

BAB V

KESIMPULAN DAN SARAN

A. Kesimpulan

1. Peningkatan konsentrasi HPMC berpengaruh terhadap sifat fisik patch terutama pada keseragaman bobot, dan *swelling index*. Peningkatan konsentrasi HPMC diikuti dengan penurunan *swelling index patch*, dari data yang didapat nilai *swelling index* terkecil pada formula 2 pada menit 180 peningkatan HPMC sebesar 75% yaitu sebesar 13.6%.
2. Pelepasan obat pada sediaan bukal *patch* mucoadesiv isosorbid dinitrat mengikuti kinetika orde nol dilihat dari harga koefisien korelasi untuk formula 1 sebesar 0,96, formula 2 sebesar 0.99, formula 3 sebesar 0,969, formula 4 sebesar 0,918 dan kurva yang menunjukkan garis linier. Mekanisme pelepasan mengikuti mekanisme difusi *fick*.

B. Saran

1. Perlu dilakukan uji *in vivo* sehingga dapat diketahui bioavailabilitas sediaan bukal *patch* isosorbid dinitrat dan dapat dibuat korelasi *in vitro in vivo*.
2. Perlu dilakukan penelitian lebih lanjut untuk optimasi dari variasi kadar HPMC dan Carbopol untuk sediaan bukal Patch mukoadhesiv.
3. Perlu dilakukan uji daya lengket pada sediaan bukal *patch* mukoadhesif.

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Lampiran 1. Keseragaman bobot

Keseragaman Bobot

No	Bobot Patch (mg)					Kontrol
	F1	F2	F3	F4	F5	
1	95.3	111.2	115.4	92.5	123.7	101.2
2	102.2	118.9	110	97.1	113.3	98.7
3	92.6	90.7	106	102.3	113.9	104.3
4	99.3	91.5	109	95.2	115.3	92.6
5	93	93.7	111	100.8	95.1	98.5
6	97.6	86.5	107.5	98.7	127.1	100.7
7	95.5	88.4	99.2	93.5	122.3	98.5
8	87.7	114.5	110	98.8	117.4	105.4
9	92.3	102	97.6	95.9	111.9	93.3
10	96.6	103.3	100	89.5	120.8	96.4
Jumlah	952.1	1000.7	1065.7	964.3	1160.8	989.6
Mean	95.21	100.07	106.57	96.43	116.08	98.96
SD	3.8715	11.0588	4.6557	3.723	4.8346	3.9694
CV	4.06%	11.05%	4.30%	3.80%	4.09%	4.01%

Bobot rata-rata tiap Formula	Range 10%	Bobot rata-rata - range	Bobot rata-rata + range
95.21	9.521	85.689	104.731
115.57	11.557	104.013	127.127
106.57	10.657	95.913	117.227
96.43	9.643	86.787	106.073
116.08	11.608	104.472	127.688
98.96	9.896	89.064	108.856
Bobot rata-rata tiap Formula	Range 20 %	Bobot rata-rata - range	Bobot rata-rata + range
95.21	19.042	76.168	114.252
115.57	23.114	92.456	138.684
106.57	21.314	85.256	127.884
96.43	19.286	77.144	115.716
116.08	23.216	92.864	139.296
98.96	19.792	79.168	118.752

Lampiran 2. *Folding endurance**Folding Endurance*

Macam Patch	Patch 1	Patch 2	Patch 3	Patch 4	Patch 5	Kontrol
Folding Endurance	>300	>300	>300	>300	>300	>300

Lampiran 3. *Surface pH*

Surface pH

Macam Patch	Patch 1	Patch 2	Patch 3	Patch 4	Patch 5	Kontrol
Ph	6	6	6	6	6	6

Lampiran 4. Swelling index

Waktu (menit)	Patch 1 (%)	Patch 2 (%)	Patch 3 (%)	Patch 4 (%)	Patch 5 (%)	kontrol (%)
60	11.6	8.4	17.5	17.5	16.4	10.6
120	17.5	10.8	30.6	19.4	22.5	16.3
180	22.3	13.6	35.9	23.1	28.8	22.9
	24.46667	15.6	28	21	27.23333333	18.6

Lampiran 5. Luas Area pembuatan Kurva baku isosorbid dinitrat menggunakan Kromatografi kinerja Tinggi

Konsentrasi	Luas Area
100ppm	507219
50ppm	266321
20ppm	128507
15ppm	100975
10ppm	67548
5ppm	34927
1ppm	6985

Berdasarkan Data diatas, dengan regresi linier diperoleh persamaan :

$$a=16742,2295$$

$$b=4951,6736$$

$$r=0.99850$$

$$y= a + bx$$

$$= 16742,2295 + 4951,6736x$$

Lampiran 6. Keseragaman kandungan

Formula	berat Patch	kadar tiap patch teoritis	Luas area	x(ppm)	x(mg/ml)	% kadar	kadar (mg)	Rata-rata (mg/patch)	SD	CV(%)
1	96.6	32.4671778	122284	21.3144	0.021314	98.47343	31.971545	31.79494	0.25	0.785
	95.9	31.8836364	121118	21.0789	0.021079	99.1679	31.618331			
2	90.7	29.0036974	110980	19.0315	0.019031	98.42624	28.547248	28.52756	0.03	5.6
	91.5	29.2595183	110850	19.0052	0.019005	97.43109	28.507868			
3	111	33.3302055	125421	21.9479	0.021948	98.77476	32.92183	32.79733	0.18	0.537
	110	33.0299334	124599	21.7819	0.021782	98.91883	32.672823			
4	97.1	32.2223374	118855	20.6219	0.020622	95.99802	30.932805	30.68047	0.36	1.16
	98.7	32.7532925	117189	20.2854	0.020285	92.90097	30.428128			
5	122.3	33.7146795	121970	21.251	0.021251	94.54762	31.876426	32.41443	0.76	2.345
	120.8	33.3011716	125522	21.9683	0.021968	98.95275	32.952426			
control	105.4	34.0824576	18745	0.40446	0.000404	1.78008	0.606695	2.556348	1.16	11
	100.7	32.5626516	16891	0.03004	0.003004	13.83794	4.506			

