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APPENDIX A

Characterization of Chitin

Table A1 Viscosity-average molecular weight of chitin

Time (sec)	Conc.(g/100 ml)					
	0	0.00625	0.0125	0.025	0.05	0.1
X1	345.50	373.49	412.65	498.16	698.42	1308.79
X2	344.35	375.28	413.24	499.59	698.71	1310.04
X3	343.68	374.77	413.05	498.46	698.94	1309.78
X4	342.29	374.62	412.87	498.79	698.52	1308.80
X5	343.27	375.04	412.93	499.08	698.79	1308.89
Average	343.82	374.64	412.95	498.82	698.68	1309.26
η_{rel}		1.0896	1.2011	1.4508	2.0321	3.8080
η_{sp}		0.0896	0.2011	0.4508	1.0321	2.8080
η_{sp}/c		14.3434	16.0853	18.0326	20.6422	28.0800
$\ln(\eta_{rel})/c$		13.7365	14.6567	14.8850	14.1815	13.3710

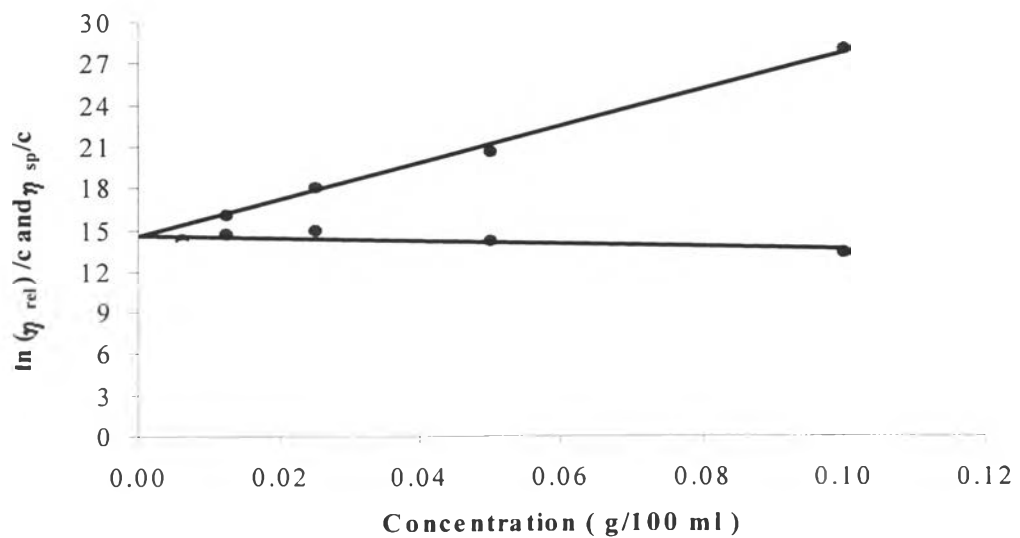


Figure A1 η_{sp}/c and $\ln(\eta_{rel})/C$ against concentration of chitin solution.

The viscosity-average molecular weight of Chitin was determined based on Mark-Houwink equation. The K and a values were according to Lee *et al.*, (1974).

$$[\eta] = 8.93 \times 10^{-4} M^{0.71}$$

Where $[\eta]$ = intrinsic viscosity

M = Viscosity-average molecular weight

Interception: $[\eta] = 14.54$

From calculation; $M = 8.68 \times 10^5$

The viscosity-average molecular weight of chitin obtained from calculation was 8.68×10^5 .

APPENDIX B

Characterization of CM-chitin

Table B1 Viscosity-average molecular weight of CM-chitin

Time (sec)	Conc.(g/100 ml)					
	0	0.00625	0.01250	0.02500	0.05000	0.10000
X1	105.32	109.42	114.37	124.40	146.64	192.17
X2	105.17	109.39	114.05	124.26	146.83	192.06
X3	105.76	109.37	114.27	123.99	146.65	192.58
X4	105.46	109.02	114.05	123.94	146.69	191.87
X5	105.92	109.39	114.29	123.89	146.16	192.78
X6	105.96	109.17	114.01	123.55	146.68	191.28
Average	105.60	109.29	114.17	124.01	146.61	192.12
η_{rel}		1.0350	1.0812	1.1743	1.3884	1.8194
η_{sp}		0.0350	0.0812	0.1743	0.3884	0.8194
η_{sp}/c		5.5986	6.4963	6.9723	7.7671	8.1937
$\ln(\eta_{rel})/c$		5.5029	6.2460	6.4272	6.5625	5.9850

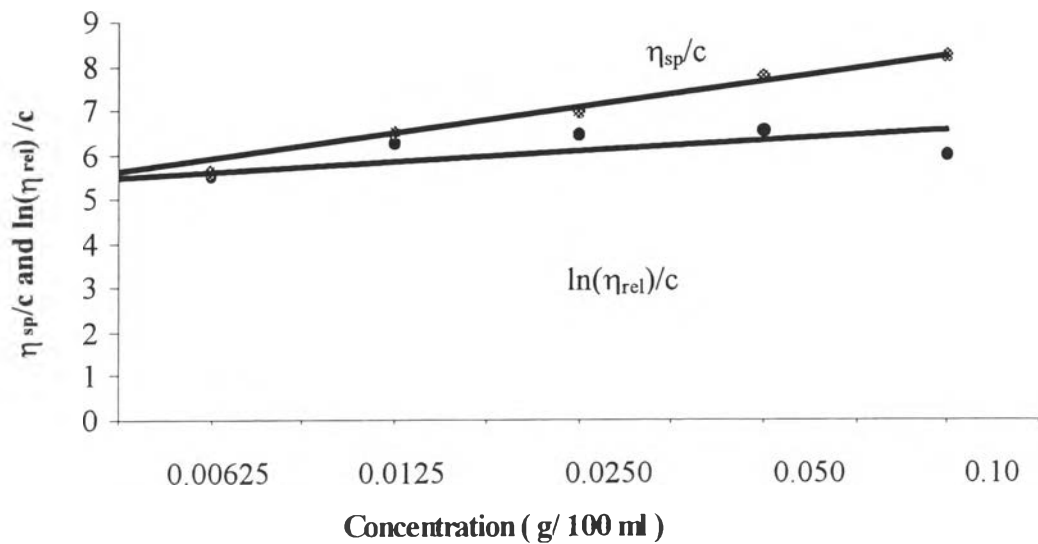


Figure B1 η_{sp}/c and $\ln(\eta_{rel})/C$ against concentration of CM-chitin solution.

The viscosity-average molecular weight of CM-chitin was determined based on Mark-Houwink equation. The K and a values were according to Kaneko *et al.* (1982).

$$[\eta] = 7.92 \times 10^{-5} M^1$$

Where $[\eta]$ = intrinsic viscosity

M = Viscosity-average molecular weight

Interception: $[\eta] = 5.32$

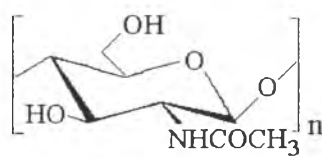
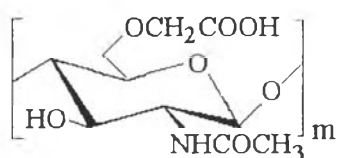
From calculation; $M = 6.7171 \times 10^4$

The viscosity-average molecular weight of CM-chitin obtained from calculation was 6.7171×10^4 .

Table B2 Degree of substitution of CM-chitin from elemental analysis
Experimental values

	%C	%H	%N
1	38.157	6.169	5.161
2	38.044	6.178	5.480
3	38.013	6.771	5.298
4	38.332	6.389	5.366
5	38.353	6.776	5.550
6	38.467	6.766	5.688
Average	38.228	6.508	5.500

Calculation of Degree of Substitution of CM-chitin



$$\text{MW} = \text{C}_{10}\text{H}_{11}\text{O}_3\text{NNa} = 283$$

$$\text{MW} = \text{C}_8\text{H}_{13}\text{O}_5\text{NNa} = 203$$

$$283 m + 203 n = 8.08 \times 10^4 \quad \text{--- (1)}$$

From EA,

$$\%C = 38.228$$

$$\%H = 6.508$$

$$\%N = 5.500$$

We can find that in CM-chitin structure has N.

$$\text{That: } N = \frac{6.7171 \times 10^4 \times 5.50}{100} = 3694.405$$

$$\text{Thus, } 14 m + 14 n = 3694.405 \quad \text{--- (2)}$$

Divide (2) by 14

$$m + n = 263.886$$

$$m = 263.886 - n \quad \text{--- (3)}$$

$$\text{Replace (3) in (1), } 283(263.886) - 283 n + 203 n = 6.7171 \times 10^4$$

$$80 n = 7508.758$$

$$n = 93.86$$

$$m = 170.026$$

$$\text{Therefore, fraction } m = 170.026/263.886 = 0.64$$

$$n = 93.86/263.886 = 0.36$$

The degree of carboxymethylation was estimated to be 0.64.

