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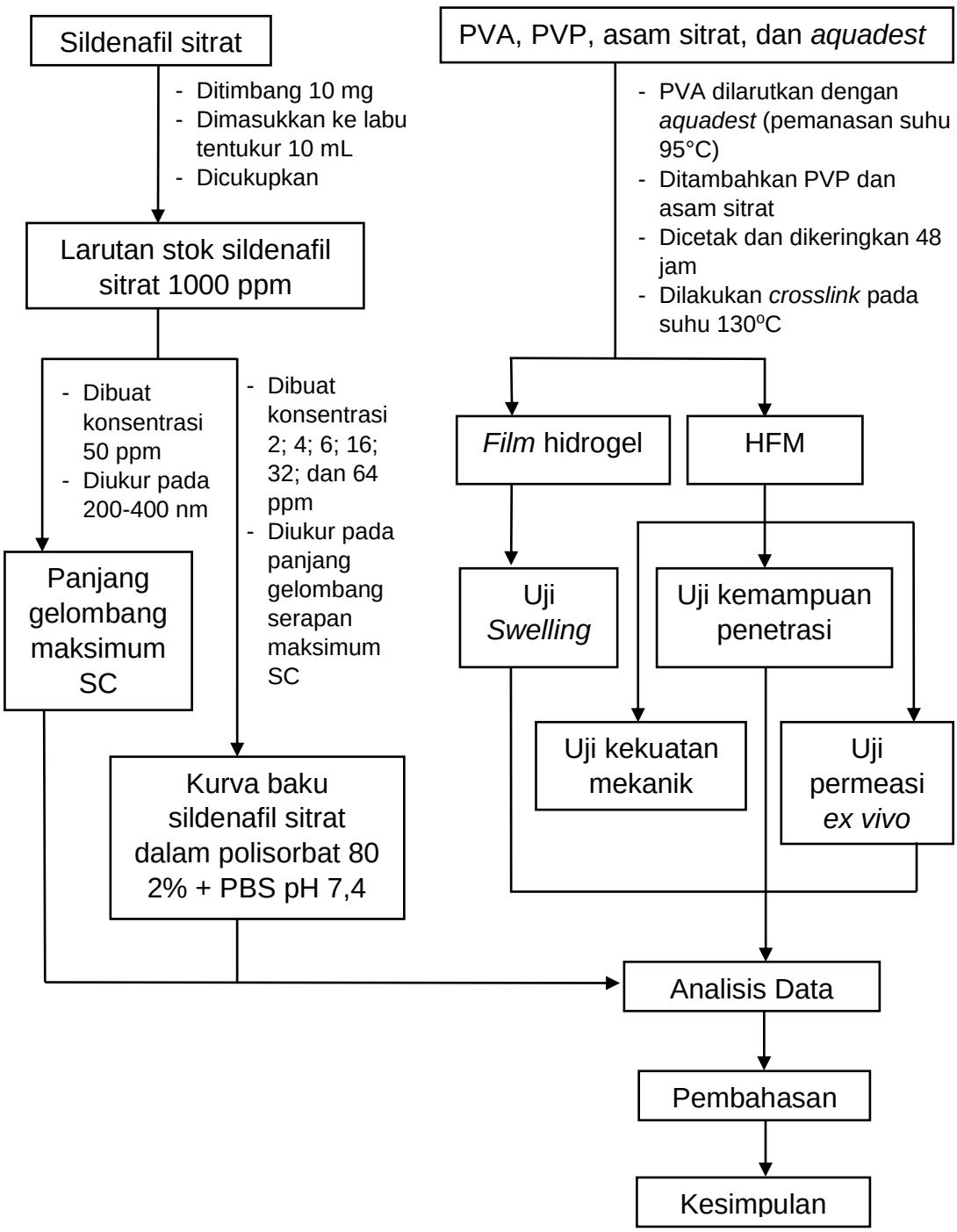
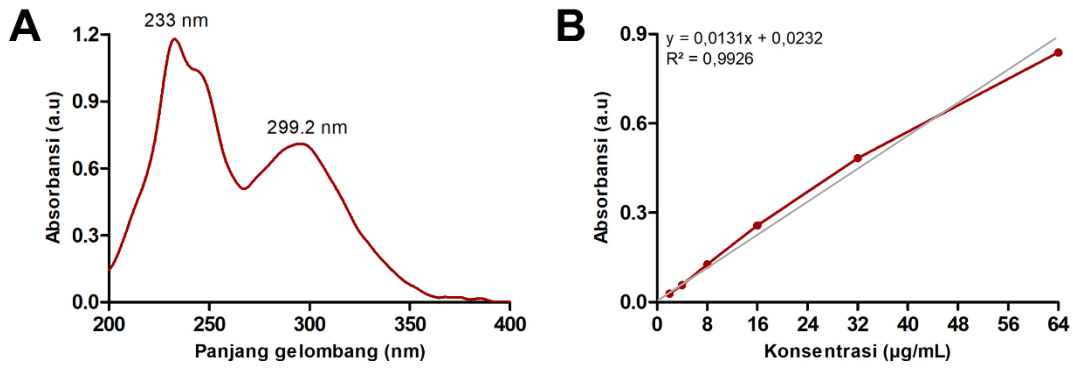
LAMPIRAN

Lampiran 1. Skema Kerja Penelitian



Lampiran 2. Panjang Gelombang Maksimum dan Kurva Baku



Gambar 15 Panjang gelombang maksimum sildenafil sitrat (a) dan kurva baku sildenafil sitrat (b) dalam PBS + polisorbat 80 2%

Tabel 3. Data absorbansi kurva baku sildenafil sitrat dalam PBS + polisorbat 80 2% (Rata-rata ± SD, n = 3)

Konsentrasi (PPM)	Absorbansi (a.u)				
	Replikasi 1	Replikasi 2	Replikasi 3	Rata-rata	SD
64	0.827	0.865	0.823	0.8383	0.0232
32	0.473	0.496	0.481	0.4833	0.0117
16	0.273	0.253	0.247	0.2577	0.0136
8	0.120	0.135	0.126	0.1270	0.0075
4	0.051	0.063	0.057	0.0570	0.0060
2	0.022	0.036	0.028	0.0287	0.0070

Lampiran 3. Tabel data hasil uji dan perhitungan

Lampiran 3.1 Uji *swelling*

Lampiran 3.1.1 Data hasil uji *swelling*

Tabel 4. Data hasil uji *swelling* film hidrogel (Rata-rata ± SD, n = 3)