Lampiran 7. Disolusi bukal patch mukoadhesif

Formula Satu

Waktu	Luas Area	Fp	Kadar (mg/100ml)	Kadar (mg/500ml)	Faktor Koreksi	Kadar terkoreksi	Kadar Terdisolusi (%)	Berat Patch	dosis(mg)
5	75671	2	2.380155691	11.900778	0	11.9008	34.6463	102.2	34.349333
10	77998	2	2.474144116	12.370721	0.119008	12.4897	36.3609	102.2	34.349333
15	78083	2	2.477577298	12.387886	0.123707	12.5116	36.4246	102.2	34.349333
30	99313	2	3.335065159	16.675326	0.123879	16.7992	48.9069	102.2	34.349333
60	101922	2	3.440443671	17.202218	0.166753	17.369	50.5657	102.2	34.349333
120	115320	2	3.981594041	19.90797	0.172022	20.08	58.4582	102.2	34.349333
180	122429	2	4.268729284	21.343646	0.19908	21.5427	62.7166	102.2	34.349333
240	130567	2	4.597426232	22.987131	0.213436	23.2006	67.543	102.2	34.349333
300	150953	2	5.420824608	27.104123	0.229871	27.334	79.5765	102.2	34.349333
360	160420	2	5.803200377	29.016002	0.271041	29.287	85.2623	102.2	34.349333
420	166790	2	6.060487125	30.302436	0.29016	30.5926	89.0631	102.2	34.349333
480	167477	2	6.088235319	30.441177	0.303024	30.7442	89.5045	102.2	34.349333

Formula Satu Replikasi 2

Waktu (menit)	Luas area	Fp	Kadar (mg/100ml)	Kadar (mg/500ml)	Faktor koreksi	kadar terkoreksi	Kadar Terdisolusi (%)	Berat Patch	dosisi (mg)
5	77671	2	2.46093646	12.304682	0	12.3047	36.8684	99.3	33.374646
10	78998	2	2.5145345	12.572673	0.123047	12.6957	38.04	99.3	33.374646
15	79083	2	2.517967683	12.589838	0.125727	12.7156	38.0995	99.3	33.374646
30	98731	2	3.311557955	16.55779	0.125898	16.6837	49.9891	99.3	33.374646
60	111922	2	3.844347515	19.221738	0.165578	19.3873	58.09	99.3	33.374646
120	125320	2	4.385497885	21.927489	0.192217	22.1197	66.277	99.3	33.374646
180	132429	2	4.672633128	23.363166	0.219275	23.5824	70.6597	99.3	33.374646
240	140567	2	5.001330076	25.00665	0.233632	25.2403	75.6271	99.3	33.374646
300	150953	2	5.420824608	27.104123	0.250067	27.3542	81.961	99.3	33.374646
360	155420	2	5.601248455	28.006242	0.271041	28.2773	84.7268	99.3	33.374646
420	160790	2	5.818144819	29.090724	0.280062	29.3708	88.0033	99.3	33.374646
480	163477	2	5.926673782	29.633369	0.290907	29.9243	89.6617	99.3	33.374646

Waktu (menit)	Kadar terdisolusi (%)		Rata-rata kadar terdisolusi (%)	SD
	Replikasi 1	Replikasi 2		
5	34.64632	37	35.75733474	0.0276
10	36.36091	38	37.20045875	1.659
15	36.42456	38	37.26201851	0.805
30	48.90693	50	49.44802041	2.618
60	50.56567	58	54.32781264	3.8978
120	58.45817	66	62.36757578	3.005
180	62.71658	71	66.68816297	4.591
240	67.54299	76	71.58505473	1.9221
300	79.57649	82	80.76874061	0.86
360	85.26233	85	84.99458854	1.0422
420	89.06314	88	88.53321719	0.661
480	89.50451	90	89.58310553	0.803

%Kadar Terdisolusi Formula 2

Waktu(menit)	Luas Area	Fp	Kadar (mg/100ml)	Kadar (mg/500ml)	Faktor Koreksi	Kadar terkoreksi	Kadar Terdisolusi (%)	Berat Patch	dosis(mg)
5	80671	2	2.582107613	12.910538	0	12.9105	36.3073	111.2	35.559109
10	82998	2	2.676096038	13.38048	0.129105	13.5096	37.9919	111.2	35.559109
15	83083	2	2.67952922	13.397646	0.133805	13.5315	38.0534	111.2	35.559109
30	90931	2	2.996512957	14.982565	0.133976	15.1165	42.511	111.2	35.559109
60	95922	2	3.198101365	15.990507	0.149826	16.1403	45.3901	111.2	35.559109
120	100320	2	3.375738276	16.878691	0.159905	17.0386	47.9163	111.2	35.559109
180	112429	2	3.86482544	19.324127	0.168787	19.4929	54.8183	111.2	35.559109
240	120567	2	4.193522388	20.967612	0.193241	21.1609	59.509	111.2	35.559109
300	125953	2	4.411064998	22.055325	0.209676	22.265	62.6141	111.2	35.559109
360	130420	2	4.591488845	22.957444	0.220553	23.178	65.1816	111.2	35.559109
420	135790	2	4.808385209	24.041926	0.229574	24.2715	68.2568	111.2	35.559109
480	140477	2	4.997694941	24.988475	0.240419	25.2289	70.9492	111.2	35.559109

%Kadar terdisolusi Formula 2 Replikasi 2

Waktu n(menit)	Luas Area	Fp	Kadar (mg/100ml)	Kadar (mg/500ml)	Faktor Koreksi	Kadar terkoreksi	Kadar Terdisolusi (%)	Berat Patch	dosis (mg)
5	80321	2	2.567970979	12.839855	0	12.8399	33.7701	118.9	38.021385
10	81997	2	2.635665263	13.178326	0.131783	13.3101	35.0069	118.9	38.021385
15	82083	2	2.639138836	13.195694	0.131957	13.3277	35.053	118.9	38.021385
30	85931	2	2.794561035	13.972805	0.139728	14.1125	37.1174	118.9	38.021385
60	91922	2	3.036539828	15.182699	0.151827	15.3345	40.3313	118.9	38.021385
120	93320	2	3.093005585	15.465028	0.15465	15.6197	41.0813	118.9	38.021385
180	102429	2	3.460921596	17.304608	0.173046	17.4777	45.968	118.9	38.021385
240	110567	2	3.789618544	18.948093	0.189481	19.1376	50.3337	118.9	38.021385
300	120953	2	4.209113076	21.045565	0.210456	21.256	55.9054	118.9	38.021385
360	135489	2	4.796227704	23.981139	0.239811	24.2209	63.7035	118.9	38.021385
420	155790	2	5.616192897	28.080964	0.28081	28.3618	74.5943	118.9	38.021385
480	165478	2	6.007494941	30.037475	0.300375	30.3378	79.7915	118.9	38.021385

