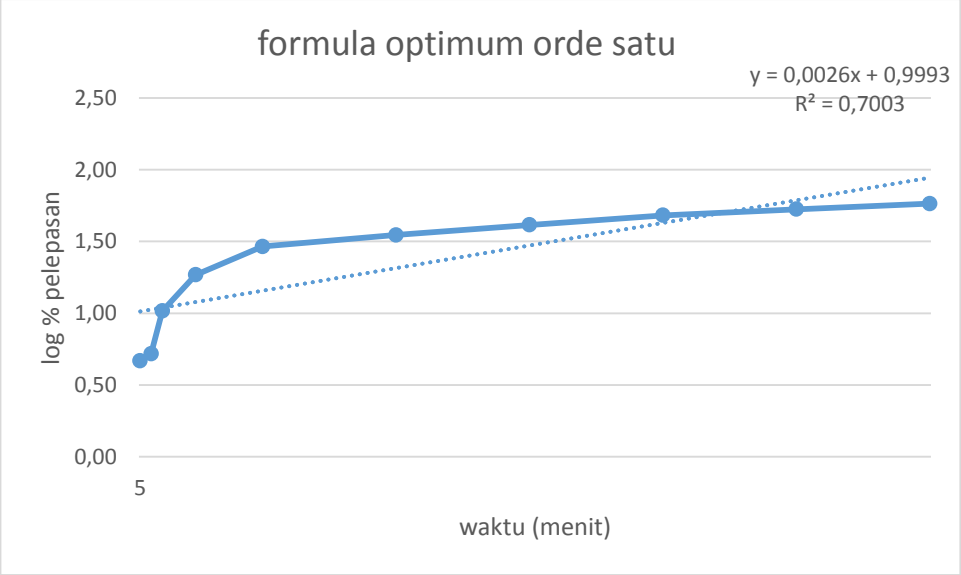
Persamaan regresi linier :

Y = 0,1453 + 11,153

r = 0.956452

b. Analisis kinetika orde satu

waktu	log % pelepasan
5	0.67
10	0.72
15	1.02
30	1.27
60	1.47
120	1.54
180	1.61
240	1.68
300	1.72
360	1.76



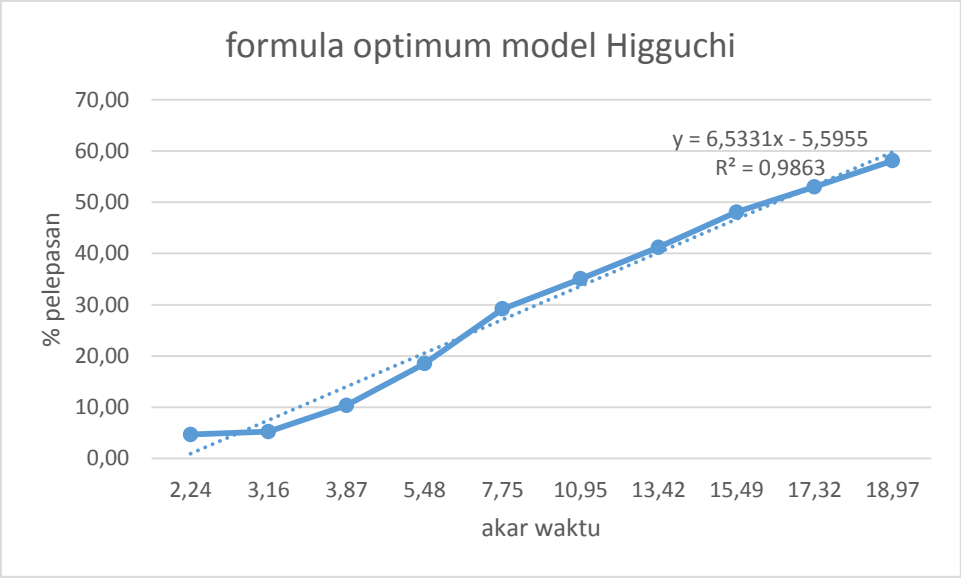
Persamaan regresi linier :