Waktu (menit)	F1					F2					F3				
	Persentase Swelling (%)			Rata-rata	SD	Persentase Swelling (%)			Rata-rata	SD	Persentase Swelling (%)			Rata-rata	SD
0,5	20,00	20,00	20,00	20,00	0,00	22,73	28,57	23,81	25,04	3,11	20,00	26,67	33,33	26,67	6,67
1	40,00	32,00	32,00	34,67	4,62	36,36	42,86	42,86	40,69	3,75	40,00	33,33	40,00	37,78	3,85
2	52,00	52,00	52,00	52,00	0,00	54,55	61,90	66,67	61,04	6,11	66,67	66,67	66,67	66,67	0,00
3	64,00	64,00	64,00	64,00	0,00	68,18	76,19	76,19	73,52	4,62	80,00	80,00	80,00	80,00	0,00
4	68,00	68,00	68,00	68,00	0,00	90,91	100,00	100,00	96,97	5,25	100,00	93,33	100,00	97,78	3,85
5	84,00	84,00	80,00	82,67	2,31	109,09	119,05	119,05	115,73	5,75	106,67	106,67	106,67	106,67	0,00
10	116,00	116,00	112,00	114,67	2,31	140,91	152,38	152,38	148,56	6,62	153,33	153,33	146,67	151,11	3,85
15	132,00	132,00	132,00	132,00	0,00	168,18	176,19	176,19	173,52	4,62	180,00	180,00	180,00	180,00	0,00
30	180,00	184,00	180,00	181,33	2,31	213,64	233,33	228,57	225,18	10,28	220,00	220,00	220,00	220,00	0,00
60	256,00	252,00	252,00	253,33	2,31	281,82	295,24	295,24	290,76	7,75	273,33	273,33	273,33	273,33	0,00
120	340,00	340,00	336,00	338,67	2,31	350,00	371,43	371,43	364,29	12,37	326,67	326,67	326,67	326,67	0,00
180	388,00	344,00	384,00	372,00	24,33	381,82	404,76	404,76	397,11	13,25	353,33	353,33	353,33	353,33	0,00
240	420,00	416,00	416,00	417,33	2,31	404,55	428,57	419,05	417,39	12,10	346,67	360,00	353,33	353,33	6,67
300	444,00	440,00	436,00	440,00	4,00	418,18	442,86	438,10	433,04	13,09	360,00	360,00	360,00	360,00	0,00
360	452,00	452,00	448,00	450,67	2,31	418,18	442,86	442,86	434,63	14,25	360,00	360,00	360,00	360,00	0,00
420	464,00	464,00	460,00	462,67	2,31	418,18	447,62	447,62	437,81	17,00	360,00	366,67	366,67	364,44	3,85
480	472,00	468,00	464,00	468,00	4,00	422,73	447,62	447,62	439,32	14,37	366,67	366,67	373,33	368,89	3,85
1440	484,00	480,00	480,00	481,33	2,31	427,27	452,38	447,62	442,42	13,34	366,67	373,33	373,33	371,11	3,85

Lampiran 3.1.2 Perhitungan %*Swelling*

- Untuk F1 jam ke-24 replikasi pertama, bobot film hidrogel adalah 1,46 g dengan rata-rata bobot film hidrogel awal adalah 0,25 g.

  $$\%Swelling = \frac{(\text{Bobot film pada waktu ke-n} - \text{Bobot film awal})}{\text{Bobot film awal}} \times 100$$

  $$\%Swelling = \frac{(1{,}46\ \text{g} - 0{,}25\ \text{g})}{0{,}25\ \text{g}} \times 100$$

  $$\%Swelling = \frac{1{,}18\ \text{g}}{0{,}25\ \text{g}} \times 100$$

  $$\%Swelling = 484{,}00$$

- Untuk F2 jam ke-24 replikasi pertama, bobot film hidrogel adalah 1,16 g dengan rata-rata bobot film hidrogel awal adalah 0,22 g.

  $$\%Swelling = \frac{(\text{Bobot film pada waktu ke-n} - \text{Bobot film awal})}{\text{Bobot film awal}} \times 100$$

  $$\%Swelling = \frac{(1{,}16\ \text{g} - 0{,}22\ \text{g})}{0{,}22\ \text{g}} \times 100$$

  $$\%Swelling = \frac{0{,}94\ \text{g}}{0{,}22\ \text{g}} \times 100$$

  $$\%Swelling = 427{,}27$$

- Untuk F3 jam ke-24 replikasi pertama, bobot film hidrogel adalah 0,70 g dengan rata-rata bobot film hidrogel awal adalah 0,15 g.

  $$\%Swelling = \frac{(\text{Bobot film pada waktu ke-n} - \text{Bobot film awal})}{\text{Bobot film awal}} \times 100$$

  $$\%Swelling = \frac{(0{,}70\ \text{g} - 0{,}15\ \text{g})}{0{,}15\ \text{g}} \times 100$$

  $$\%Swelling = \frac{0{,}55\ \text{g}}{0{,}15\ \text{g}} \times 100$$

  $$\%Swelling = 366{,}67$$

Lampiran 3.2 Uji kemampuan penetrasi

Lampiran 3.2.1 Data hasil uji kemampuan penetrasi

Tabel 5. Data hasil uji kemampuan penetrasi HFM

Lapisan ke-	Jumlah lubang yang terbentuk								
	F1			F2			F3		
1	100	100	100	100	100	100	100	100	100
2	62	52	91	91	100	94	100	91	100
3	35	40	55	45	94	50	84	76	72
4	7	25	11	6	55	14	8	14	45
5	0	0	0	0	0	0	0	0	0
6	0	0	0	0	0	0	0	0	0
7	0	0	0	0	0	0	0	0	0
8	0	0	0	0	0	0	0	0	0

Lampiran 3.2.2 Perhitungan %Penetrasi

- Untuk F1 lapisan ke-4 replikasi pertama, jumlah lubang yang terbentuk adalah 7 dengan jumlah jarum pada HFM sebanyak 100.

  $$\%\text{Penetrasi} = \frac{\text{Jumlah lubang yang terbentuk}}{\text{Jumlah array pada HFM}} \times 100$$

  $$\%\text{Penetrasi} = \frac{7}{100} \times 100$$

  $$\%\text{Penetrasi} = 7$$

- Untuk F2 lapisan ke-4 replikasi pertama, jumlah lubang yang terbentuk adalah 6 dengan jumlah jarum pada HFM sebanyak 100.

  $$\%\text{Penetrasi} = \frac{\text{Jumlah lubang yang terbentuk}}{\text{Jumlah array pada HFM}} \times 100$$

  $$\%\text{Penetrasi} = \frac{6}{100} \times 100$$

  $$\%\text{Penetrasi} = 6$$

- Untuk F3 lapisan ke-4 replikasi pertama, jumlah lubang yang terbentuk adalah dengan jumlah jarum pada HFM sebanyak 100.

$$\%\text{Penetrasi} = \frac{\text{Jumlah lubang yang terbentuk}}{\text{Jumlah } \textit{array} \text{ pada HFM}} \times 100$$

$$\%\text{Penetrasi} = \frac{8}{100} \times 100$$

$$\%\text{Penetrasi} = 8$$

Lampiran 3.3 Uji kekuatan mekanik

Lampiran 3.3.1 Data hasil uji kekuatan mekanik

Tabel 6. Data hasil uji kekuatan mekanik HFM (Rata-rata ± SD, n = 3)

Formula	Tinggi HFM sebelum kompresi (µm)	Tinggi HFM setelah kompresi (µm)	%Kompresi	Rata-rata	SD
	684,05	661,27	3,33		
F1	641,45	620,66	3,24	5,12	3,18
	738,9	673,88	8,80		
	622,76	598,07	3,96		
F2	694,61	684,44	1,46	2,41	1,36
	637,29	625,89	1,79		
	671,37	650,39	3,12		
F3	670,04	669,34	0,10	1,92	1,60
	684,99	667,57	2,54		

Lampiran 3.3.2 Perhitungan %Kompresi

- Untuk F1 replikasi pertama, tinggi jarum sebelum kompresi adalah 684,05 µm dengan tinggi jarum setelah kompresi adalah 661,27 µm.

$$\%\text{Kompresi} = \frac{\text{Tinggi jarum sebelum kompresi - Tinggi jarum setelah kompresi}}{\text{Tinggi jarum sebelum kompresi}} \times 100$$

$$\%\text{Kompresi} = \frac{684,05 - 661,27}{684,05} \times 100$$

$$\%\text{Kompresi} = \frac{22,78}{684,05} \times 100$$

%Kompresi = 3,33

- Untuk F2 replikasi pertama, tinggi jarum sebelum kompresi adalah 622,76 µm dengan tinggi jarum setelah kompresi adalah 598,07 µm.

$$\%\text{Kompresi} = \frac{\text{Tinggi jarum sebelum kompresi - Tinggi jarum setelah kompresi}}{\text{Tinggi jarum sebelum kompresi}} \times 100$$

$$\%\text{Kompresi} = \frac{622,76 - 598,07}{622,76} \times 100$$

$$\%\text{Kompresi} = \frac{24,69}{622,76} \times 100$$

%Kompresi = 3,96

- Untuk F3 replikasi pertama, tinggi jarum sebelum kompresi adalah 671,37 µm dengan tinggi jarum setelah kompresi adalah 650,39 µm.