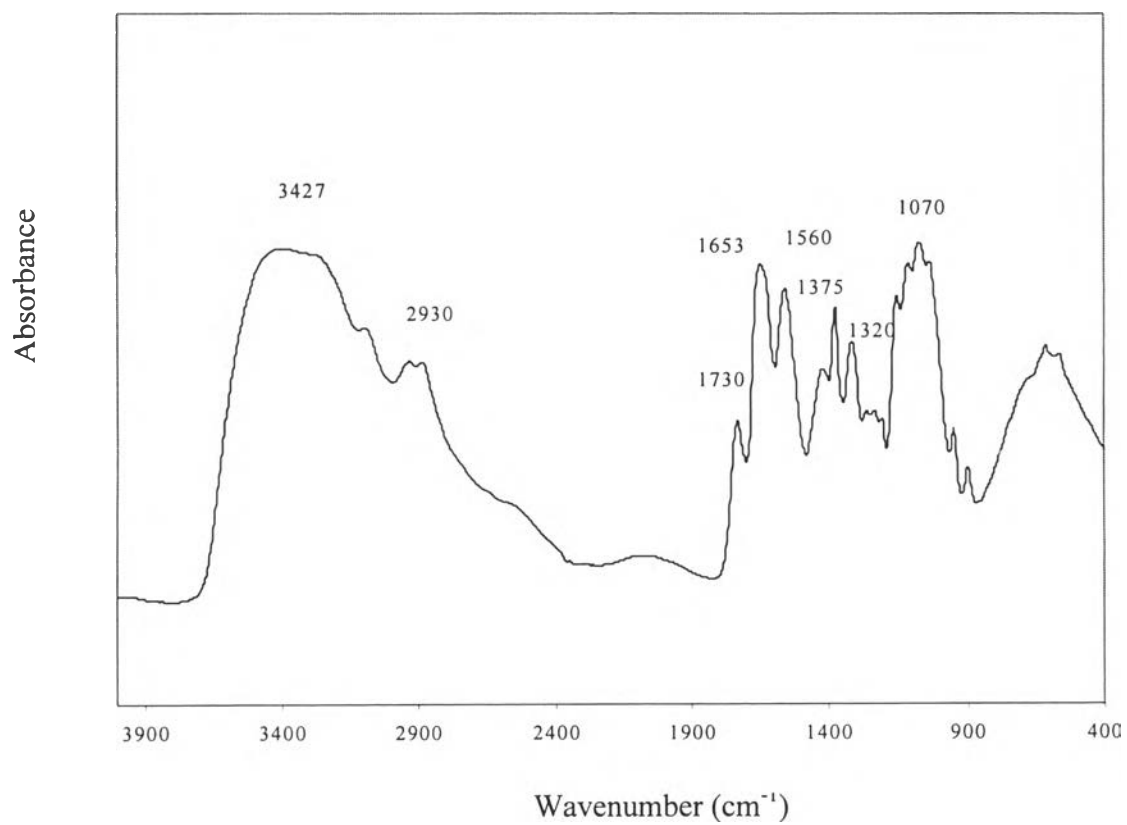


Figure B2 FTIR spectrum of CM-chitin.

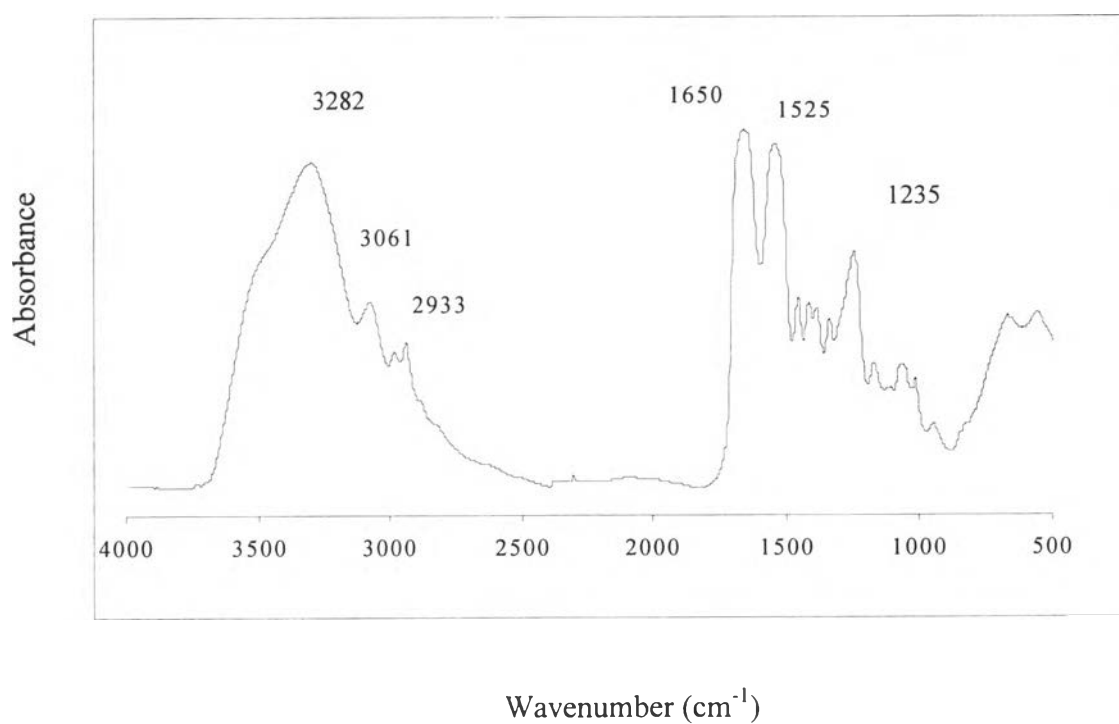


Figure B3 FTIR spectrum of silk foroin.

APPENDIX C

Estimation of Molecular Weight and Molecular Weight Distribution of CM-chitin

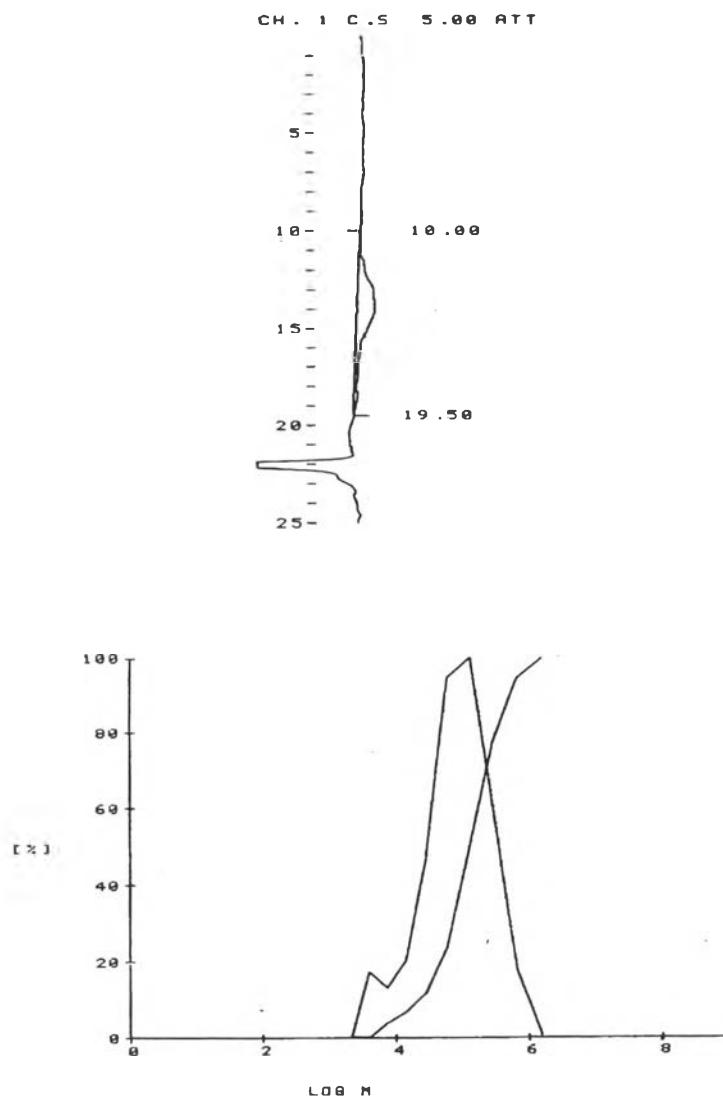


Figure C1 GPC chromatogram of CM-chitin.