Waktu (menit)	Kadar terdisolusi (%)		Rata-rata kadar terdisolusi (%)	SD
	Replikasi 1	Replikasi 2		
5	36.30726	34	35.03867368	0.732
10	37.99191	35	36.4994082	1.6028
15	38.0534	35	36.55322125	1.104
30	42.51102	37	39.81419057	5
60	45.39015	40	42.86073418	5
120	47.91626	41	44.49878074	5
180	54.81834	46	50.39315016	7.73
240	59.50895	50	54.92133142	11.3
300	62.61406	56	59.25974725	13.771
360	65.1816	64	64.44254806	14.93
420	68.25677	75	71.42552148	14.25
480	70.94917	80	75.37035822	13.613

%Kadar Terdisolusi Formula 3

Waktu (menit)	Luas Area	Fp	Kadar (mg/100ml)	Kadar (mg/500ml)	Faktor Koreksi	Kadar terkoreksi	Kadar Terdisolusi (%)	Berat Patch	dosis(mg)
5	89321	2	2.931484438	14.657422	0	14.6574	33.2973	146.6	44.019893
10	92997	2	3.079959491	15.399797	0.153998	15.5538	35.3336	146.6	44.019893
15	95073	2	3.163809929	15.81905	0.15819	15.9772	36.2955	146.6	44.019893
30	99931	2	3.360026416	16.800132	0.168001	16.9681	38.5465	146.6	44.019893
60	131922	2	4.652155203	23.260776	0.232608	23.4934	53.3699	146.6	44.019893
120	133320	2	4.70862096	23.543105	0.235431	23.7785	54.0177	146.6	44.019893
180	143429	2	5.116927356	25.584637	0.255846	25.8405	58.7018	146.6	44.019893
240	155567	2	5.607185841	28.035929	0.280359	28.3163	64.3261	146.6	44.019893
300	160993	2	5.826344067	29.13172	0.291317	29.423	66.8403	146.6	44.019893
360	175499	2	6.412246983	32.061235	0.320612	32.3818	73.5618	146.6	44.019893
420	187590	2	6.90060712	34.503036	0.34503	34.8481	79.1644	146.6	44.019893
480	207778	2	7.7160082	38.580041	0.3858	38.9658	88.5187	146.6	44.019893

% kadar terdisolusi formula 3 replikasi 2

Waktu(menit)	Luas Area	Fp	Kadar (mg/100ml)	Kadar (mg/500ml)	Faktor Koreksi	Kadar terkoreksi	Kadar Terdisolusi (%)	Berat Patch	dosis (mg)
5	89921	2	2.955718669	14.778593	0	14.7786	49.6142	99.2	29.786994
10	93997	2	3.120349875	15.601749	0.156017	15.7578	52.9015	99.2	29.786994
15	95573	2	3.184005121	15.920026	0.1592	16.0792	53.9807	99.2	29.786994
30	98931	2	3.319636032	16.59818	0.165982	16.7642	56.2801	99.2	29.786994
60	122922	2	4.288641743	21.443209	0.214432	21.6576	72.7084	99.2	29.786994
120	123320	2	4.304717116	21.523586	0.215236	21.7388	72.9809	99.2	29.786994
180	133429	2	4.713023512	23.565118	0.235651	23.8008	79.9032	99.2	29.786994
240	145567	2	5.203281997	26.01641	0.260164	26.2766	88.2149	99.2	29.786994
300	150993	2	5.422440223	27.112201	0.271122	27.3833	91.9305	99.2	29.786994
360	155499	2	5.604439295	28.022196	0.280222	28.3024	95.016	99.2	29.786994
420	160590	2	5.810066742	29.050334	0.290503	29.3408	98.5022	99.2	29.786994
480	161778	2	5.858050519	29.290253	0.292903	29.5832	99.3157	99.2	29.786994

Waktu (menit)	Kadar terdisolusi (%)		Rata-rata kadar terdisolusi (%)	SD
	Replikasi 1	Replikasi 2		
5	33.29727	50	41.45575856	0.7362
10	35.33356	53	44.11753012	0.4872
15	36.2955	54	45.13809606	0.12
30	38.54651	56	47.41332568	0.774
60	53.36992	73	63.03915182	1.9405
120	54.0177	73	63.49931042	0.905
180	58.70183	80	69.30252713	0.16688
240	64.32612	88	76.27052045	0.3392
300	66.84032	92	79.38539371	2.092
360	73.56185	95	84.28893759	4.749
420	79.16436	99	88.83326616	4.639
480	88.51871	99	93.9171933	0.6512

% Kadar Terdisolusi Formula 4

Waktu(menit)	Luas Area	Fp	Kadar (mg/100ml)	Kadar (mg/500ml)	Faktor Koreksi	Kadar terkoreksi	Kadar Terdisolusi (%)	Berat Patch	dosis(mg)
5	85321	2	2.7699229	13.849615	0	13.8496	41.4037	100.8	33.450171
10	90997	2	2.999178722	14.995894	0.149959	15.1459	45.2788	100.8	33.450171
15	93073	2	3.08302916	15.415146	0.154151	15.5693	46.5447	100.8	33.450171
30	95931	2	3.198464879	15.992324	0.159923	16.1522	48.2875	100.8	33.450171
60	101922	2	3.440443671	17.202218	0.172022	17.3742	51.9407	100.8	33.450171
120	123320	2	4.304717116	21.523586	0.215236	21.7388	64.9887	100.8	33.450171
180	132429	2	4.672633128	23.363166	0.233632	23.5968	70.5431	100.8	33.450171
240	145567	2	5.203281997	26.01641	0.260164	26.2766	78.5544	100.8	33.450171
300	146993	2	5.260878686	26.304393	0.263044	26.5674	79.4239	100.8	33.450171
360	147499	2	5.28131622	26.406581	0.264066	26.6706	79.7325	100.8	33.450171
420	148590	2	5.325382129	26.626911	0.266269	26.8932	80.3977	100.8	33.450171
480	149778	2	5.373365906	26.86683	0.268668	27.1355	81.1221	100.8	33.450171