$$\%\text{Kompresi} = \frac{\text{Tinggi jarum sebelum kompresi - Tinggi jarum setelah kompresi}}{\text{Tinggi jarum sebelum kompresi}} \times 100$$

$$\%\text{Kompresi} = \frac{671,37 - 650,39}{671,37} \times 100$$

$$\%\text{Kompresi} = \frac{20,98}{671,37} \times 100$$

%Kompresi = 3,12

Lampiran 3.4 Uji permeasi *ex vivo*

Lampiran 3.4.1 Data hasil uji permeasi *ex vivo* F1

Tabel 7. Data hasil uji permeasi F1 (Rata-rata ± SD, n = 3)

Waktu (jam)	Absorbansi	Konsentrasi (µg/mL)	Faktor pengenceran	Dalam 13 mL (mg)	Faktor koreksi	Sildenafil sitrat yang terpermeasi (mg)	Rata-rata (mg)	SD
	0,246	17,01	1	0,22	0	0,22		
0,25	0,267	18,61	1	0,24	0	0,24	0,23	0,01
	0,277	19,37	1	0,25	0	0,25		
	0,667	49,15	2	1,27	0,01	1,30		
0,5	0,667	49,15	2	1,27	0,01	1,30	1,27	0,03
	0,638	46,93	2	1,22	0,01	1,23		
	0,721	53,27	2	1,38	0,06	1,45		
1	0,677	49,91	2	1,29	0,06	1,36	1,38	0,06
	0,657	48,38	2	1,25	0,06	1,32		
	0,515	37,54	4	1,95	0,11	2,06		
2	0,530	38,69	4	2,01	0,11	2,12	2,08	0,03
	0,515	37,54	4	1,95	0,11	2,06		
	0,769	56,93	4	2,96	0,15	3,11		
3	0,757	56,02	4	2,91	0,15	3,06	3,08	0,03
	0,757	56,02	4	2,91	0,15	3,06		
	0,577	42,27	8	4,39	0,21	4,61		
4	0,553	40,44	8	4,20	0,21	4,41	4,52	0,09
	0,568	41,59	8	4,32	0,20	4,53		

Lanjutan Tabel 7

Waktu (jam)	Absorbansi	Konsentrasi (µg/mL)	Faktor pengenceran	Dalam 13 mL (mg)	Faktor koreksi	Sildenafil sitrat yang terpermeasi (mg)	Rata-rata (mg)	SD
	0,757	56,02	8	5,82	0,25	6,08		
5	0,710	52,43	8	5,45	0,25	5,70	5,83	0,21
	0,713	52,66	8	5,47	0,24	5,72		
	0,515	37,54	16	7,80	0,31	8,12		
6	0,475	34,49	16	7,17	0,30	7,47	7,98	0,45
	0,530	38,69	16	8,04	0,30	8,34		
	0,593	43,50	16	9,04	0,34	9,40		
7	0,553	40,44	16	8,41	0,33	8,75	9,04	0,32
	0,568	41,59	16	8,65	0,34	9,00		
	0,601	44,11	16	9,17	0,39	9,56		
8	0,577	42,27	16	8,79	0,38	9,17	9,34	0,20
	0,585	42,89	16	8,92	0,38	9,30		
	0,722	53,34	16	11,10	0,43	11,53		
24	0,768	56,85	16	11,82	0,42	12,24	12,05	0,46
	0,777	57,54	16	11,96	0,42	12,39		

Lampiran 3.4.2 Perhitungan persentase permeasi sildenafil sitrat F1

Untuk F1 jam ke-2 replikasi pertama diperoleh absorbansi 0,515 dengan persamaan regresi y = 0,0131x + 0,0232 dan faktor pengenceran = 4.

$y = 0{,}0131x + 0{,}0232$

$x = \frac{y - 0{,}0232}{0{,}0131}$

$x = \frac{0{,}515 - 0{,}0232}{0{,}0131}$

$x = \frac{0{,}4918}{0{,}0131} = 37{,}54$ µg/mL

Konsentrasi dalam 13 mL = 37,54 µg/mL x 13 x 4 = 1952,08 µg/mL = 1,95 mg/mL

Faktor koreksi = $\frac{\text{Konsentrasi jam sebelumnya}}{1000}$ + faktor koreksi jam sebelumnya

Faktor koreksi = $\frac{53{,}27}{1000} + 0{,}06$

Faktor koreksi = 0,11

Jumlah obat yang terpermeasi = Konsentrasi dalam 13 mL + Faktor koreksi

Jumlah obat yang terpermeasi = 1,95 mg/mL + 0,11

Jumlah obat yang terpermeasi = 1,06 mg

Lampiran 3.4.3 Data hasil uji permeasi *ex vivo* F2

Tabel 8. Data hasil uji permeasi F2 (Rata-rata ± SD, n = 3)

Waktu (jam)	Absorbansi	Konsentrasi (µg/mL)	Faktor pengenceran	Dalam 13 mL (mg)	Faktor koreksi	Sildenafil sitrat yang terpermeasi (mg)	Rata-rata (mg)	SD
	0,206	13,95	1	0,18	0	0,18		
0,25	0,206	13,95	1	0,18	0	0,18	0,18	0,00
	0,206	13,95	1	0,18	0	0,18		
	0,426	30,75	2	0,80	0,01	0,81		
0,5	0,433	31,28	2	0,81	0,01	0,82	0,81	0,01
	0,426	30,75	2	0,80	0,01	0,81		
	0,505	36,78	2	0,95	0,04	1,00		
1	0,496	36,09	2	0,93	0,04	0,98	0,98	0,01
	0,488	35,48	2	0,92	0,04	0,96		
	0,532	38,84	2	1,01	0,07	1,08		
2	0,523	38,15	2	1,00	0,08	1,07	1,07	0,01
	0,514	37,47	2	0,97	0,08	1,05		
	0,672	49,53	2	1,28	0,12	1,40		
3	0,660	48,61	2	1,26	0,12	1,38	1,40	0,01
	0,665	48,99	2	1,27	0,11	1,40		
	0,523	38,15	4	1,98	0,17	2,15		
4	0,488	35,48	4	1,84	0,16	2,01	2,07	0,07
	0,496	36,09	4	1,87	0,16	2,04		

Lanjutan Tabel 8

Waktu (jam)	Absorbansi	Konsentrasi (µg/mL)	Faktor pengenceran	Dalam 13 mL (mg)	Faktor koreksi	Sildenafil sitrat yang terpermeasi (mg)	Rata-rata (mg)	SD
	0,685	50,52	4	2,62	0,21	2,83		
5	0,648	47,69	4	2,48	0,20	2,68	2,70	0,12
	0,624	45,86	4	2,38	0,20	2,58		
	0,757	56,02	4	2,91	0,25	3,17		
6	0,750	55,48	4	2,88	0,25	3,13	3,15	0,01
	0,757	56,02	4	2,91	0,24	3,16		
	0,334	23,73	16	4,93	0,31	5,25		
7	0,423	30,52	16	6,34	0,30	6,65	5,68	0,83
	0,329	23,34	16	4,85	0,30	5,16		
	0,523	38,15	16	7,93	0,33	8,27		
8	0,551	40,29	16	8,38	0,33	8,71	8,41	0,26
	0,523	38,15	16	7,93	0,32	8,26		
	0,755	55,86	16	11,62	0,37	12,00		
24	0,751	55,56	16	11,55	0,37	11,93	12,00	0,06
	0,760	56,24	16	11,70	0,36	12,06		

Lampiran 3.4.4 Perhitungan persentase permeasi sildenafil sitrat F2

Untuk F2 jam ke-2 replikasi pertama diperoleh absorbansi 0,532 dengan persamaan regresi y = 0,0131x + 0,0232 dan faktor pengenceran = 2.