Table C1 GPC results of CM-chitin

Sample	RT	Mol- wt/SZ	Height	Accumul	DW/Dlog	Mol-Number
1	10.50	1614083	72	99.969	0.096	0
2	11.50	675086	12514	94.646	17.456	78
3	12.50	292840	41446	77.018	60.370	601
4	13.50	131651	65680	49.083	100.00	2121
5	14.50	61295	59528	23.746	94.837	4130
6	15.50	29534	28055	11.832	46.822	4040
7	16.50	14716	11666	6.870	20.420	3371
8	17.50	7577	7161	3.824	13.163	4019
9	18.50	4029	8993	0.000	17.384	9492
10	19.50	2210	0	0.000	0.000	0
Total				100.00		

Averaged molecular weight and polydispersity

Mn = 35897

Mw = 144983

Mz = 317842

Mv = 144983

Mw/Mn = 4.083

Mz/Mn = 8.854

Mv/Mn = 4.038

APPENDIX D

UV Spectrum of Model Drugs and Glutaraldehyde

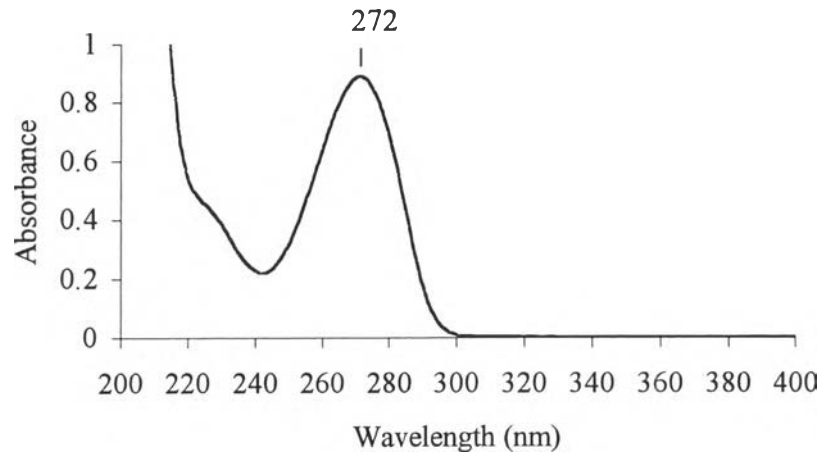


Figure D1 UV spectrum of theophylline.

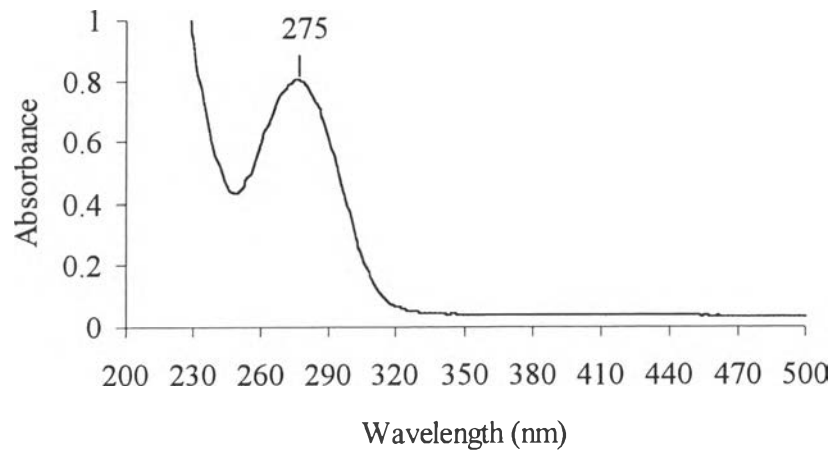


Figure D2 UV spectrum of diclofenac sodium.

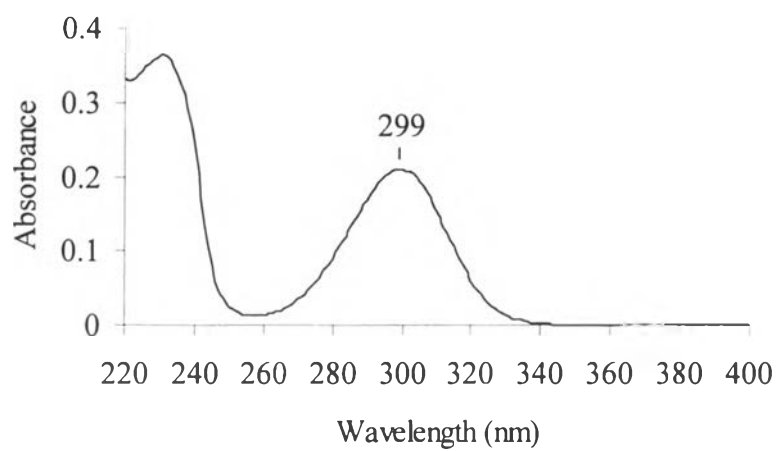


Figure D3 UV spectrum of salicylic acid.

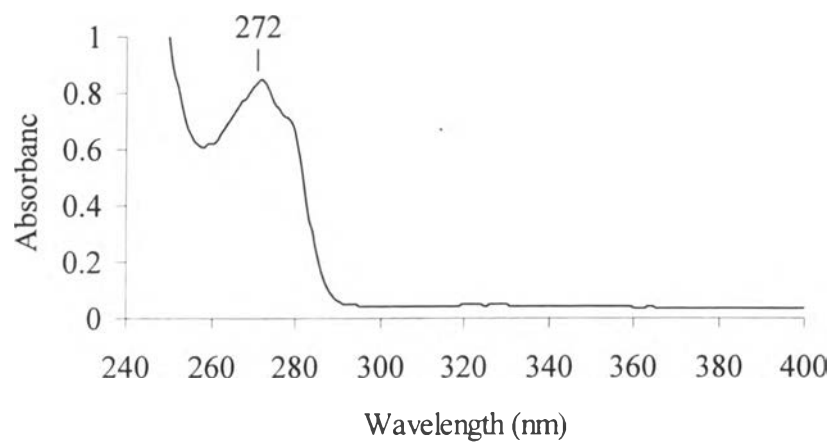


Figure D4 UV spectrum of amoxicillin trihydrate.

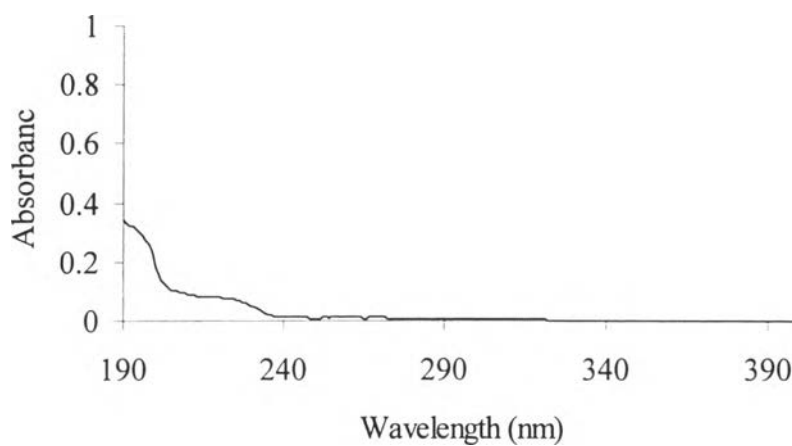


Figure D5 UV spectrum of glutaraldehyde.

Table D1 Summary of maximum wavelength (λ_{\max}) of each type of model drug and glutaraldehyde

Model drug	λ_{\max} (nm)
Theophylline	272
Diclofenac sodium	275
Salicylic acid	299
Amoxicillin trihydrate	272
Glutaraldehyde	No observed

APPENDIX E

Calibration Curve of Model Drugs

Table E1 Calibration curve of salicylic acid solution

Concentration (mg/100mL)	Absorbance at 299nm (A_{299})			Average	Standard deviation
	X1	X2	X3		
0.1	0.0814	0.0817	0.0815	0.0815	0.0002
0.2	0.1131	0.1128	0.1132	0.1130	0.0002
0.3	0.1423	0.1425	0.1426	0.1425	0.0002
0.4	0.1693	0.1697	0.1695	0.1695	0.0002
0.5	0.2126	0.2132	0.2129	0.2129	0.0003
0.6	0.2446	0.2448	0.2454	0.2449	0.0004
0.7	0.2628	0.2624	0.2625	0.2626	0.0002
0.8	0.3104	0.3102	0.3100	0.3102	0.0002
0.9	0.3283	0.3285	0.3287	0.3285	0.0002
1	0.3575	0.3576	0.3573	0.3575	0.0002

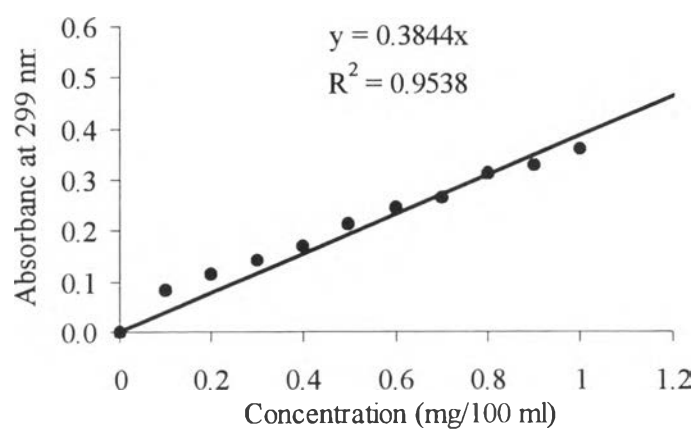


Figure E1 Calibration of salicylic acid solution.