% Kadar Terdisolusi Formula 4 Replikasi 2

Waktu(menit)	Luas Area	Fp	Kadar (mg/100ml)	Kadar (mg/500ml)	Faktor Koreksi	Kadar terkoreksi	Kadar Terdisolusi (%)	Berat Patch	dosis(mg)
5	88321	2	2.891094054	14.45547	0	14.4555	44.0897	98.8	32.786477
10	91997	2	3.039569106	15.197846	0.151978	15.3498	46.8175	98.8	32.786477
15	94073	2	3.123419544	15.617098	0.156171	15.7733	48.1091	98.8	32.786477
30	96931	2	3.238855263	16.194276	0.161943	16.3562	49.8871	98.8	32.786477
60	121922	2	4.248251359	21.241257	0.212413	21.4537	65.4345	98.8	32.786477
120	143320	2	5.112524804	25.562624	0.255626	25.8183	78.7466	98.8	32.786477
180	153429	2	5.520831199	27.604156	0.276042	27.8802	85.0357	98.8	32.786477
240	165567	2	6.011089685	30.055448	0.300554	30.356	92.587	98.8	32.786477
300	166993	2	6.068686373	30.343432	0.303434	30.6469	93.4741	98.8	32.786477
360	167499	2	6.089123908	30.44562	0.304456	30.7501	93.7889	98.8	32.786477
420	168590	2	6.133189817	30.665949	0.306659	30.9726	94.4676	98.8	32.786477
480	169778	2	6.181173594	30.905868	0.309059	31.2149	95.2067	98.8	32.786477

Waktu (menit)	Kadar terdisolusi (%)		Rata-rata kadar terdisolusi (%)	SD
	Replikasi 1	Replikasi 2		
5	41.40372	44	42.74672547	0.1986
10	45.27885	47	46.04819751	0.1208
15	46.54475	48	47.32690723	0.53596
30	48.28749	50	49.08728891	0.172
60	51.94066	65	58.68758426	1.641
120	64.98867	79	71.8676568	0.233
180	70.54313	85	77.78939478	5.5
240	78.55438	93	85.57066987	5.1
300	79.42392	93	86.44901287	6
360	79.73247	94	86.76068296	4.8
420	80.39773	94	87.43268311	4.8
480	81.12215	95	88.16443029	0.49

%Kadar Terdisolusi Formula 5

Waktu(menit)	Luas Area	Fp	Kadar (mg/100ml)	Kadar (mg/500ml)	Faktor Koreksi	Kadar terkoreksi	Kadar Terdisolusi (%)	Berat Patch	dosis(mg)
5	85321	2	2.7699229	13.849615	0	13.8496	44.342	113.3	31.233632
10	86997	2	2.837617185	14.188086	0.141881	14.33	45.8799	113.3	31.233632
15	88083	2	2.881481142	14.407406	0.144074	14.5515	46.5891	113.3	31.233632
30	98931	2	3.319636032	16.59818	0.165982	16.7642	53.6734	113.3	31.233632
60	101922	2	3.440443671	17.202218	0.172022	17.3742	55.6267	113.3	31.233632
120	133320	2	4.70862096	23.543105	0.235431	23.7785	76.1312	113.3	31.233632
180	142429	2	5.076536971	25.382685	0.253827	25.6365	82.0798	113.3	31.233632
240	145567	2	5.203281997	26.01641	0.260164	26.2766	84.1291	113.3	31.233632
300	146953	2	5.25926307	26.296315	0.262963	26.5593	85.0342	113.3	31.233632
360	147489	2	5.280912316	26.404562	0.264046	26.6686	85.3843	113.3	31.233632
420	148590	2	5.325382129	26.626911	0.266269	26.8932	86.1033	113.3	31.233632
480	150478	2	5.401639175	27.008196	0.270082	27.2783	87.3362	113.3	31.233632

% Kadar Terdisolusi Formula 5 Replikasi 2

Waktu(menit)	Luas Area	Fp	Kadar (mg/100ml)	Kadar (mg/500ml)	Faktor Koreksi	Kadar terkoreksi	Kadar Terdisolusi (%)	Berat Patch	dosis(mg)
5	75321	2	2.366019057	11.830095	0	11.8301	37.6766	113.9	31.399035
10	85997	2	2.7972268	13.986134	0.139861	14.126	44.9886	113.9	31.399035
15	89073	2	2.921467623	14.607338	0.146073	14.7534	46.9868	113.9	31.399035
30	95931	2	3.198464879	15.992324	0.159923	16.1522	51.4419	113.9	31.399035
60	111922	2	3.844347515	19.221738	0.192217	19.414	61.8298	113.9	31.399035
120	143320	2	5.112524804	25.562624	0.255626	25.8183	82.2263	113.9	31.399035
180	152429	2	5.480440815	27.402204	0.274022	27.6762	88.1436	113.9	31.399035
240	155567	2	5.607185841	28.035929	0.280359	28.3163	90.182	113.9	31.399035
300	156993	2	5.664782529	28.323913	0.283239	28.6072	91.1084	113.9	31.399035
360	157499	2	5.685220064	28.4261	0.284261	28.7104	91.4371	113.9	31.399035
420	158590	2	5.729285973	28.64643	0.286464	28.9329	92.1458	113.9	31.399035
480	159778	2	5.77726975	28.886349	0.288863	29.1752	92.9175	113.9	31.399035