$y = 0{,}0131x + 0{,}0232$

$x = \frac{y - 0{,}0232}{0{,}0131}$

$x = \frac{0{,}532 - 0{,}0232}{0{,}0131}$

$x = \frac{0{,}5088}{0{,}0131} = 38{,}84$ µg/mL

Konsentrasi dalam 13 mL = 38,84 µg/mL x 13 x 2 = 1009,84 µg/mL = 1,01 mg/mL

Faktor koreksi = $\frac{\text{Konsentrasi jam sebelumnya}}{1000}$ + faktor koreksi jam sebelumnya

Faktor koreksi = $\frac{36{,}78}{1000} + 0{,}04$

Faktor koreksi = 0,07

Jumlah obat yang terpermeasi = Konsentrasi dalam 13 mL + Faktor koreksi

Jumlah obat yang terpermeasi = 1,01 mg/mL + 0,07

Jumlah obat yang terpermeasi = 1,08 mg

Lampiran 3.4.5 Data hasil uji permeasi *ex vivo* F3

Tabel 9. Data hasil uji permeasi F3 (Rata-rata ± SD, n = 3)

Waktu (jam)	Absorbansi	Konsentrasi (µg/mL)	Faktor pengenceran	Dalam 13 mL (mg)	Faktor koreksi	Sildenafil sitrat yang terpermeasi (mg)	Rata-rata (mg)	SD
	0,141	9,00	1	0,11	0	0,11		
0,25	0,214	14,56	1	0,19	0	0,18	0,17	0,05
	0,243	16,78	1	0,22	0	0,21		
	0,410	29,53	2	0,76	0,01	0,77		
0,5	0,412	29,68	2	0,77	0,01	0,78	0,78	0,00
	0,406	29,22	2	0,76	0,01	0,77		
	0,432	31,21	2	0,81	0,03	0,85		
1	0,427	30,82	2	0,80	0,04	0,84	0,84	0,01
	0,417	30,06	2	0,78	0,04	0,82		
	0,450	32,58	2	0,84	0,06	0,90		
2	0,431	31,13	2	0,81	0,07	0,88	0,89	0,01
	0,428	30,90	2	0,80	0,07	0,88		
	0,572	41,89	2	1,09	0,10	1,19		
3	0,566	41,44	2	1,07	0,10	1,18	1,18	0,01
	0,556	40,67	2	1,05	0,10	1,16		
	0,677	49,91	2	1,30	0,14	1,44		
4	0,665	48,99	2	1,27	0,14	1,42	1,42	0,02
	0,653	48,08	2	1,25	0,14	1,40		

Lanjutan Tabel 9

Waktu (jam)	Absorbansi	Konsentrasi (µg/mL)	Faktor pengenceran	Dalam 13 mL (mg)	Faktor koreksi	Sildenafil sitrat yang terpermeasi (mg)	Rata-rata (mg)	SD
	0,471	34,18	4	1,77	0,19	1,97		
5	0,438	31,66	4	1,64	0,19	1,84	1,90	0,06
	0,454	32,89	4	1,71	0,19	1,90		
	0,496	36,09	4	1,87	0,22	2,10		
6	0,454	32,89	4	1,71	0,22	1,93	2,00	0,09
	0,461	33,42	4	1,73	0,22	1,96		
	0,566	41,44	4	2,15	0,26	2,41		
7	0,547	39,98	4	2,08	0,26	2,34	2,34	0,07
	0,528	38,53	4	2,00	0,26	2,26		
	0,678	49,98	4	2,60	0,30	2,90		
8	0,678	49,98	4	2,60	0,30	2,90	2,85	0,08
	0,641	47,16	4	2,45	0,30	2,75		
	0,762	56,40	8	5,86	0,35	6,22		
24	0,747	55,25	8	5,74	0,35	6,09	6,10	0,12
	0,732	54,11	8	5,62	0,34	5,97		

Lampiran 3.4.6 Perhitungan persentase permeasi sildenafil sitrat F3

Untuk F3 jam ke-2 replikasi pertama diperoleh absorbansi 0,450 dengan persamaan regresi y = 0,0131x + 0,0232 dan faktor pengenceran = 2.

$y = 0{,}0131x + 0{,}0232$

$x = \frac{y - 0{,}0232}{0{,}0131}$

$x = \frac{0{,}450 - 0{,}0232}{0{,}0131}$

$x = \frac{0{,}4268}{0{,}0131} = 32{,}58$ µg/mL

Konsentrasi dalam 13 mL = 32,58 µg/mL x 13 x 2 = 847,08 µg/mL = 0,84 mg/mL

Faktor koreksi = $\frac{\text{Konsentrasi jam sebelumnya}}{1000}$ + faktor koreksi jam sebelumnya

Faktor koreksi = $\frac{31{,}21}{1000} + 0{,}03$

Faktor koreksi = 0,06

Jumlah obat yang terpermeasi = Konsentrasi dalam 13 mL + Faktor koreksi

Jumlah obat yang terpermeasi = 0,84 mg/mL + 0,06

Jumlah obat yang terpermeasi = 0,9 mg

Lampiran 3.4.7 Data fluks permeasi *ex vivo* pada jam ke-24

Tabel 10. Data fluks permeasi *ex vivo* pada jam ke-24 (Rata-rata ± SD, n = 3)

Formula	Permeat (µg/cm^2)	Rata-rata	SD	Permeat kumulatif (µg /cm^2)	Rata-rata	SD	Fluks (µg /cm^2.jam)	Rata-rata	SD
	6303,82			31239,43			1301,64		
F1	6718,64	6607,55	266,17	30369,48	30919,60	478,50	1265,39	1287,32	19,95
	6800,18			31149,86			1297,91		
	6577,65			20519,88			855,00		
F2	6541,70	6580,65	40,53	21332,20	20709	553,42	888,84	862,87	23,06
	6622,60			20274,95			844,79		
	3320,28			10870,81			452,95		
F3	3252,87	3252,87	67,412	10588,24	10625,30	229,21	441,17	442,72	9,55
	3185,46			10416,90			434,03		

Lampiran 3.4.8 Perhitungan fluks

Untuk F1 jam ke-24 replikasi pertama, konsentrasi obat adalah 53,34 µg/mL, faktor pengenceran = 16, volume kompartemen reseptor = 13 mL, dan luas area membran difusi adalah 1,76 cm^2 (diameter = 1,5 cm).

$$\text{Permeat} = \frac{\text{Konsentrasi obat pada jam ke-n} \times \text{faktor pengenceran} \times \text{volume kompartemen reseptor}}{\text{Luas area membran difusi}}$$

$$\text{Permeat} = \frac{53{,}34\ \mu g/mL \times 16 \times 13\ mL}{1{,}76\ cm^2}$$