Y = 0,0026x + 0,9993

r = 0,836839

c. Analisis model Higuchi

akar waktu	% pelepasan
2.24	4.66
3.16	5.22
3.87	10.36
5.48	18.51
7.75	29.18
10.95	35.06
13.42	41.20
15.49	48.08
17.32	53.01
18.97	58.09



Persamaan regresi linier :

Y = 6,5331x – 5,5955

r = 0.993126377

Lampiran 14. Analisis statistik

a. Waktu alir

One-Sample Kolmogorov-Smirnov Test

		WA
N		3
Normal Parameters[a,,b]	Mean	8.4000
	Std. Deviation	.10000
Most Extreme Differences	Absolute	.175
	Positive	.175
	Negative	-.175
Kolmogorov-Smirnov Z		.303
Asymp. Sig. (2-tailed)		1.000

a. Test distribution is Normal.

b. Calculated from data.

One-Sample Test

	Test Value = 8.5					
					95% Confidence Interval of the Difference	
	T	df	Sig. (2-tailed)	Mean Difference	Lower	Upper
WA	-1.732	2	.225	-.10000	-.3484	.1484

b. Kerapuhan

One-Sample Test

	Test Value = 0.52					
					95% Confidence Interval of the Difference	
	T	df	Sig. (2-tailed)	Mean Difference	Lower	Upper
KERAPUHAN	.756	2	.529	.00667	-.0313	.0446

One-Sample Kolmogorov-Smirnov Test

		KERAPUHAN
N		3
Normal Parameters[a,,b]	Mean	.5267
	Std. Deviation	.01528
Most Extreme Differences	Absolute	.253
	Positive	.196
	Negative	-.253
Kolmogorov-Smirnov Z		.438
Asymp. Sig. (2-tailed)		.991

a. Test distribution is Normal.

b. Calculated from data.

c. Q_{60}

One-Sample Kolmogorov-Smirnov Test

		Q60
N		3
Normal Parameters[a,,b]	Mean	29.4500
	Std. Deviation	.39230
Most Extreme Differences	Absolute	.343
	Positive	.343
	Negative	-.246
Kolmogorov-Smirnov Z		.595
Asymp. Sig. (2-tailed)		.871

a. Test distribution is Normal.

b. Calculated from data.

One-Sample Test

	Test Value = 29.22					
					95% Confidence Interval of the Difference	
	T	df	Sig. (2-tailed)	Mean Difference	Lower	Upper
Q60	-.770	2	.522	-.04000	-.2636	.1836

d. Q_{360}

One-Sample Kolmogorov-Smirnov Test

		Q360
N		3
Normal Parameters[a,,b]	Mean	58.0900
	Std. Deviation	.06928
Most Extreme Differences	Absolute	.385
	Positive	.385
	Negative	-.282
Kolmogorov-Smirnov Z		.667
Asymp. Sig. (2-tailed)		.766

a. Test distribution is Normal.

b. Calculated from data.

One-Sample Test

	Test Value = 58.08					
					95% Confidence Interval of the Difference	
	T	df	Sig. (2-tailed)	Mean Difference	Lower	Upper
Q360	.250	2	.826	.01000	-.1621	.1821

e. DE_{360}

One-Sample Kolmogorov-Smirnov Test

		DE360
N		3
Normal Parameters[a,,b]	Mean	39.6300
	Std. Deviation	.39128
Most Extreme Differences	Absolute	.353
	Positive	.253
	Negative	-.353
Kolmogorov-Smirnov Z		.611
Asymp. Sig. (2-tailed)		.849

a. Test distribution is Normal.

b. Calculated from data.

One-Sample Test

	Test Value = 39.28					
					95% Confidence Interval of the Difference	
	T	df	Sig. (2-tailed)	Mean Difference	Lower	Upper
DE360	1.549	2	.261	.35000	-.6220	1.3220