Table E2 The data of calibration curve of theophylline solution

Concentration (mg/100mL)	Absorbance at 272nm (A_{272})			Average	Standard deviation
	X1	X2	X3		
0.1	0.1190	0.1192	0.1189	0.1190	0.0002
0.2	0.2413	0.2418	0.2416	0.2416	0.0003
0.3	0.3597	0.3604	0.3606	0.3602	0.0005
0.4	0.4702	0.4704	0.4707	0.4704	0.0003
0.5	0.5831	0.5827	0.5828	0.5829	0.0002
0.6	0.6938	0.6934	0.6936	0.6936	0.0002
0.7	0.8161	0.8164	0.8160	0.8162	0.0002
0.8	0.9152	0.9154	0.9157	0.9154	0.0003

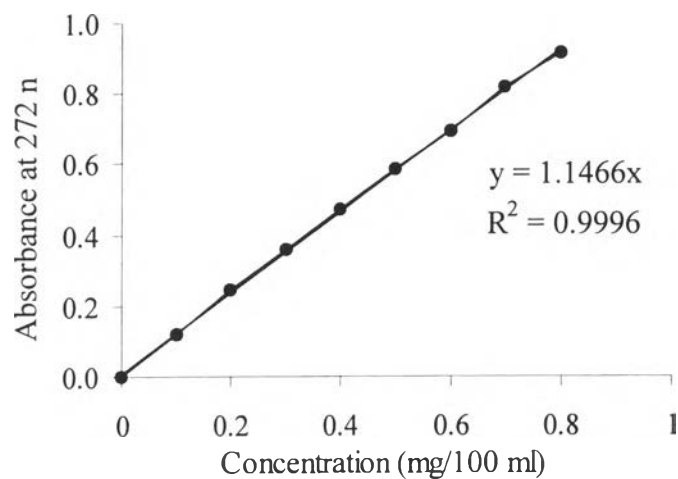
**Figure E2** Calibration of theophylline solution

Table E3 Calibration curve of diclofenac sodium solution

Concentration (mg/100mL)	Absorbance at 275nm (A_{275})			Average	Standard deviation
	X1	X2	X3		
0.1	0.0622	0.0620	0.0621	0.0621	0.0001
0.2	0.1198	0.1196	0.1197	0.1197	0.0001
0.3	0.1712	0.1713	0.1714	0.1713	0.0001
0.4	0.2316	0.2316	0.2315	0.2316	0.0001
0.5	0.2787	0.2786	0.2788	0.2787	0.0001
0.6	0.3373	0.3377	0.3374	0.3375	0.0002
0.7	0.4115	0.4114	0.4116	0.4115	0.0001
0.8	0.4489	0.4490	0.4488	0.4489	0.0001
0.9	0.5082	0.5083	0.5080	0.5082	0.0002
1	0.5293	0.5294	0.5292	0.5293	0.0001

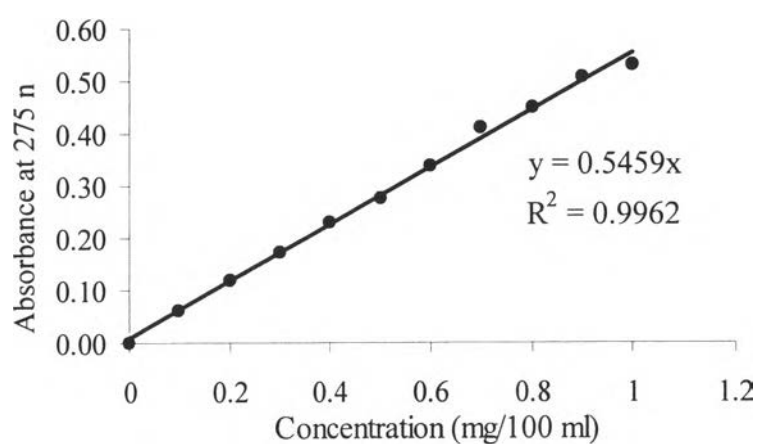
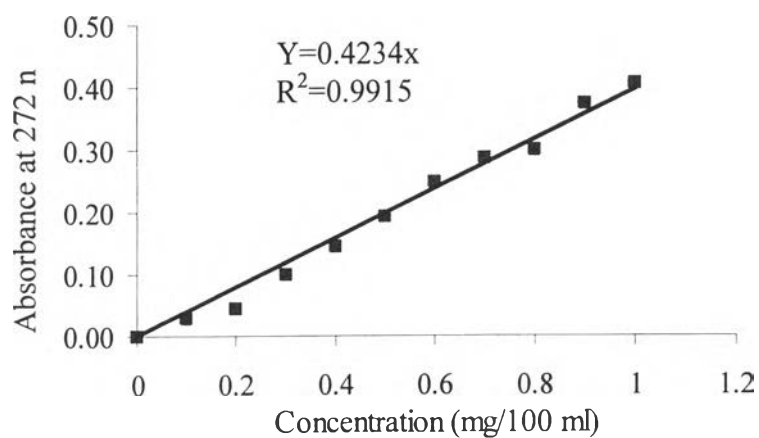
**Figure E3** Calibration of diclofenac sodium solution.

Table E4 Calibration curve of amoxicillin trihydrate solution

Concentration (mg/100mL)	Absorbance at 272nm (A_{272})			Average	Standard deviation
	X1	X2	X3		
0.1	0.0307	0.0306	0.0307	0.0307	0.0001
0.2	0.0453	0.0454	0.0453	0.0453	0.0001
0.3	0.0987	0.0985	0.0984	0.0985	0.0002
0.4	0.1460	0.1458	0.1459	0.1459	0.0001
0.5	0.1922	0.1924	0.1925	0.1924	0.0002
0.6	0.2492	0.2490	0.2493	0.2492	0.0002
0.7	0.2878	0.2880	0.2880	0.2879	0.0001
0.8	0.3013	0.3005	0.3008	0.3009	0.0004
0.9	0.3726	0.3727	0.3725	0.3726	0.0001
1	0.4065	0.4062	0.4063	0.4063	0.0002

**Figure E4** Calibration of amoxicillin trihydrate solution.

APPENDIX F

Data of Drug Release of CM-chitin/Silk Fibroin Blend Films

Table F1 Release of salicylic acid from CM-chitin film at pH 2.0

Time (minutes)	Amount of drug release (%)			Average	Standard deviation
	X1	X2	X3		
0.5	69.55	69.65	70.52	69.91	0.5335
1.0	77.36	77.48	78.01	77.62	0.3459
1.5	79.01	79.14	78.79	78.98	0.1769
2.0	79.32	79.39	78.92	79.21	0.2536
2.5	79.39	79.79	79.64	79.61	0.2021
3.0	79.60	80.14	79.92	79.89	0.2715
3.5	80.01	80.35	80.63	80.33	0.3105
4.0	80.26	80.20	80.48	80.31	0.1474
4.5	80.39	80.42	80.54	80.45	0.0794
5.0	80.57	80.67	80.60	80.61	0.0513
7.5	80.92	80.79	80.98	80.90	0.0971
10	81.42	81.23	81.29	81.31	0.0971
15	81.91	81.88	75.45	79.75	3.7211
20	82.51	82.32	82.26	82.36	0.1305
25	82.60	82.54	82.35	82.50	0.1305
30	82.66	82.57	82.79	82.67	0.1106
40	83.48	83.69	83.73	83.63	0.1343
50	83.94	83.79	84.04	83.92	0.1258
60	84.22	83.88	83.94	84.01	0.1815
120	83.79	83.73	84.01	83.84	0.1474

Table F2 Release of salicylic acid from the blend film with 80% CM-chitin content at pH 2.0

Time (minutes)	Amount of drug release (%)			Average	Standard deviation
	X1	X2	X3		
0.5	59.53	62.00	63.84	61.79	2.1627
1.0	66.93	70.43	65.15	67.50	2.6863
1.5	69.93	71.30	72.24	71.16	1.1617
2.0	70.43	71.77	72.80	71.66	1.1884
2.5	70.65	71.68	73.17	71.83	1.2670
3.0	70.89	71.96	72.86	71.90	0.9862
3.5	70.68	71.43	74.33	72.14	1.9276
4.0	70.80	72.71	74.42	72.64	1.8109
4.5	74.08	74.17	73.89	74.05	0.1429
5.0	73.86	74.45	74.73	74.35	0.4441
7.5	74.52	73.55	75.05	74.37	0.7607
10	74.86	74.11	75.52	74.83	0.7055
15	74.39	74.58	75.14	74.70	0.3899
20	74.45	75.08	75.73	75.09	0.6400
25	75.33	75.73	75.83	75.63	0.2646
30	75.45	75.80	75.89	75.71	0.2325
40	75.58	75.98	76.30	75.95	0.3607
50	76.05	76.23	76.39	76.22	0.1701
60	76.23	76.42	76.45	76.37	0.1193
120	77.04	76.80	76.73	76.86	0.1626

Table F3 Release of salicylic acid from the blend film with 60% CM-chitin content at pH 2.0

Time (minutes)	Amount of drug release (%)			Average	Standard deviation
	X1	X2	X3		
0.5	68.07	68.10	67.66	67.94	0.2458
1.0	69.18	68.68	69.80	69.22	0.5611
1.5	69.43	69.78	69.68	69.63	0.1803
2.0	71.88	71.63	71.20	71.57	0.3439
2.5	72.38	71.99	71.51	71.96	0.4358
3.0	73.05	73.07	73.03	73.05	0.0200
3.5	73.22	73.28	73.17	73.22	0.0551
4.0	73.28	73.51	73.36	73.38	0.1168
4.5	75.65	76.15	75.34	75.71	0.4087
5.0	75.71	75.92	75.17	75.60	0.3869
7.5	75.63	75.98	76.17	75.93	0.2739
10	75.94	76.11	76.23	76.09	0.1457
15	75.78	75.94	76.46	76.06	0.3555
20	75.98	75.92	76.55	76.15	0.3477
25	75.71	76.05	76.40	76.05	0.3450
30	76.15	76.32	76.69	76.39	0.2761
40	76.88	76.80	76.94	76.87	0.0702
50	77.07	77.02	77.44	77.18	0.2294
60	77.71	77.90	77.38	77.66	0.2631
120	78.40	77.94	77.65	78.00	0.3782