Permeat = 6303,82 µg/cm^2

Untuk permeat kumulatif, dilakukan penjumlahan dari permeat dari jam-jam sebelumnya hingga diperoleh nilai permeat kumulatif pada jam ke-24 replikasi pertama = 31239,43 µg/cm^2

$$\text{Fluks} = \frac{\text{Permeat kumulatif pada jam ke-n}}{\text{Waktu (jam)}}$$

$$\text{Fluks} = \frac{31239{,}43\ \mu g/cm^2}{24\ jam}$$

Fluks = 1301,64 µg/cm^2.jam

Lampiran 4. Hasil Uji Statistik Menggunakan *Software* IBM SPSS®

Lampiran 4.1 Uji *swelling*

Descriptives

	Formula			Statistic	Std. Error
Persentasi_Swelling	F1	Mean		472.99830	1.812373
		95% Confidence Interval for Mean	Lower Bound	465.20029	
			Upper Bound	480.79631	
		5% Trimmed Mean		.	
		Median		472.59143	
		Variance		9.854	
		Std. Deviation		3.139122	
		Minimum		470.082	
		Maximum		476.321	
		Range		6.239	
		Interquartile Range		.	
		Skewness		.573	1.225
		Kurtosis		.	.
	F2	Mean		435.54807	.523762
		95% Confidence Interval for Mean	Lower Bound	433.29450	
			Upper Bound	437.80163	
		5% Trimmed Mean		.	
		Median		435.03244	
		Variance		.823	
		Std. Deviation		.907182	
		Minimum		435.016	
		Maximum		436.596	
		Range		1.579	
		Interquartile Range		.	
		Skewness		1.731	1.225
		Kurtosis		.	.
	F3	Mean		357.91716	1.088417
		95% Confidence Interval for Mean	Lower Bound	353.23408	
			Upper Bound	362.60024	
		5% Trimmed Mean		.	
		Median		357.21717	
		Variance		3.554	

	Std. Deviation	1.885194	
	Minimum	356.482	
	Maximum	360.052	
	Range	3.570	
	Interquartile Range	.	
	Skewness	1.441	1.225
	Kurtosis	.	.

Tests of Normality

		Kolmogorov-Smirnov[a]			Shapiro-Wilk		
	Formula	Statistic	df	Sig.	Statistic	df	Sig.
Persentasi_	F1	.218	3	.	.987	3	.785
Swelling	F2	.382	3	.	.758	3	.017
	F3	.311	3	.	.897	3	.375

a. Lilliefors Significance Correction

Test Statistics[a,b]

	Persentasi_Swelling
Kruskal-Wallis H	7.200
df	2
Asymp. Sig.	.027

a. Kruskal Wallis Test

b. Grouping Variable: Variasi_WaktuPemanasan

Lampiran 4.2 Uji kemampuan penetrasi

Descriptives

	Formula			Statistic	Std. Error
Persentasi_ Kemampuan Penetrasi	F1	Mean		28.25000	1.993479
		95% Confidence Interval for Mean	Lower Bound	19.67275	
			Upper Bound	36.82725	
		5% Trimmed Mean		.	
		Median		27.12500	
		Variance		11.922	
		Std. Deviation		3.452807	
		Minimum		25.500	
		Maximum		32.125	
		Range		6.625	
		Interquartile Range		.	
		Skewness		1.311	1.225
		Kurtosis		.	.
	F2	Mean		35.37500	4.165208
		95% Confidence Interval for Mean	Lower Bound	17.45356	
			Upper Bound	53.29644	
		5% Trimmed Mean		.	
		Median		32.25000	
		Variance		52.047	
		Std. Deviation		7.214352	
		Minimum		30.250	
		Maximum		43.625	
		Range		13.375	
		Interquartile Range		.	
		Skewness		1.584	1.225
		Kurtosis		.	.
	F3	Mean		37.08333	1.331379
		95% Confidence Interval for Mean	Lower Bound	31.35487	
			Upper Bound	42.81179	
		5% Trimmed Mean		.	
		Median		36.50000	
		Variance		5.318	
		Std. Deviation		2.306016	

	Minimum	35.125	
	Maximum	39.625	
	Range	4.500	
	Interquartile Range	.	
	Skewness	1.065	1.225
	Kurtosis	.	.

Tests of Normality

		Kolmogorov-Smirnov[a]			Shapiro-Wilk		
	Formula	Statistic	df	Sig.	Statistic	df	Sig.
Persentasi_KemampuanPenetrasi	F1	.294	3	.	.920	3	.454
	F2	.334	3	.	.859	3	.266
	F3	.267	3	.	.952	3	.578

a. Lilliefors Significance Correction

ANOVA

Persentasi_KemampuanPenetrasi

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	131.712	2	65.856	2.851	.135
Within Groups	138.573	6	23.095		
Total	270.285	8			

Multiple Comparisons

Dependent Variable: Persentasi_KemampuanPenetrasi

						95% Confidence Interval	
	(I) Formula	(J) Formula	Mean Difference (I-J)	Std. Error	Sig.	Lower Bound	Upper Bound
Tukey HSD	F1	F2	-7.125000	3.923900	.243	-19.16460	4.91460
		F3	-8.833333	3.923900	.140	-20.87294	3.20627

	F2	F1	7.125000	3.923900	.243	-4.91460	19.16460
		F3	-1.708333	3.923900	.902	-13.74794	10.33127
	F3	F1	8.833333	3.923900	.140	-3.20627	20.87294
		F2	1.708333	3.923900	.902	-10.33127	13.74794
Games-Howell	F1	F2	-7.125000	4.617674	.395	-27.00150	12.75150
		F3	-8.833333	2.397192	.055	-17.98668	.32002
	F2	F1	7.125000	4.617674	.395	-12.75150	27.00150
		F3	-1.708333	4.372817	.922	-23.28440	19.86774
	F3	F1	8.833333	2.397192	.055	-.32002	17.98668
		F2	1.708333	4.372817	.922	-19.86774	23.28440

Lampiran 4.3 Uji kekuatan mekanik

Descriptives

	Formula			Statistic	Std. Error
Persentasi_Kompresi	F1	Mean		2.40633	.784259
		95% Confidence Interval for Mean	Lower Bound	-.96806	
			Upper Bound	5.78073	
		5% Trimmed Mean		.	
		Median		1.78700	
		Variance		1.845	
		Std. Deviation		1.358376	
		Minimum		1.468	
		Maximum		3.964	
		Range		2.496	
		Interquartile Range		.	
		Skewness		1.625	1.225
		Kurtosis		.	.
	F2	Mean		5.11767	1.838436
		95% Confidence Interval for Mean	Lower Bound	-2.79248	
			Upper Bound	13.02782	
		5% Trimmed Mean		.	
		Median		3.33400	
		Variance		10.140	
		Std. Deviation		3.184264	
		Minimum		3.225	
		Maximum		8.794	
		Range		5.569	
		Interquartile Range		.	
		Skewness		1.730	1.225
		Kurtosis		.	.
	F3	Mean		1.91067	.917786
		95% Confidence Interval for Mean	Lower Bound	-2.03825	
			Upper Bound	5.85958	
		5% Trimmed Mean		.	
		Median		2.53300	
		Variance		2.527	
		Std. Deviation		1.589652	

	Minimum	.104	
	Maximum	3.095	
	Range	2.991	
	Interquartile Range	.	
	Skewness	-1.492	1.225
	Kurtosis	.	.

Tests of Normality

		Kolmogorov-Smirnov[a]			Shapiro-Wilk		
	Formula	Statistic	df	Sig.	Statistic	df	Sig.
Persentasi_Kompresi	F1	.342	3	.	.844	3	.225
	F2	.379	3	.	.765	3	.033
	F3	.319	3	.	.885	3	.339

a. Lilliefors Significance Correction

Test Statistics[a,b]

	Persentasi_Kompresi
Kruskal-Wallis H	3.467
df	2
Asymp. Sig.	.177

a. Kruskal Wallis Test

b. Grouping Variable: Variasi_WaktuPemanasan

Lampiran 4.4 Uji permeasi *ex vivo*

Descriptives

	Formula			Statistic	Std. Error
Permeasi (%)	F1	Mean		24.11696	.532425
		95% Confidence Interval for Mean	Lower Bound	21.82612	
			Upper Bound	26.40779	
		5% Trimmed Mean		.	
		Median		24.49655	
		Variance		.850	
		Std. Deviation		.922186	
		Minimum		23.066	
		Maximum		24.789	
		Range		1.723	
		Interquartile Range		.	
		Skewness		-1.538	1.225
		Kurtosis		.	.
	F2	Mean		23.99614	.075926
		95% Confidence Interval for Mean	Lower Bound	23.66946	
			Upper Bound	24.32283	
		5% Trimmed Mean		.	
		Median		23.99166	
		Variance		.017	
		Std. Deviation		.131508	
		Minimum		23.867	
		Maximum		24.130	
		Range		.263	
		Interquartile Range		.	
		Skewness		.153	1.225
		Kurtosis		.	.
	F3	Mean		12.19550	.142179
		95% Confidence Interval for Mean	Lower Bound	11.58376	
			Upper Bound	12.80725	
		5% Trimmed Mean		.	
		Median		12.19469	
		Variance		.061	
		Std. Deviation		.246261	

	Minimum	11.950	
	Maximum	12.442	
	Range	.493	
	Interquartile Range	.	
	Skewness	.015	1.225
	Kurtosis	.	.