Waktu (menit)	Kadar terdisolusi (%)		Rata-rata kadar terdisolusi (%)	SD
	Replikasi 1	Replikasi 2		
5	44.34199	38	41.00930606	1.7426
10	45.87992	45	45.43427662	1.255
15	46.58914	47	46.78798414	2.19
30	53.67343	51	52.55764548	3.8
60	55.62671	62	58.7282438	6.7
120	76.13119	82	79.17872201	1.4
180	82.07983	88	85.11169246	2
240	84.1291	90	87.15556788	11.9
300	85.03423	91	88.07130431	13.2
360	85.38427	91	88.41067335	8.39
420	86.10327	92	89.12454029	6.1
480	87.33623	93	90.12688878	0.07

%Kadar Terdisolusi kontrol

Waktu (menit)	Luas Area	Fp	Kadar (mg/100ml)	Kadar (mg/500ml)	Faktor Koreksi	Kadar terkoreksi	Kadar Terdisolusi (%)	Berat Patch	dosis(mg)
5	16825	2	0.003343132	0.0167157	0	0.01672	0.05108	101.2	32.724333
10	17134	2	0.015823761	0.0791188	0.000791	0.07991	0.24419	101.2	32.724333
15	18100	2	0.054840872	0.2742044	0.002742	0.27695	0.8463	101.2	32.724333
30	19221	2	0.100118493	0.5005925	0.005006	0.5056	1.54502	101.2	32.724333
60	19311	2	0.103753628	0.5187681	0.005188	0.52396	1.60112	101.2	32.724333
120	19001	2	0.091232609	0.456163	0.004562	0.46072	1.4079	101.2	32.724333
180	18761	2	0.081538916	0.4076946	0.004077	0.41177	1.2583	101.2	32.724333
240	17689	2	0.038240424	0.1912021	0.001912	0.19311	0.59012	101.2	32.724333
300	16900	2	0.006372411	0.0318621	0.000319	0.03218	0.09834	101.2	32.724333
360	17890	2	0.046358892	0.2317945	0.002318	0.23411	0.71541	101.2	32.724333
420	18912	2	0.087637864	0.4381893	0.004382	0.44257	1.35242	101.2	32.724333
480	19801	2	0.123544916	0.6177246	0.006177	0.6239	1.90654	101.2	32.724333

%Kadar Terdisolusi kontrol replikasi 2

Waktu(menit)	Luas Area	Fp	Kadar (mg/100ml)	Kadar (mg/500ml)	Faktor Koreksi	Kadar terkoreksi	Kadar Terdisolusi (%)	Berat Patch	dosis (mg)
5	16825	2	0.003343132	0.0167157	0	0.01672	0.04956	104.3	33.726758
10	16903	2	0.006493582	0.0324679	0.000325	0.03279	0.09723	104.3	33.726758
15	17344	2	0.024305742	0.1215287	0.001215	0.12274	0.36394	104.3	33.726758
30	17801	2	0.042764147	0.2138207	0.002138	0.21596	0.64032	104.3	33.726758
60	19011	2	0.091636513	0.4581826	0.004582	0.46276	1.3721	104.3	33.726758
120	18031	2	0.052053936	0.2602697	0.002603	0.26287	0.77942	104.3	33.726758
180	18500	2	0.070997026	0.3549851	0.00355	0.35853	1.06306	104.3	33.726758
240	19712	2	0.119950172	0.5997509	0.005998	0.60575	1.79605	104.3	33.726758
300	19612	2	0.115911134	0.5795557	0.005796	0.58535	1.73557	104.3	33.726758
360	19670	2	0.118253776	0.5912689	0.005913	0.59718	1.77065	104.3	33.726758
420	19712	2	0.119950172	0.5997509	0.005998	0.60575	1.79605	104.3	33.726758
480	19812	2	0.12398921	0.6199461	0.006199	0.62615	1.85652	104.3	33.726758

Waktu (menit)	Kadar terdisolusi (%)		Rata-rata kadar terdisolusi (%)	SD
	Replikasi 1	Replikasi 2		
5	0.05108	0	0.050321119	0
10	0.244191	0	0.170710773	0.02
15	0.846301	0	0.605118841	0.07
30	1.545023	1	1.092671029	0.2
60	1.60112	1	1.486609283	0.21
120	1.407896	1	1.093657077	0.14
180	1.258304	1	1.160680873	0.07
240	0.590124	2	1.193085408	0.21
300	0.098339	2	0.916953932	0.14
360	0.715408	2	1.243026963	0.21
420	1.352422	2	1.574234616	0.07
480	1.906538	2	1.881531196	0.011

rata-rata

waktu	formula 1	formula 2	formula 3	formula 4	formula 5	kontrol
5	35.75733	35	35.58890571	42.746725	46.99768	0.05032
10	37.20046	36	39.98837713	46.048198	49.99187	0.17071
15	37.26202	37	41.29315397	47.326907	51.18163	0.60512
30	49.44802	40	46.15449454	49.087289	53.85859	1.09267
60	54.32781	43	52.3225051	58.687584	72.09686	1.48661
120	62.36758	44	70.34697816	71.867657	72.68262	1.09366
180	66.68816	50	75.5761305	77.789395	79.26692	1.16068
240	71.58505	55	79.69435432	85.57067	87.17277	1.19309
300	80.76874	61	83.05219367	86.449013	90.70689	0.91695
360	92.42963	69	85.89811148	86.760683	94.28623	1.24303
420	94.57277	76	90.6969902	87.432683	96.6243	1.57423
480	96.48987	82	95.01637009	88.16443	98.69902	1.88153

Lampiran 8 Contoh Cara perhitungan Keseragaman Kandungan

Formula	berat Patch	kadar tiap patch teoritis	Luas area	x(ppm)	x(mg/ml)	% kadar	kadar (mg)	Rata-rata (mg/patch)	SD	CV(%)
1	96.6	32.4671778	122284	21.3144	0.021314	98.47343	31.971545	31.79494	0.25	0.785
	95.9	31.8836364	121118	21.0789	0.021079	99.1679	31.618331			

Menghitung Kadar tiap patch secara teoritis :

$$= \frac{\text{Berat patch}}{\text{Berat patch rata - rata}} \times \text{Dosis yang dikehendaki}$$

$$= \frac{96.6}{95.21} \times 32 \text{ mg}$$

$$= 32,4671778 \text{ mg}$$

Menghitung x (ppm) :