Table F4 Release of salicylic acid from the blend film with 50% CM-chitin content at pH 2.0

Time (minutes)	Amount of drug release (%)			Average	Standard deviation
	X1	X2	X3		
0.5	44.99	45.06	45.12	45.06	0.0651
1.0	92.49	51.01	50.59	48.70	24.0706
1.5	52.24	52.28	54.34	52.95	1.2011
2.0	52.88	53.01	54.40	53.43	0.8426
2.5	54.32	54.44	54.30	54.35	0.0757
3.0	57.15	57.27	57.13	57.18	0.0757
3.5	59.27	58.58	58.83	58.89	0.3493
4.0	60.08	60.10	59.23	59.80	0.4966
4.5	60.04	60.08	60.10	60.07	0.0306
5.0	62.31	62.04	62.43	62.26	0.1997
7.5	62.14	62.16	62.52	62.27	0.2139
10	62.39	62.31	62.73	62.48	0.2230
15	62.41	62.83	62.91	62.72	0.2686
20	62.73	63.00	62.87	62.87	0.1350
25	62.96	62.91	63.14	63.00	0.1210
30	63.77	63.66	63.29	63.57	0.2515
40	63.79	63.56	63.70	63.68	0.1159
50	64.10	64.22	64.47	64.26	0.1888
60	65.91	65.85	66.18	65.98	0.1758
120	65.93	66.22	66.06	66.07	0.1453

Table F5 Release of salicylic acid from the blend film with 40% CM-chitin content at pH 2.0

Time (minutes)	Amount of drug release (%)			Average	Standard deviation
	X1	X2	X3		
0.5	55.21	55.38	55.09	55.23	0.1457
1.0	56.00	56.11	55.86	55.99	0.1253
1.5	56.32	56.57	56.63	56.51	0.1644
2.0	56.96	57.15	57.04	57.05	0.0954
2.5	58.92	59.13	58.88	58.98	0.1343
3.0	59.38	59.52	60.00	59.63	0.3252
3.5	59.44	59.69	59.83	59.65	0.1976
4.0	60.50	60.62	60.56	60.56	0.0600
4.5	60.54	60.65	60.77	60.65	0.1150
5.0	61.23	61.46	61.06	61.25	0.2007
7.5	61.21	61.44	61.21	61.29	0.1328
10	61.33	61.60	61.52	61.48	0.1387
15	61.42	61.56	61.89	61.62	0.2413
20	61.35	61.75	61.98	61.69	0.3188
25	61.52	61.81	61.89	61.74	0.1947
30	60.77	61.81	61.98	61.52	0.6551
40	62.52	62.79	62.71	62.67	0.1387
50	62.64	62.91	62.83	62.79	0.1387
60	63.12	63.37	63.08	63.19	0.1572
120	63.23	64.08	63.56	63.62	0.4285

Table F6 Release of salicylic acid from CM-chitin film at pH 5.5

Time (minutes)	Amount of drug release (%)			Average	Standard deviation
	X1	X2	X3		
0.5	55.38	55.50	56.38	55.75	0.5460
1.0	71.61	71.74	71.77	71.71	0.0850
1.5	71.99	72.08	72.67	72.25	0.3694
2.0	72.67	72.86	72.92	72.82	0.1305
2.5	73.17	72.96	70.83	72.32	1.2946
3.0	73.92	73.99	73.49	73.80	0.2707
3.5	74.30	73.49	74.55	74.11	0.5541
4.0	74.42	74.80	74.86	74.69	0.2386
4.5	74.14	73.52	74.80	74.15	0.6401
5.0	74.58	75.11	75.20	74.96	0.3350
7.5	74.61	74.86	74.89	74.79	0.1537
10	75.14	75.36	75.27	75.26	0.1106
15	75.30	75.80	75.45	75.52	0.2566
20	76.05	76.23	76.11	76.13	0.0917
25	76.48	76.42	76.33	76.41	0.0755
30	76.61	76.55	76.42	76.53	0.0971
40	76.73	76.76	76.45	76.65	0.1710
50	76.48	76.45	76.55	76.49	0.0513
60	77.04	76.86	79.85	76.92	0.1069
120	77.20	77.23	76.95	77.13	0.1537

Table F7 Release of salicylic acid from the blend film with 80% CM-chitin content at pH 5.5

Time (minutes)	Amount of drug release (%)			Average	Standard deviation
	X1	X2	X3		
0.5	63.28	63.22	62.87	63.12	0.2214
1.0	67.18	68.18	68.49	67.95	0.6846
1.5	68.96	68.80	68.87	68.88	0.0802
2.0	69.83	69.68	69.74	69.75	0.0755
2.5	70.30	70.55	70.02	70.29	0.2651
3.0	70.40	70.80	70.08	70.43	0.3607
3.5	70.77	71.33	70.83	70.98	0.3075
4.0	71.99	72.08	71.39	71.82	0.3751
4.5	73.11	73.39	73.30	73.27	0.1429
5.0	73.24	73.95	73.11	73.43	0.4521
7.5	73.49	73.92	73.33	73.58	0.3051
10	73.70	73.49	73.42	73.54	0.1457
15	73.80	73.61	73.92	73.78	0.1563
20	73.92	73.67	73.33	73.64	0.2961
25	73.83	73.80	73.49	73.71	0.1882
30	74.02	73.92	73.77	73.90	0.1258
40	74.42	74.11	74.02	74.18	0.2098
50	74.52	74.36	74.14	74.34	0.1908
60	74.58	74.80	74.45	74.61	0.1769
120	74.95	74.86	74.52	74.78	0.2268

Table F8 Release of salicylic acid from the blend film with 60% CM-chitin content at pH 5.5

Time (minutes)	Amount of drug release (%)			Average	Standard deviation
	X1	X2	X3		
0.5	46.20	46.24	46.33	46.26	0.0666
1.0	53.34	53.28	52.51	53.04	0.4629
1.5	53.22	53.09	53.51	53.27	0.2150
2.0	55.50	55.57	55.09	55.39	0.2593
2.5	56.94	58.92	58.36	58.07	1.0207
3.0	58.79	57.02	56.77	57.53	1.1012
3.5	56.17	55.92	55.80	55.96	0.1888
4.0	56.92	57.21	57.52	57.22	0.3001
4.5	57.21	58.29	59.38	58.29	1.0850
5.0	57.40	58.56	59.85	58.60	1.2256
7.5	59.77	59.81	59.96	59.85	0.1002
10	59.96	59.83	60.23	60.01	0.2040
15	60.17	60.04	60.29	60.17	0.1250
20	61.48	61.87	61.75	61.70	0.1997
25	62.00	62.04	62.14	62.06	0.0721
30	61.98	62.08	61.69	61.92	0.2026
40	62.68	62.81	62.08	62.52	0.3894
50	62.96	63.00	62.60	62.85	0.2203
60	63.41	63.39	62.73	63.18	0.3870
120	63.83	63.79	63.50	63.71	0.1801

Table F9 Release of salicylic acid from the blend film with 50% CM-chitin content at pH 5.5

Time (minutes)	Amount of drug release (%)			Average	Standard deviation
	X1	X2	X3		
0.5	51.53	51.93	51.01	51.49	0.4613
1.0	54.65	55.01	54.42	54.69	0.2974
1.5	55.59	55.88	55.96	55.81	0.1947
2.0	55.63	56.15	56.27	56.02	0.3402
2.5	56.05	56.02	56.02	56.03	0.0173
3.0	56.48	56.25	56.52	56.42	0.1457
3.5	56.07	56.36	56.63	56.35	0.2801
4.0	56.69	56.57	56.67	56.64	0.0643
4.5	56.92	57.07	56.82	56.94	0.1258
5.0	56.98	57.34	57.38	57.23	0.2203
7.5	57.04	57.88	57.63	57.52	0.4313
10	57.36	57.94	58.09	57.80	0.3855
15	56.98	58.04	58.13	57.72	0.6396
20	57.07	58.23	58.15	57.82	0.6479
25	57.88	58.04	58.42	58.11	0.2774
30	58.77	58.56	58.77	58.70	0.1212
40	59.31	59.60	59.33	59.41	0.1620
50	61.91	60.83	61.27	61.34	0.5431
60	62.37	61.50	61.77	61.88	0.4453
120	64.52	65.14	62.16	63.94	1.5724

Table F10 Release of salicylic acid from the blend film with 40% CM-chitin content at pH 5.5