Tests of Normality

		Kolmogorov-Smirnov[a]			Shapiro-Wilk		
	Formula	Statistic	df	Sig.	Statistic	df	Sig.
Permeasi (%)	F1	.326	3	.	.873	3	.304
	F2	.180	3	.	.999	3	.944
	F3	.175	3	.	1.000	3	.995

a. Lilliefors Significance Correction

ANOVA

Permeasi (%)

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	281.391	2	140.695	454.655	.000
Within Groups	1.857	6	.309		
Total	283.248	8			

Multiple Comparisons

Dependent Variable: Permeasi (%)

	(I) Formula	(J) Formula	Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval Lower Bound	95% Confidence Interval Upper Bound
Tukey HSD	F1	F2	.120814	.454207	.962	-1.27282	1.51444
		F3	11.921455*	.454207	.000	10.52782	13.31509
	F2	F1	-.120814	.454207	.962	-1.51444	1.27282
		F3	11.800641*	.454207	.000	10.40701	13.19427
	F3	F1	-11.921455*	.454207	.000	-13.31509	-10.52782

		F2	-11.800641*	.454207	.000	-13.19427	-10.40701
Games-Howell	F1	F2	.120814	.537811	.973	-2.91753	3.15916
		F3	11.921455*	.551081	.002	9.07560	14.76731
	F2	F1	-.120814	.537811	.973	-3.15916	2.91753
		F3	11.800641*	.161182	.000	11.13497	12.46631
	F3	F1	-11.921455*	.551081	.002	-14.76731	-9.07560
		F2	-11.800641*	.161182	.000	-12.46631	-11.13497

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

Lampiran 4.5 Fluks permeasi *ex vivo*

Descriptives

	Formula			Statistic	Std. Error
Fluks	F1	Mean		1287.32054	11.518346
		95% Confidence Interval for Mean	Lower Bound	1237.76110	
			Upper Bound	1336.87998	
		5% Trimmed Mean		.	
		Median		1296.87843	
		Variance		398.017	
		Std. Deviation		19.950360	
		Minimum		1264.389	
		Maximum		1300.694	
		Range		36.304	
		Interquartile Range		.	
		Skewness		-1.661	1.225
		Kurtosis		.	.
	F2	Mean		862.87534	13.313184
		95% Confidence Interval for Mean	Lower Bound	805.59334	
			Upper Bound	920.15735	
		5% Trimmed Mean		.	
		Median		854.99496	
		Variance		531.723	
		Std. Deviation		23.059111	
		Minimum		844.789	
		Maximum		888.842	
		Range		44.052	
		Interquartile Range		.	
		Skewness		1.358	1.225
		Kurtosis		.	.
	F3	Mean		442.72144	5.514060
		95% Confidence Interval for Mean	Lower Bound	418.99636	
			Upper Bound	466.44653	
		5% Trimmed Mean		.	
		Median		441.17658	
		Variance		91.215	
		Std. Deviation		9.550632	

	Minimum	434.037	
	Maximum	452.950	
	Range	18.913	
	Interquartile Range	.	
	Skewness	.709	1.225
	Kurtosis	.	.

Tests of Normality

		Kolmogorov-Smirnov[a]			Shapiro-Wilk		
	Formula	Statistic	df	Sig.	Statistic	df	Sig.
Fluks	F1	.351	3	.	.828	3	.183
	F2	.300	3	.	.912	3	.426
	F3	.231	3	.	.980	3	.732

a. Lilliefors Significance Correction

ANOVA

Fluks

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	1070030.665	2	535015.333	1572.104	.000
Within Groups	2041.908	6	340.318		
Total	1072072.573	8			

Multiple Comparisons

Dependent Variable: Fluks

	(I) Formula	(J) Formula	Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval Lower Bound	Upper Bound
Tukey HSD	F1	F2	424.445198*	15.062492	.000	378.22934	470.66106
		F3	844.599099*	15.062492	.000	798.38324	890.81496
	F2	F1	-424.445198*	15.062492	.000	-470.66106	-378.22934

		F3	420.153901*	15.062492	.000	373.93804	466.36976
	F3	F1	-844.599099*	15.062492	.000	-890.81496	-798.38324
		F2	-420.153901*	15.062492	.000	-466.36976	-373.93804
Games-Howell	F1	F2	424.445198*	17.604350	.000	361.09781	487.79258
		F3	844.599099*	12.770166	.000	789.63576	899.56244
	F2	F1	-424.445198*	17.604350	.000	-487.79258	-361.09781
		F3	420.153901*	14.409917	.000	354.73562	485.57218
	F3	F1	-844.599099*	12.770166	.000	-899.56244	-789.63576
		F2	-420.153901*	14.409917	.000	-485.57218	-354.73562

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

Lampiran 5. Hasil Uji Kinetika Pelepasan Obat Menggunakan *add-ins* Microsoft Excel (Ddsolver®)

Lampiran 5.1 Data model kinetika pada zam ke-24

Lampiran 5.1.1 *Zero order*

DD*Solver 1.0** ***Dissolution Data Modeling of Zero-order Model

Time Unit	h	Analyst	Andi Maqhfirah Nurul Fitri
Model	Zero-order	Date	2022-11-3
Equation	F=k0*t	Time	16:20:33

Time (h)	No.1 F(%)	Mean	SD	RSD(%)
0.5	2.55	2.55		
1	2.76	2.76		
2	4.18	4.18		
3	6.17	6.17		
4	9.04	9.04		
5	11.68	11.68		
6	15.97	15.97		
7	18.09	18.09		
8	18.70	18.70		
24	24.12	24.12		

Best-fit Values

Parameter	No.1	Mean	SD	RSD(%)
k0	1.379	1.379		

Secondary Parameter

Parameter	No.1	Mean	SD	RSD(%)
T25	18.124	18.124		
T50	36.248	36.248		
T75	54.372	54.372		
T80	57.997	57.997		
T90	65.246	65.246		

Goodness of Fit

Parameter	No.1
N_observed	10
DF	9
R_obs-pre	0.8438
Rsqr	0.3896
Rsqr_adj	0.3896
MSE	35.1750
MSE_root	5.9308
Weighting	1

SS	316.5746
WSS	316.5746
AIC	59.5756
MSC	0.2936

Lampiran 5.1.2 *First order*

DDSolver 1.0	***Dissolution Data Modeling of First-order Model***		
Time Unit	h	Analyst	Andi Maqhfirah Nurul Fitri
Model	First-order	Date	2022-11-3
Equation	F=100*[1-Exp(-k1*t)]	Time	16:21:47

Time (h)	No.1 F(%)	Mean	SD	RSD(%)
0.5	2.55	2.55		
1	2.76	2.76		
2	4.18	4.18		
3	6.17	6.17		
4	9.04	9.04		
5	11.68	11.68		
6	15.97	15.97		
7	18.09	18.09		
8	18.70	18.70		
24	24.12	24.12		