Luas area = 122284

$$y = 16742,2295 + 4951,6736x$$

$$x = \frac{12284 - 16742,2295}{4951,6736} = 0,021314 \text{ mg/ml} = 21,3144 \text{ ppm}$$

Menghitung % kadar :

$$= \frac{\frac{\text{mg}}{\text{ml}} \times \text{faktor pembuatan} \times \text{faktor pengenceran}}{\text{kadar patch secara teoritis}} \times 100\%$$

$$= \frac{0.021314 \times 100 \times 15}{32,4671778} \times 100\% = 98,47343 \%$$

$$= \frac{98,47343 \%}{100\%} \times 32 \text{ mg} = 31,971545 \text{ mg}$$

Lampiran 9. Cara menghitung % kadar Terdisolusi

Jumlah Isosorbid dinitrat per patch yang dikehendaki 32 mg

Volume medium disolusi 500 ml

Volume pengambilan sampling 5 ml

Disolusi formula 1 replikasi Satu

Waktu (menit)	Luas Area	Fp	Kadar (mg/100ml)	Kadar (mg/500ml)	Faktor Koreksi	Kadar terkoreksi	Kadar Terdisolusi (%)	Berat Patch	dosisi (mg)
5	75671	2	2.380155691	11.900778	0	11.9008	34.6463	102.2	34.35
10	77998	2	2.474144116	12.370721	0.119008	12.4897	36.3609	102.2	34.35
15	78083	2	2.477577298	12.387886	0.123707	12.5116	36.4246	102.2	34.35
30	99313	2	3.335065159	16.675326	0.123879	16.7992	48.9069	102.2	34.35
60	101922	2	3.440443671	17.202218	0.166753	17.369	50.5657	102.2	34.35
120	115320	2	3.981594041	19.90797	0.172022	20.08	58.4582	102.2	34.35
180	122429	2	4.268729284	21.343646	0.19908	21.5427	62.7166	102.2	34.35
240	130567	2	4.597426232	22.987131	0.213436	23.2006	67.543	102.2	34.35
300	150953	2	5.420824608	27.104123	0.229871	27.334	79.5765	102.2	34.35
360	160420	2	5.803200377	29.016002	0.271041	29.287	85.2623	102.2	34.35
420	166790	2	6.060487125	30.302436	0.29016	30.5926	89.0631	102.2	34.35
480	167477	2	6.088235319	30.441177	0.303024	30.7442	89.5045	102.2	34.35

Menghitung Kadar (mg/100ml) :

Pada menit ke-5

Luas area : 75671

$$y = 16742,2295 + 4951,6736 x$$

x =

$$\frac{75671 - 16742,2295}{4951,6736} = 11,90078 \frac{\text{mg}}{\text{ml}} \times 10 \text{ ml} =$$

$$1,190078 \frac{\text{mg}}{100\text{ml}} \times 2 \text{ (faktor pengenceran)} = 2,380156 \text{ mg/100ml}$$

Kadar mg/500ml :

$$2,380156 \text{ mg/100ml} \times 5 = 11,900778 \text{ mg/500ml}$$

Faktor Koreksi :

$$\frac{\text{waktu (menit) sebelumnya}}{\text{volume disolusi (500ml)}} \times \text{Kadar pada menit sebelumnya} \left(\frac{\text{mg}}{500\text{ml}} \right)$$

$$\frac{0}{\text{volume disolusi (500ml)}} \times 0 \left(\frac{\text{mg}}{500\text{ml}} \right) = \text{factor koreksi pada menit ke-5 adalah } 0$$

Kadar Terkoreksi :

$$\text{Kadar mg/500ml} + \text{factor koreksi} = 11,900778 + 0 = 11,900778$$

% Kadar Terdisolusi :

$$\frac{\text{Kadar Terkoreksi}}{\text{dosis secara teoritis}} \times 100\%$$

$$\frac{11,900778}{34,35} \times 100\%$$

$$= 34,6463 \% \text{ (kadar terdisolusi)}$$

Lampiran 10. Nilai AUC

Waktu	Kadar terdisolusi	AUC
5	34.64631595	86.61579
10	36.36090501	177.5181
15	36.42456079	181.9637
30	48.90693112	639.9862
60	50.56567354	1492.089
120	58.45817256	3270.715
180	62.7165776	3635.243
240	67.54299301	3907.787
300	79.57649224	4413.585
360	94.08136656	5209.736
420	95.03068837	5673.362
480	97.20646126	5767.114
	AUC total	34455.71

FORMULA 1 (Replikasi 2)		
Waktu	Kadar terdisolusi	AUC
5	36.86835353	92.17088
10	38.04001249	187.2709
15	38.09947623	190.3487
30	49.98910969	660.6644
60	58.08995173	1621.186
120	66.27697899	3731.008
180	70.65974833	4108.102
240	75.62711645	4388.606
300	81.96098899	4727.643
360	90.77790116	5182.167
420	94.11486006	5546.783
480	95.77327358	5696.644
	AUC total	36132.59

Formula 2			Formula 2 Replikasi (2)		
waktu	Kadar terdisolusi	AUC	waktu	Kadar terdisolusi	AUC
5	36.30726012	90.76815	5	33.77009	84.42522
10	37.99191288	185.7479	10	35.0069	171.9425
15	38.05340299	190.1133	15	35.05304	175.1499
30	42.51102412	604.2332	30	37.11736	541.278
60	45.39014924	1318.518	60	40.33132	1161.73
120	47.91626423	2799.192	120	41.0813	2442.378
180	54.81834295	3082.038	180	45.96796	2611.478
240	59.50895293	3429.819	240	50.33371	2889.05
300	65.45372373	3748.88	300	55.90544	3187.174
360	73.72899635	4175.482	360	63.70349	3588.268
420	76.86095958	4517.699	420	74.59427	4148.933
480	84.09682389	4828.734	480	79.79154	4631.574
	AUC total	28971.22		Auc Total	25633.38