Time (minutes)	Amount of drug release (%)			Average	Standard deviation
	X1	X2	X3		
0.5	42.41	42.46	42.81	42.56	0.2179
1.0	52.03	52.17	51.65	51.95	0.2691
1.5	50.18	50.39	50.72	50.43	0.2722
2.0	54.17	54.48	54.55	54.40	0.2022
2.5	54.53	54.76	54.90	54.73	0.1868
3.0	54.36	54.86	55.09	54.77	0.3732
3.5	55.11	55.21	55.36	55.23	0.1258
4.0	55.71	55.59	55.53	55.61	0.0917
4.5	55.67	55.69	55.94	55.77	0.1504
5.0	55.92	56.00	56.07	56.00	0.0751
7.5	56.21	56.27	56.48	56.32	0.1418
10	56.42	56.57	56.27	56.42	0.1500
15	56.34	56.67	56.90	56.64	0.2815
20	57.15	56.90	57.21	57.09	0.1644
25	57.61	57.38	57.50	57.50	0.1150
30	57.98	57.84	58.00	57.94	0.0872
40	58.13	57.96	58.23	58.11	0.1365
50	58.42	58.19	58.50	58.37	0.1609
60	58.50	58.56	58.79	58.62	0.1531
120	61.52	61.33	61.42	61.42	0.0950

Table F11 Release of salicylic acid from CM-chitin film at pH 7.2

Time (minutes)	Amount of drug release (%)			Average	Standard deviation
	X1	X2	X3		
0.5	50.35	48.92	52.57	50.61	1.8392
1.0	56.04	49.26	54.85	53.38	3.6201
1.5	58.22	58.31	60.24	58.92	1.1412
2.0	66.40	63.84	70.21	66.82	3.2054
2.5	68.46	65.43	71.02	68.30	2.7983
3.0	69.74	65.81	72.27	69.27	3.2552
3.5	69.74	68.43	73.49	70.55	2.6262
4.0	74.86	71.86	76.67	74.46	2.4294
4.5	76.67	74.24	81.54	77.48	3.7173
5.0	81.76	81.48	85.10	82.78	2.0141
7.5	82.04	81.76	84.97	82.92	1.7780
10	85.75	83.19	82.41	83.78	1.7473
15	86.25	79.48	85.47	83.73	3.7041
20	85.91	81.42	88.72	85.35	3.6821
25	86.19	81.95	88.47	85.54	3.3087
30	86.60	82.45	88.94	86.00	3.2868
40	86.47	82.57	89.16	86.07	3.3135
50	86.97	82.48	89.84	86.43	3.7096
60	87.10	84.26	90.25	87.20	2.9963
120	91.65	88.63	94.59	91.62	2.9801

Table F12 Release of salicylic acid from the blend film with 80% CM-chitin content at pH 7.2

Time (minutes)	Amount of drug release (%)			Average	Standard deviation
	X1	X2	X3		
0.5	52.92	53.15	53.19	53.09	0.1457
1.0	68.37	68.6	68.03	68.33	0.2868
1.5	75.78	74.98	75.94	75.57	0.5143
2.0	80.83	81.12	80.42	80.79	0.3517
2.5	81.06	81.25	80.65	80.99	0.3066
3.0	81.23	81.46	80.83	81.17	0.3188
3.5	82.04	81.75	81.33	81.71	0.3570
4.0	82.37	81.60	81.44	81.80	0.4972
4.5	82.23	81.75	81.64	81.87	0.3137
5.0	82.27	81.73	81.71	81.90	0.3177
7.5	82.29	81.83	81.87	82.00	0.2548
10	82.37	81.81	81.75	81.98	0.3420
15	82.85	81.96	81.83	82.21	0.5552
20	82.73	82.50	82.23	82.49	0.2503
25	83.00	82.66	82.52	82.73	0.2468
30	82.79	82.71	82.25	82.58	0.2914
40	83.02	82.91	82.64	82.86	0.1955
50	84.00	84.31	84.12	84.14	0.1563
60	84.89	83.6	84.64	84.38	0.6841
120	86.49	86.51	86.99	86.66	0.2831

Table F13 Release of salicylic acid from the blend film with 60% CM-chitin content at pH 7.2

Time (minutes)	Amount of drug release (%)			Average	Standard deviation
	X1	X2	X3		
0.5	64.75	65.03	68.46	66.08	2.0659
1.0	69.74	70.08	70.61	70.14	0.4384
1.5	70.43	71.21	71.43	71.02	0.5255
2.0	69.61	71.14	71.61	70.79	1.0458
2.5	70.18	71.36	72.05	71.20	0.9456
3.0	70.24	71.96	72.64	71.61	1.2370
3.5	69.27	72.61	73.42	71.77	2.1998
4.0	69.80	73.08	73.27	72.05	1.9509
4.5	73.52	73.83	73.92	73.76	0.2098
5.0	73.74	74.11	74.36	74.07	0.3119
7.5	74.05	74.33	74.42	74.27	0.1930
10	74.42	74.67	74.86	74.65	0.2207
15	74.20	75.05	75.30	74.85	0.5766
20	74.36	75.20	75.58	75.05	0.6243
25	74.52	75.36	75.67	75.18	0.5950
30	75.08	75.30	76.05	75.48	0.5086
40	75.48	75.80	76.01	75.76	0.2669
50	76.01	76.14	76.20	76.12	0.0971
60	76.11	76.61	76.89	76.54	0.3951
120	76.76	77.29	77.14	77.06	0.2732

Table F14 Release of salicylic acid from the blend film with 50% CM-chitin content at pH 7.2

Time (minutes)	Amount of drug release (%)			Average	Standard deviation
	X1	X2	X3		
0.5	57.65	57.77	58.56	57.99	0.4944
1.0	66.64	66.60	66.95	66.73	0.1916
1.5	67.53	67.70	67.80	67.68	0.1365
2.0	68.57	68.66	68.35	68.53	0.1595
2.5	68.93	69.28	69.26	69.16	0.1966
3.0	69.01	68.89	69.45	69.12	0.2948
3.5	70.57	70.57	70.41	70.52	0.0924
4.0	70.39	70.70	70.91	70.67	0.2616
4.5	70.47	70.93	71.07	70.82	0.3139
5.0	70.93	71.30	72.61	71.61	0.8827
7.5	71.20	71.24	71.53	71.32	0.1801
10	72.01	72.05	71.82	71.96	0.1229
15	72.17	71.97	72.05	72.06	0.1007
20	72.32	72.11	72.30	72.24	0.1159
25	72.47	72.38	72.24	72.36	0.1159
30	72.86	72.80	72.45	72.70	0.2214
40	73.22	72.92	73.07	73.07	0.1500
50	73.94	73.36	73.94	73.75	0.3349
60	74.34	74.46	74.11	74.30	0.1779
120	83.68	83.68	82.79	83.38	0.5138

Table F15 Release of salicylic acid from the blend film with 40% CM-chitin content at pH 7.2

Time (minutes)	Amount of drug release (%)			Average	Standard deviation
	X1	X2	X3		
0.5	47.81	47.95	48.12	47.96	0.1552
1.0	50.57	50.70	50.49	50.59	0.1060
1.5	52.22	52.43	52.28	52.31	0.1082
2.0	53.63	53.86	53.11	53.53	0.3842
2.5	53.86	54.01	58.95	55.61	2.8964
3.0	54.11	54.30	54.42	54.28	0.1563
3.5	54.92	54.78	54.63	54.78	0.1450
4.0	55.69	55.27	55.07	55.34	0.3164
4.5	56.27	56.40	56.52	56.40	0.1250
5.0	57.10	57.15	56.85	57.03	0.1607
7.5	58.25	59.08	58.87	58.73	0.4315
10	59.14	59.33	59.50	59.32	0.1801
15	60.18	59.56	59.81	59.85	0.3119
20	60.93	61.10	61.16	61.06	0.1193
25	61.18	61.24	61.12	61.18	0.0600
30	61.78	62.05	62.26	62.03	0.2406
40	63.32	63.26	62.95	63.18	0.1986
50	63.63	63.70	63.88	63.74	0.1290
60	64.22	64.42	63.78	64.14	0.3274
120	65.86	65.30	66.38	65.85	0.5401

Table F16 Release of theophylline from CM-chitin film at pH 2.0

Time (minutes)	Amount of drug release (%)			Average	Standard deviation
	X1	X2	X3		
0.5	27.32	27.02	26.60	26.98	0.3573
1.0	31.04	31.38	30.11	30.85	0.6570
1.5	40.96	40.77	40.82	40.85	0.0968
2.0	44.44	44.74	44.85	44.68	0.2090
2.5	44.91	45.22	45.07	45.07	0.1535
3.0	45.65	45.61	45.22	45.49	0.2386
3.5	46.14	46.89	46.62	46.55	0.3816
4.0	47.11	47.06	46.80	46.99	0.1690
4.5	48.08	47.43	46.96	47.49	0.5606
5.0	48.17	47.95	47.68	47.93	0.2445
7.5	48.75	48.52	48.72	48.66	0.1256
10	49.36	49.30	49.39	49.35	0.0458
15	50.18	50.13	49.66	49.99	0.2850
20	51.00	51.00	51.05	51.02	0.0304
25	52.78	52.77	53.01	52.85	0.1350
30	53.31	54.31	55.20	54.27	0.9494
40	56.24	56.19	56.07	56.16	0.0861
50	56.37	56.35	56.31	56.34	0.0330
60	56.44	56.45	56.35	56.41	0.0529
120	57.16	56.74	56.53	56.81	0.3197