Best-fit Values

Parameter	No.1	Mean	SD	RSD(%)
k1	0.017	0.017		

Secondary Parameter

Parameter	No.1	Mean	SD	RSD(%)
T25	16.898	16.898		
T50	40.715	40.715		
T75	81.430	81.430		
T80	94.538	94.538		
T90	135.253	135.253		

Goodness of Fit

Parameter	No.1
N_observed	10
DF	9
R_obs-pre	0.8724
Rsqr	0.5466
Rsqr_adj	0.5466
MSE	26.1245
MSE_root	5.1112
Weighting	1

SS	235.1207
WSS	235.1207
AIC	56.6010
MSC	0.5910

Lampiran 5.1.3 *Higuchi*

DDSolver 1.0	***Dissolution Data Modeling of Higuchi Model***		
Time Unit	h	Analyst	Andi Maqhfirah Nurul Fitri
Model	Higuchi	Date	2022-11-3
Equation	F=kH*t^0.5	Time	16:23:44

Time (h)	No.1 F(%)	Mean	SD	RSD(%)
0.5	2.55	2.55		
1	2.76	2.76		
2	4.18	4.18		
3	6.17	6.17		
4	9.04	9.04		
5	11.68	11.68		
6	15.97	15.97		
7	18.09	18.09		
8	18.70	18.70		
24	24.12	24.12		

Best-fit Values

Parameter	No.1	Mean	SD	RSD(%)
kH	5.345	5.345		

Secondary Parameter

Parameter	No.1	Mean	SD	RSD(%)
T25	21.879	21.879		
T50	87.516	87.516		
T75	196.911	196.911		
T80	224.041	224.041		
T90	283.552	283.552		

Goodness of Fit

Parameter	No.1
N_observed	10
DF	9
R_obs-pre	0.9345
Rsqr	0.8594
Rsqr_adj	0.8594
MSE	8.1006
MSE_root	2.8461
Weighting	1

SS	72.9051
WSS	72.9051
AIC	44.8916
MSC	1.7620

Lampiran 5.1.4 *Korsmeyers-peppas*

DDSolver 1.0 ***Dissolution Data Modeling of Korsmeyer-Peppas Model***

Time Unit	h	Analyst	Andi Maqhfirah Nurul Fitri
Model	Korsmeyer-Peppas	Date	2022-11-3
Equation	F=kKP*t^n	Time	16:25:00

Time (h)	No.1 F(%)	Mean	SD	RSD(%)
0.5	2.55	2.55		
1	2.76	2.76		
2	4.18	4.18		
3	6.17	6.17		
4	9.04	9.04		
5	11.68	11.68		
6	15.97	15.97		
7	18.09	18.09		
8	18.70	18.70		
24	24.12	24.12		

Best-fit Values

Parameter	No.1	Mean	SD	RSD(%)
kKP	5.037	5.037		
n	0.526	0.526		

Secondary Parameter

Parameter	No.1	Mean	SD	RSD(%)
T25	20.975	20.975		
T50	78.260	78.260		
T75	169.060	169.060		
T80	191.110	191.110		
T90	239.030	239.030		

Goodness of Fit

Parameter	No.1
N_observed	10
DF	8
R_obs-pre	0.9313
Rsqr	0.8615
Rsqr_adj	0.8442
MSE	8.9775
MSE_root	2.9963

Weighting	1
SS	71.8203
WSS	71.8203
AIC	46.7417
MSC	1.5770

Lampiran 5.1.5 *Hixson-Crowell*

DDSolver 1.0 ***Dissolution Data Modeling of Hixson-Crowell Model***

Time Unit	h	Analyst	Andi Maqhfirah Nurul Fitri
Model	Hixson-Crowell	Date	2022-11-3
Equation	F=100*[1-(1-kHC*t)^3]	Time	16:25:51

Time (h)	No.1 F(%)	Mean	SD	RSD(%)
0.5	2.55	2.55		
1	2.76	2.76		
2	4.18	4.18		
3	6.17	6.17		
4	9.04	9.04		
5	11.68	11.68		
6	15.97	15.97		
7	18.09	18.09		
8	18.70	18.70		
24	24.12	24.12		

Best-fit Values

Parameter	No.1	Mean	SD	RSD(%)
kHC	0.005	0.005		

Secondary Parameter

Parameter	No.1	Mean	SD	RSD(%)
T25	17.263	17.263		
T50	38.948	38.948		
T75	69.861	69.861		
T80	78.386	78.386		
T90	101.163	101.163		

Goodness of Fit

Parameter	No.1
N_observed	10
DF	9
R_obs-pre	0.8629
Rsqr	0.4961
Rsqr_adj	0.4961
MSE	29.0356

MSE_root	5.3885
Weighting	1
SS	261.3203
WSS	261.3203
AIC	57.6575
MSC	0.4854

Lampiran 5.2 Data model kinetika pada zam ke-8

Lampiran 5.2.1 *Zero order*

DDSolver 1.0	***Dissolution Data Modeling of Zero-order Model***		
Time Unit	h	Analyst	Andi Maqhfirah Nurul Fitri
Model	Zero-order	Date	2022-11-3
Equation	F=k0*t	Time	16:39:09

Time (h)	No.1 F(%)	Mean	SD	RSD(%)
0.5	2.55	2.55		
1	2.76	2.76		
2	4.18	4.18		
3	6.17	6.17		
4	9.04	9.04		
5	11.68	11.68		
6	15.97	15.97		
7	18.09	18.09		
8	18.70	18.70		

Best-fit Values

Parameter	No.1	Mean	SD	RSD(%)
k0	2.436	2.436		

Secondary Parameter

Parameter	No.1	Mean	SD	RSD(%)
T25	10.265	10.265		
T50	20.529	20.529		
T75	30.794	30.794		
T80	32.847	32.847		
T90	36.953	36.953		

Goodness of Fit

Parameter	No.1
N_observed	9
DF	8
R_obs-pre	0.9882
Rsqr	0.9764
Rsqr_adj	0.9764

MSE	0.9942
MSE_root	0.9971
Weighting	1
SS	7.9539
WSS	7.9539
AIC	20.6629
MSC	3.5236

Lampiran 5.2.2 *First order*

DDSolver 1.0	***Dissolution Data Modeling of First-order Model***		
Time Unit	h	Analyst	Andi Maqhfirah Nurul Fitri
Model	First-order	Date	2022-11-3
Equation	F=100*[1-Exp(-k1*t)]	Time	16:40:21

Time (h)	No.1 F(%)	Mean	SD	RSD(%)
0.5	2.55	2.55		
1	2.76	2.76		
2	4.18	4.18		
3	6.17	6.17		
4	9.04	9.04		
5	11.68	11.68		
6	15.97	15.97		
7	18.09	18.09		
8	18.70	18.70		

Best-fit Values

Parameter	No.1	Mean	SD	RSD(%)
k1	0.026	0.026		

Secondary Parameter

Parameter	No.1	Mean	SD	RSD(%)
T25	10.898	10.898		
T50	26.257	26.257		
T75	52.514	52.514		
T80	60.967	60.967		
T90	87.224	87.224		

Goodness of Fit

Parameter	No.1
N_observed	9
DF	8
R_obs-pre	0.9862
Rsqr	0.9722
Rsqr_adj	0.9722
MSE	1.1713

MSE_root	1.0822
Weighting	1
SS	9.3700
WSS	9.3700
AIC	22.1377
MSC	3.3597

Lampiran 5.2.3 *Higuchi*

DDSolver 1.0	***Dissolution Data Modeling of Higuchi Model***		
Time Unit	h	Analyst	Andi Maqhfirah Nurul Fitri
Model	Higuchi	Date	2022-11-3
Equation	F=kH*t^0.5	Time	16:41:17