Formula 3			Formula 3 Replikasi 2		
Waktu	Kadar terdisolusi	AUC	Waktu	Kadar terdisolusi	AUC
5	33.29726899	83.24317	5	49.61425	124.0356
10	35.33356026	171.5771	10	52.9015	256.2894
15	36.2954997	179.0726	15	53.98069	267.2055
30	38.54651212	561.3151	30	56.28014	826.9562
60	53.36992473	1378.747	60	72.70838	1934.828
120	54.01770475	3221.629	120	72.98092	4370.679
180	58.70183085	3381.586	180	79.90322	4586.524
240	64.32611838	3690.838	240	88.21492	5043.544
300	66.84032039	3934.993	300	91.93047	5404.362
360	73.56184905	4212.065	360	95.01603	5608.395
420	79.16435856	4581.786	420	98.50217	5805.546
480	88.5187099	5030.492	480	99.31568	5934.536
	AUC Total	30427.34		AUC total	40162.9

Formula 4			Formula 4 Replikasi 2		
Waktu	Kadar terdisolusi	AUC	Waktu	Kadar terdisolusi	AUC
5	41.40371796	103.5093	5	44.08973	110.2243
10	45.27884924	216.7064	10	46.81755	227.2682
15	46.54474624	229.559	15	48.10907	237.3165
30	48.28748883	711.2418	30	49.88709	734.9712
60	51.94066268	1503.422	60	65.43451	1729.824
120	64.98867036	3507.88	120	78.74664	4325.434
180	70.54312881	4065.954	180	85.03566	4913.469
240	78.5543787	4472.925	240	92.58696	5328.679
300	79.42392066	4739.349	300	93.47411	5581.832
360	79.73246781	4774.692	360	93.7889	5617.89
420	80.39773449	4803.906	420	94.46763	5647.696
480	81.12214953	4845.597	480	95.20671	5690.23
	AUC total	33974.74		Auc Total	40144.83

Formula 5			Formula 5 Replikasi		
waktu	Kadar terdisolusi	AUC	waktu	Kadar terdisolusi	AUC
5	44.34199171	110.855	5	37.67662	94.19155
10	45.87992454	225.5548	10	44.98863	206.6631
15	46.58913756	231.1727	15	46.98683	229.9386
30	53.67343117	751.9693	30	51.44186	738.2152
60	55.6267057	1639.502	60	61.82978	1699.075
120	76.13119046	3952.737	120	82.22625	4321.681
180	82.07982896	4746.331	180	88.14356	5111.094
240	84.12910194	4986.268	240	90.18203	5349.768
300	85.03423016	5074.9	300	91.10838	5438.712
360	85.38426532	5112.555	360	91.43708	5476.364
420	86.1032741	5144.626	420	92.14581	5507.487
480	87.33623375	5203.185	480	92.91754	5551.901
	AUC total	37179.66		AUC total	39725.09

Kontrol			Kontrol replikasi 2		
Waktu	Kadar terdisolusi	AUC	Waktu	Kadar terdisolusi	AUC
5	0.051080221	0.127701	5	0.049562	0.123905
10	0.244191358	0.738179	10	0.09723	0.366981
15	0.846301145	2.726231	15	0.363937	1.152917
30	1.545022751	17.93493	30	0.640319	7.531919
60	1.601119936	47.19214	60	1.372099	30.18627
120	1.407896299	90.27049	120	0.779418	64.54549
180	1.258303805	79.986	180	1.063058	55.27427
240	0.590124	55.45283	240	1.796047	85.77314
300	0.098338677	20.65388	300	1.735569	105.9485
360	0.715407713	24.41239	360	1.770646	105.1865
420	1.352422416	62.0349	420	1.796047	107.0008
480	1.906537944	97.76881	480	1.856524	109.5771
	Auc TOT	499.2985		AUC total	672.6678

Cara menghitung AUC dari % kadar terdisolusi : Formula 1

Pada menit ke-5

$$\frac{(kadar\ terdisolusi + 0) \times (5 - 0)}{2}$$

Pada menit ke-10

$$\frac{(kadar\ terdisolusi\ pada\ menit\ ke - 10 + kadar\ terdisolusi\ pada\ menit\ ke - 5) \times (menit\ 10 - menit\ 5)}{2}$$

$$= \frac{(36,36090501 - 34,64631595) \times (10 - 5)}{2} = 177,5181$$

Lampiran 11. DE480%

	Berat patch	berat patch rata-rata	kadar rata-rata	kadar	kadar%	Y100	AUC total	DE480%
Formula 1								
r1	102.2	95.21	31.79494	34.12922	107.3417	51524	34455.71	66.87314
r2	99.3	95.21	31.79494	33.16077	104.2958	50061.97	36132.59	72.17573
Formula 2								
r1	111.2	100.07	28.52756	31.70045	111.1222	53338.66	28971.22	54.31562
r2	118.9	100.07	28.52756	33.89554	118.8168	57032.08	25633.38	44.94555
Formula 3								
r1	146.6	106.57	32.79733	45.11671	137.5622	66029.84	30427.34	46.0812
r2	99.2	106.57	32.79733	30.52918	93.08436	44680.49	40162.9	89.88912
Formula 4								
r1	100.8	96.43	30.68047	32.07084	104.5318	50175.26	33974.74	67.71214
r2	98.8	96.43	30.68047	31.43451	102.4577	49179.72	40144.83	81.62885
Formula 5								
r1	113.3	116.08	32.41443	31.63813	97.6051	46850.45	37179.66	79.35816
r2	113.9	116.08	32.41443	31.80568	98.12198	47098.55	39725.09	84.34461
Kontrol								
r1	101.2	98.96	0.325881	0.333257	102.2635	49086.5	499.2985	1.017181
r2	104.3	98.96	0.325881	0.343466	105.3961	50590.14	672.6678	1.329642

Menghitung kadar : formula 1

$$\frac{\text{berat patch}}{\text{berat patch rata - rata}} \times \text{kadar rata - rata}$$

$$\frac{102,2}{95,21} \times 31,79494 = 34,12922 \text{ mg}$$

Menghitung % kadar :

$$\frac{\text{kadar}}{\text{kadar rata - rata}} \times 100 \%$$

$$\frac{34,12922}{31,79494} \times 100\% = 107,3417 \%$$

Y₁₀₀ :