Table F17 Release of theophylline from the blend film with 80% CM-chitin content at pH 2.0

Time (minutes)	Amount of drug release (%)			Average	Standard deviation
	X1	X2	X3		
0.5	40.97	41.23	39.95	40.72	0.6751
1.0	45.60	44.00	46.52	45.38	1.2744
1.5	46.40	46.54	43.47	45.47	1.7336
2.0	48.07	46.81	48.09	47.66	0.7332
2.5	49.02	47.61	49.06	48.56	0.8301
3.0	51.04	50.71	50.31	50.69	0.3667
3.5	51.25	50.92	50.84	51.00	0.2215
4.0	51.53	51.00	51.10	51.21	0.2848
4.5	51.69	51.30	51.51	51.50	0.1954
5.0	52.23	51.34	51.45	51.68	0.4842
7.5	52.52	51.41	51.53	51.82	0.6051
10	52.77	52.66	51.85	52.43	0.5002
15	52.93	52.89	52.50	52.78	0.2363
20	53.16	53.23	52.88	53.09	0.1846
25	54.18	53.67	53.05	53.64	0.5659
30	54.51	54.02	53.05	53.86	0.7422
40	54.74	53.98	53.33	54.02	0.7088
50	55.38	54.48	54.17	54.68	0.6262
60	55.95	55.76	56.70	56.14	0.4944
120	58.50	56.03	57.79	57.44	1.2714

Table F18 Release of theophylline from the blend film with 60% CM-chitin content at pH 2.0

Time (minutes)	Amount of drug release (%)			Average	Standard deviation
	X1	X2	X3		
0.5	44.33	41.67	42.59	42.86	1.3499
1.0	45.64	42.03	43.60	43.76	1.8122
1.5	47.41	44.05	44.85	45.44	1.7537
2.0	47.59	45.64	46.24	46.49	0.9977
2.5	48.29	45.68	46.71	46.89	1.3147
3.0	49.28	47.28	47.80	48.12	1.0385
3.5	50.12	47.54	48.31	48.66	1.3256
4.0	51.74	49.04	49.62	50.13	1.4242
4.5	52.43	51.07	51.72	51.74	0.6839
5.0	53.29	52.52	51.64	52.49	0.8239
7.5	53.37	52.66	52.68	52.90	0.4029
10	54.32	52.74	53.12	53.39	0.8223
15	55.07	53.32	54.31	54.23	0.8781
20	55.26	53.85	54.21	54.44	0.7329
25	55.51	54.62	54.28	54.80	0.6367
30	55.45	54.74	54.80	55.00	0.3958
40	55.71	55.08	55.24	55.34	0.3263
50	56.05	54.95	55.51	55.51	0.5512
60	56.30	55.21	55.45	55.65	0.5711
120	56.34	56.68	55.76	56.26	0.4624

Table F19 Release of theophylline from the blend film with 50% CM-chitin content at pH 2.0

Time (minutes)	Amount of drug release (%)			Average	Standard deviation
	X1	X2	X3		
0.5	23.94	23.98	24.08	24.00	0.0758
0.5	23.83	23.88	23.98	23.90	0.0755
1.0	28.71	28.70	29.86	29.09	0.6667
1.5	38.18	38.14	38.35	38.23	0.1121
2.0	38.40	38.28	38.45	38.38	0.0900
2.5	44.43	44.48	44.70	44.54	0.1451
3.0	47.11	47.16	47.21	47.16	0.0524
3.5	48.06	48.11	47.52	47.90	0.3252
4.0	49.09	49.15	48.94	49.06	0.1084
4.5	49.57	49.64	49.59	49.60	0.0388
5.0	49.64	49.64	49.70	49.66	0.0344
7.5	50.52	50.83	50.73	50.69	0.1569
10	50.80	50.89	51.10	50.93	0.1539
15	51.21	51.30	51.16	51.22	0.0746
20	52.22	52.22	52.29	52.24	0.0363
25	52.35	52.40	52.84	52.53	0.2690
30	53.72	53.33	53.06	53.37	0.3299
40	53.88	53.95	53.31	53.71	0.3482
50	54.22	54.21	54.43	54.28	0.1250
60	54.60	54.62	54.58	54.60	0.0176
120	55.66	56.51	56.58	56.25	0.5168

Table F20 Release of theophylline from the blend film with 40% CM-chitin content at pH 2.0

Time (minutes)	Amount of drug release (%)			Average	Standard deviation
	X1	X2	X3		
0.5	40.10	41.50	40.50	40.70	0.7199
1.0	45.15	44.99	44.14	44.76	0.5398
1.5	46.01	45.87	47.31	46.40	0.7903
2.0	47.11	47.03	46.75	46.96	0.1912
2.5	47.49	47.54	47.46	47.50	0.0426
3.0	48.04	48.06	47.95	48.01	0.0593
3.5	48.37	48.29	48.24	48.30	0.0671
4.0	48.45	48.55	48.33	48.44	0.1083
4.5	48.46	48.52	48.48	48.49	0.0290
5.0	48.58	48.55	48.58	48.57	0.0201
7.5	48.72	48.58	48.67	48.66	0.0702
10	48.80	48.64	48.73	48.72	0.0769
15	48.87	48.75	48.81	48.81	0.0594
20	48.92	48.89	48.99	48.93	0.0495
25	49.08	48.96	49.15	49.06	0.0952
30	49.18	49.02	49.11	49.10	0.0802
40	49.15	49.44	49.50	49.36	0.1874
50	49.22	49.48	49.71	49.47	0.2442
60	49.78	49.71	49.85	49.78	0.0699
120	52.18	50.22	50.12	50.84	1.1621

Table F21 Release of theophylline from the CM-chitin film at pH 5.5

Time (minutes)	Amount of drug release (%)			Average	Standard deviation
	X1	X2	X3		
0.5	36.63	37.96	37.52	37.37	0.6791
1.0	44.05	41.00	40.59	41.88	1.8920
1.5	46.06	46.16	44.92	45.71	0.6905
2.0	48.51	48.51	48.18	48.40	0.1934
2.5	48.73	48.64	48.53	48.64	0.0980
3.0	49.18	49.20	48.97	49.12	0.1314
3.5	49.36	49.81	49.84	49.67	0.2663
4.0	49.83	49.72	49.80	49.78	0.0581
4.5	50.10	49.81	49.88	49.93	0.1531
5.0	50.22	49.87	50.60	50.23	0.3629
7.5	50.52	50.58	50.43	50.51	0.0740
10	50.63	50.81	50.65	50.70	0.0992
15	51.06	51.19	50.94	51.06	0.1256
20	51.50	51.25	51.22	51.32	0.1537
25	51.69	51.71	51.50	51.64	0.1193
30	51.92	51.97	51.57	51.82	0.2185
40	52.76	52.74	53.36	52.95	0.3526
50	53.52	53.47	53.25	53.41	0.1437
60	54.58	54.42	54.11	54.37	0.2406
120	55.69	54.51	54.51	54.90	0.6828

Table F22 Release of theophylline from the blend film with 80% CM-chitin content at pH 5.5

Time (minutes)	Amount of drug release (%)			Average	Standard deviation
	X1	X2	X3		
0.5	45.58	45.37	45.40	45.45	0.1136
1.0	46.63	46.38	46.01	46.34	0.3087
1.5	47.95	47.78	48.08	47.94	0.1507
2.0	48.41	48.34	48.74	48.50	0.2110
2.5	49.22	49.29	49.66	49.39	0.2378
3.0	49.27	50.89	50.07	50.08	0.8094
3.5	50.25	51.47	49.27	50.33	1.1012
4.0	51.14	52.08	51.05	51.42	0.5695
4.5	52.54	52.91	51.23	52.23	0.8797
5.0	52.86	53.00	52.81	52.89	0.0978
7.5	53.37	53.09	53.03	53.16	0.1794
10	53.25	53.16	53.22	53.21	0.0465
15	53.30	53.32	53.46	53.36	0.0872
20	53.32	53.29	53.47	53.36	0.0937
25	53.35	53.45	53.61	53.47	0.1266
30	53.37	53.39	53.69	53.48	0.1796
40	53.40	53.47	53.73	53.53	0.1740
50	53.67	53.53	54.02	53.74	0.2555
60	54.00	54.30	54.43	54.24	0.2178
120	55.69	54.72	56.28	55.57	0.7890

Table F23 Release of theophylline from the blend film with 60% CM-chitin content at pH 5.5