Time (h)	No.1 F(%)	Mean	SD	RSD(%)
0.5	2.55	2.55		
1	2.76	2.76		
2	4.18	4.18		
3	6.17	6.17		
4	9.04	9.04		
5	11.68	11.68		
6	15.97	15.97		
7	18.09	18.09		
8	18.70	18.70		

Best-fit Values

Parameter	No.1	Mean	SD	RSD(%)
kH	5.622	5.622		

Secondary Parameter

Parameter	No.1	Mean	SD	RSD(%)
T25	19.773	19.773		
T50	79.093	79.093		
T75	177.959	177.959		
T80	202.478	202.478		
T90	256.261	256.261		

Goodness of Fit

Parameter	No.1
N_observed	9
DF	8
R_obs-pre	0.9604
Rsqr	0.8046
Rsqr_adj	0.8046
MSE	8.2281
MSE_root	2.8685

Weighting	1
SS	65.8248
WSS	65.8248
AIC	39.6830
MSC	1.4102

Lampiran 5.2.4 *Korsmeyers-peppas*

DDSolver 1.0 ***Dissolution Data Modeling of Korsmeyer-Peppas Model***

Time Unit	h	Analyst	Andi Maqhfirah Nurul Fitri
Model	Korsmeyer-Peppas	Date	2022-11-3
Equation	F=kKP*t^n	Time	16:42:08

Time (h)	No.1 F(%)	Mean	SD	RSD(%)
0.5	2.55	2.55		
1	2.76	2.76		
2	4.18	4.18		
3	6.17	6.17		
4	9.04	9.04		
5	11.68	11.68		
6	15.97	15.97		
7	18.09	18.09		
8	18.70	18.70		

Best-fit Values

Parameter	No.1	Mean	SD	RSD(%)
kKP	2.238	2.238		
n	1.047	1.047		

Secondary Parameter

Parameter	No.1	Mean	SD	RSD(%)
T25	10.026	10.026		
T50	19.440	19.440		
T75	28.635	28.635		
T80	30.456	30.456		
T90	34.082	34.082		

Goodness of Fit

Parameter	No.1
N_observed	9
DF	7
R_obs-pre	0.9891
Rsqr	0.9772
Rsqr_adj	0.9740
MSE	1.0952
MSE_root	1.0465

Weighting	1
SS	7.6662
WSS	7.6662
AIC	22.3314
MSC	3.3382

Lampiran 5.2.5 *Hixson-crowell*

DDSolver 1.0 ***Dissolution Data Modeling of Hixson-Crowell Model***

Time Unit	h	Analyst	Andi Maqhfirah Nurul Fitri
Model	Hixson-Crowell	Date	2022-11-3
Equation	F=100*[1-(1-kHC*t)^3]	Time	16:43:05

Time (h)	No.1 F(%)	Mean	SD	RSD(%)
0.5	2.55	2.55		
1	2.76	2.76		
2	4.18	4.18		
3	6.17	6.17		
4	9.04	9.04		
5	11.68	11.68		
6	15.97	15.97		
7	18.09	18.09		
8	18.70	18.70		

Best-fit Values

Parameter	No.1	Mean	SD	RSD(%)
kHC	0.009	0.009		

Secondary Parameter

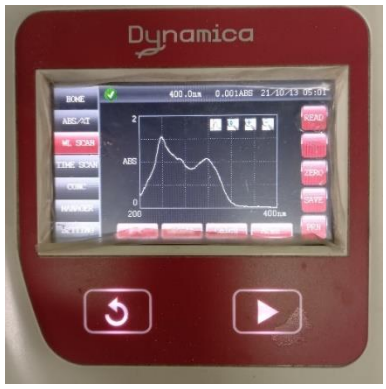
Parameter	No.1	Mean	SD	RSD(%)
T25	10.673	10.673		
T50	24.079	24.079		
T75	43.191	43.191		
T80	48.461	48.461		
T90	62.543	62.543		

Goodness of Fit

Parameter	No.1
N_observed	9
DF	8
R_obs-pre	0.9869
Rsqr	0.9739
Rsqr_adj	0.9739
MSE	1.0971
MSE_root	1.0474

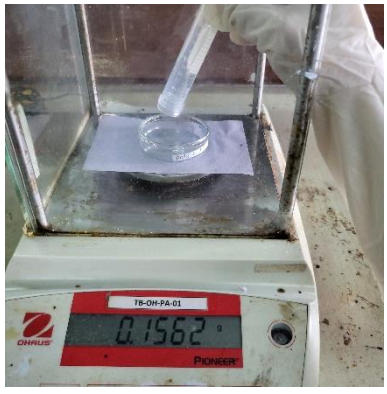
Weighting	1
SS	8.7766
WSS	8.7766
AIC	21.5488
MSC	3.4251

Lampiran 6. Dokumentasi



Gambar 16. Analisis menggunakan spektrofotometer UV-Vis

Gambar 19. *Film* hidrogel setelah *crosslink*



Gambar 17. Pencetakan *film* hidrogel

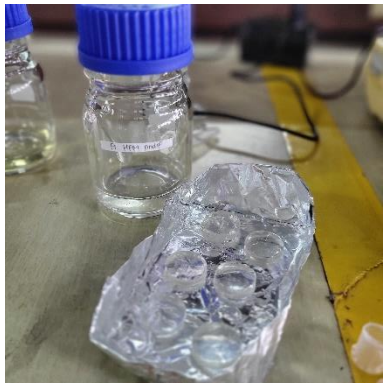
Gambar 20. Uji *swelling film* hidrogel

Gambar 18. *Film* hidrogel

Gambar 21. *Swelling* 24 jam

Gambar 22. Menyiapkan cetakan *microneedle*

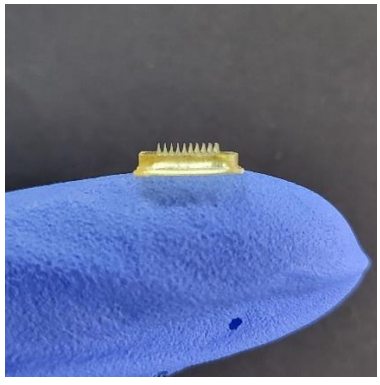
Gambar 23. Cetakan *microneedle*



Gambar 24. *Microneedle* siap dikeringkan

Gambar 25. Pencetakan *microneedles*

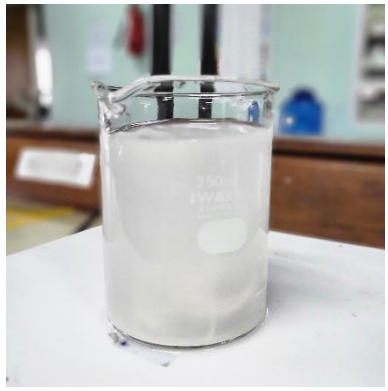
Gambar 26. Pengeringan *microneedles*



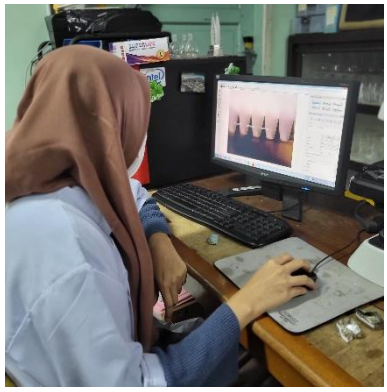
Gambar 27. *Microneedle* setelah *crosslink*

Gambar 28. Uji kemampuan penetrasi

Gambar 29. Pengaturan uji kemampuan penetrasi



Gambar 32. Pencucian kulit



Gambar 30. Uji kekuatan mekanik

Gambar 33. Reservoir tablet kempa langsung

Gambar 31. Preparasi kulit sebelum uji *ex vivo*

Gambar 34. Tampilan kompartemen donor

Gambar 35. Pengujian *ex vivo*

Gambar 36. Pencuplikan dan penggantian media pada uji *ex vivo*