Kadar % x 480

= 107,3417% x 480

= 51524

DE₄₈₀ :

$$\frac{\text{AUC total}}{y100} \times 100 \%$$

$$\frac{34455,71}{51524} \times 100 \% = 66,87314$$

Lampiran 12. Kinetika pelepasan obat

Kinetika Orde NOL						
Orde Nol	Waktu vs % pelepasan					
	F1	F2	F3	F4	F5	Kontrol
5	35.75733	35.03867	41.45576	42.74673	41.00931	0.050321
10	37.20046	36.49941	44.11753	46.0482	45.43428	0.170711
15	37.26202	36.55322	45.1381	47.32691	46.78798	0.605119
30	49.44802	39.81419	47.41333	49.08729	52.55765	1.092671
60	54.32781	42.86073	63.03915	58.68758	58.72824	1.486609
120	62.36758	44.49878	63.49931	71.86766	79.17872	1.093657
180	66.68816	50.39315	69.30253	77.78939	85.11169	1.160681
240	71.58505	54.92133	76.27052	85.57067	87.15557	1.193085
300	80.76874	59.25975	79.38539	86.44901	88.0713	0.916954
360	84.99459	64.44255	84.28894	86.76068	88.41067	1.243027
420	88.53322	71.42552	88.83327	87.43268	89.12454	1.574235
480	89.58311	75.37036	93.91719	88.16443	90.12689	1.881531

	F1	F2	F3	F4	F5	Kontrol
a	42.026	35.8	46.97	50.4	51.85	0.6179
b	0.11	0.08	0.1	0.1	0.1	2.276×10^{-3}
r	0.96	0.9968	0.969	0.918	0.8834	0.723

Orde Satu	Waktu vs % log pelepasan					
	F1	F2	F3	F4	F5	Kontrol
5	1.553365	1.544548	1.617585	1.630903	1.612882	-1.29825
10	1.570548	1.562286	1.644611	1.663213	1.657384	-0.76774
15	1.571266	1.562926	1.654543	1.675108	1.670134	-0.21816
30	1.694149	1.600038	1.6759	1.690969	1.720636	0.038489
60	1.735022	1.63206	1.79961	1.768546	1.768847	0.172197
120	1.794959	1.648348	1.802769	1.856533	1.898608	0.038881
180	1.824049	1.702372	1.840749	1.89092	1.929989	0.064713
240	1.854822	1.739741	1.882357	1.932325	1.940295	0.076672
300	1.907243	1.77276	1.899741	1.93676	1.944834	-0.03765
360	1.929391	1.809173	1.925771	1.938323	1.946505	0.094481
420	1.947106	1.853853	1.948576	1.941674	1.949997	0.197069
480	1.952226	1.877201	1.972745	1.945293	1.954854	0.274511

	F1	F2	F3	F4	F5	Kontrol
a	1.6266	1.566	1.679	1.702	1.7	-0.41
b	8.1747 X 10(-4)	6.816 X 10(-4)	6.591 X 10(-4)	6.572 X 10(-4)	6.79 X10(-4)	1.69 X 10(-3)
r	0.82828	0.8924	0.8208	0.8927	0.8624	0.595

Highuci	Akar waktu vs % pelepasan			(akar waktu pelepasan)		
	F1	F2	F3	F4	F5	Kontrol
2.236	35.75733	35.03867	41.45576	42.74673	41.00931	0.050321
3.162	37.20046	36.49941	44.11753	46.0482	45.43428	0.170711
3.872	37.26202	36.55322	45.1381	47.32691	46.78798	0.605119
5.477	49.44802	39.81419	47.41333	49.08729	52.55765	1.092671
7.745	54.32781	42.86073	63.03915	58.68758	58.72824	1.486609
10.954	62.36758	44.49878	63.49931	71.86766	79.17872	1.093657
13.416	66.68816	50.39315	69.30253	77.78939	85.11169	1.160681
15.491	71.58505	54.92133	76.27052	85.57067	87.15557	1.193085
17.32	80.76874	59.25975	79.38539	86.44901	88.0713	0.916954
18.973	84.99459	64.44255	84.28894	86.76068	88.41067	1.243027
20.493	88.53322	71.42552	88.83327	87.43268	89.12454	1.574235
21.9	89.58311	75.37036	93.91719	88.16443	90.12689	1.881531
	F1	F2	F3	F4	F5	Kontrol
a	29.884	28.31	36.057	38.8815	39.35	0.35
b	2.835	1.923	2.58	2.56	2.69	0.058
r	0.9936	0.9759	0.9914	0.975	0.956	0.7741

Kosmyer pepas log waktu dan log % kadar pelepasan						
	F1	F2	F3	F4	F5	Kontrol
0.699	1.553365	1.544548	1.617585	1.630903	1.612882	-1.29825
1	1.570548	1.562286	1.644611	1.663213	1.657384	-0.76774
1.176	1.571266	1.562926	1.654543	1.675108	1.670134	-0.21816
1.477	1.694149	1.600038	1.6759	1.690969	1.720636	0.038489
1.778	1.735022	1.63206	1.79961	1.768546	1.768847	0.172197
2.08	1.794959	1.648348	1.802769	1.856533	1.898608	0.038881
2.255	1.824049	1.702372	1.840749	1.89092	1.929989	0.064713
2.38	1.854822	1.739741	1.882357	1.932325	1.940295	0.076672
2.477	1.907243	1.77276	1.899741	1.93676	1.944834	-0.03765
2.556	1.929391	1.809173	1.925771	1.938323	1.946505	0.094481
2.623	1.947106	1.853853	1.948576	1.941674	1.949997	0.197069
2.681	1.952226	1.877201	1.972745	1.945293	1.954854	0.274511

	F1	F2	F3	F4	F5	Kontrol
A	1.35947	1.38359	1.454787	1.472	1.45	-1.1742
B	0.216	0.159	0.181	0.18	0.193	0.548
R	0.9878	0.93697	0.98	0.9837	0.9842	0.822

Lampiran 13. Foto- Foto