Time (minutes)	Amount of drug release (%)			Average	Standard deviation
	X1	X2	X3		
0.5	44.97	45.27	45.40	45.21	0.2225
1.0	45.82	45.89	47.23	46.31	0.7943
1.5	47.77	47.65	47.61	47.67	0.0871
2.0	48.67	48.44	48.14	48.41	0.2623
2.5	49.03	49.99	49.39	49.47	0.4863
3.0	49.89	50.19	49.24	49.77	0.4812
3.5	50.72	50.29	50.12	50.38	0.3097
4.0	51.25	50.32	50.06	50.54	0.6277
4.5	51.33	50.31	49.99	50.54	0.7006
5.0	51.38	50.98	50.36	50.91	0.5134
7.5	51.34	51.16	50.68	51.06	0.3426
10	51.37	51.20	50.65	51.07	0.3760
15	51.47	51.28	50.51	51.09	0.5050
20	52.08	51.38	50.84	51.44	0.6228
25	53.01	52.58	51.06	52.21	1.0234
30	53.17	53.31	53.26	53.25	0.0702
40	53.17	53.24	53.40	53.27	0.1219
50	53.29	53.32	54.14	53.58	0.4795
60	53.31	53.25	54.16	53.58	0.5103
120	54.14	53.36	54.57	54.02	0.6116

Table F24 Release of theophylline from the blend film with 50% CM-chitin content at pH 5.5

Time (minutes)	Amount of drug release (%)			Average	Standard deviation
	X1	X2	X3		
0.5	23.72	23.63	23.76	23.70	0.0671
1.0	23.75	23.90	24.12	23.92	0.1858
1.5	24.36	24.43	24.32	24.37	0.0527
2.0	36.88	36.90	36.66	36.81	0.1354
2.5	41.07	41.15	41.40	41.21	0.1715
3.0	45.79	45.66	46.14	45.86	0.2487
3.5	46.55	46.61	46.60	46.59	0.0330
4.0	47.79	47.83	48.25	47.95	0.2546
4.5	49.66	49.73	49.76	49.72	0.0495
5.0	49.65	50.05	50.10	49.93	0.2466
7.5	51.02	51.54	50.88	51.15	0.3468
10	52.13	52.18	51.74	52.02	0.2386
15	52.35	52.21	51.78	52.11	0.2983
20	52.45	52.31	52.23	52.33	0.1097
25	52.49	52.35	52.44	52.43	0.0708
30	52.58	52.42	52.51	52.50	0.0805
40	52.66	52.61	52.70	52.66	0.0420
50	52.93	52.55	52.67	52.72	0.1927
60	53.03	52.89	52.78	52.90	0.1292
120	53.08	52.98	52.89	52.98	0.0944

Table F25 Release of theophylline from the blend film with 40% CM-chitin content at pH 5.5

Time (minutes)	Amount of drug release (%)			Average	Standard deviation
	X1	X2	X3		
0.5	40.30	40.33	39.23	39.96	0.6266
1.0	43.59	43.64	43.35	43.53	0.1545
1.5	43.73	43.59	43.58	43.63	0.0809
2.0	43.80	43.74	43.77	43.77	0.0314
2.5	43.87	43.79	43.78	43.81	0.0505
3.0	44.50	44.61	44.25	44.45	0.1858
3.5	45.18	44.99	45.32	45.16	0.1646
4.0	45.70	45.75	45.68	45.71	0.0358
4.5	46.22	46.31	46.11	46.21	0.1047
5.0	46.53	46.37	46.57	46.49	0.1042
7.5	46.62	46.45	46.64	46.57	0.1072
10	46.71	46.55	46.69	46.65	0.0873
15	46.78	46.66	46.82	46.75	0.0872
20	46.87	46.80	47.04	46.91	0.1219
25	47.07	46.99	47.12	47.06	0.0671
30	47.74	47.84	47.35	47.64	0.2545
40	47.86	47.95	47.47	47.76	0.2519
50	47.96	48.01	47.74	47.90	0.1451
60	48.51	48.50	48.30	48.43	0.1189
120	49.58	49.83	49.73	49.71	0.1266

Table F26 Release of theophylline from the CM-chitin film at pH 7.2

Time (minutes)	Amount of drug release (%)			Average	Standard deviation
	X1	X2	X3		
0.5	31.26	31.24	30.88	31.13	0.2117
1.0	33.04	32.93	33.47	33.14	0.2874
1.5	33.60	34.35	33.78	33.91	0.3905
2.0	33.99	34.70	34.27	34.32	0.3585
2.5	34.62	34.98	35.11	34.90	0.2536
3.0	35.03	35.08	35.12	35.08	0.0454
3.5	35.23	35.15	35.09	35.16	0.0699
4.0	35.49	35.23	35.40	35.37	0.1348
4.5	35.64	35.42	35.43	35.50	0.1251
5.0	36.09	36.03	35.53	35.89	0.3058
7.5	39.32	38.25	40.41	39.33	1.0815
10	48.27	47.95	47.54	47.92	0.3636
15	48.73	48.27	47.70	48.23	0.5137
20	48.92	48.64	48.71	48.76	0.1413
25	50.14	48.24	48.83	49.07	0.9747
30	50.80	51.01	51.13	50.98	0.1661
40	53.32	51.73	52.41	52.48	0.7983
50	58.00	53.39	53.65	55.01	2.5913
60	65.85	65.03	64.90	65.26	0.5139
120	66.80	66.87	66.72	66.80	0.0733

Table F27 Release of theophylline from the blend film with 80% CM-chitin content at pH 7.2

Time (minutes)	Amount of drug release (%)			Average	Standard deviation
	X1	X2	X3		
0.5	46.82	47.42	46.38	46.87	0.5182
1.0	47.95	47.97	47.14	47.68	0.4732
1.5	48.31	47.97	47.45	47.91	0.4325
2.0	49.13	48.86	48.66	48.88	0.2344
2.5	50.19	49.44	48.94	49.52	0.6321
3.0	50.35	49.85	49.50	49.90	0.4312
3.5	50.84	50.18	49.41	50.14	0.7194
4.0	51.05	50.34	49.42	50.27	0.8185
4.5	51.25	50.51	49.59	50.45	0.8353
5.0	51.59	50.81	50.03	50.81	0.7780
7.5	51.69	50.89	50.80	51.13	0.4915
10	52.13	51.00	51.22	51.45	0.6026
15	52.43	51.44	51.40	51.75	0.5823
20	53.19	51.85	51.74	52.26	0.8098
25	53.73	52.29	52.86	52.96	0.7273
30	54.38	52.45	52.34	53.05	1.1494
40	54.71	53.10	52.39	53.40	1.1904
50	55.16	54.30	53.36	54.28	0.9004
60	56.61	58.29	56.31	57.07	1.0680
120	66.28	62.01	60.69	62.99	2.9213

Table F28 Release of theophylline from the blend film with 60% CM-chitin content at pH 7.2

Time (minutes)	Amount of drug release (%)			Average	Standard deviation
	X1	X2	X3		
0.5	48.22	47.95	47.00	47.72	0.6410
1.0	49.18	48.34	48.24	48.58	0.5139
1.5	49.94	50.61	49.38	49.98	0.6184
2.0	50.65	51.32	50.43	50.80	0.4659
2.5	51.26	52.10	52.13	51.83	0.4917
3.0	52.11	52.18	52.26	52.18	0.0736
3.5	52.48	52.30	52.18	52.32	0.1543
4.0	52.34	52.41	52.35	52.36	0.0369
4.5	52.55	52.52	52.43	52.50	0.0660
5.0	52.65	52.41	52.66	52.58	0.1412
7.5	53.13	52.50	52.75	52.79	0.3193
10	54.16	53.15	53.01	53.44	0.6242
15	54.55	53.33	53.17	53.68	0.7571
20	54.72	53.85	54.01	54.19	0.4642
25	54.81	53.93	54.20	54.31	0.4539
30	54.76	54.11	54.99	54.62	0.4548
40	54.95	54.35	54.73	54.68	0.3070
50	55.13	54.51	55.15	54.93	0.3647
60	55.29	54.74	55.78	55.27	0.5166
120	56.30	55.62	56.50	56.14	0.4605

Table F29 Release of theophylline from the blend film with 50% CM-chitin content at pH 7.2

Time (minutes)	Amount of drug release (%)			Average	Standard deviation
	X1	X2	X3		
0.5	30.55	30.59	30.48	30.54	0.0601
1.0	46.60	46.64	46.27	46.51	0.2025
1.5	47.20	47.74	46.92	47.29	0.4187
2.0	47.66	47.74	47.23	47.54	0.2771
2.5	49.39	49.08	49.20	49.22	0.1554
3.0	49.57	49.31	49.26	49.38	0.1689
3.5	49.73	49.82	49.57	49.71	0.1272
4.0	50.50	50.65	50.58	50.58	0.0768
4.5	50.64	50.65	50.80	50.70	0.0907
5.0	51.17	50.97	51.51	51.22	0.2751
7.5	51.40	51.11	52.16	51.56	0.5409
10	52.22	52.32	51.88	52.14	0.2296
15	52.55	52.94	52.76	52.75	0.1955
20	53.58	53.31	53.13	53.34	0.2246
25	53.59	53.32	53.32	53.41	0.1571
30	53.82	52.07	51.08	52.32	1.3885
40	54.87	55.01	54.90	54.92	0.0738
50	55.13	55.41	55.30	55.28	0.1409
60	55.52	55.80	55.73	55.68	0.1464
120	55.61	57.22	57.03	56.62	0.8772

Table F30 Release of thycephylline from the blend film with 40% CM-chitin content at pH 7.2

Time (minutes)	Amount of drug release (%)			Average	Standard deviation
	X1	X2	X3		
0.5	39.65	39.71	40.79	40.05	0.6411
1.0	43.71	43.52	43.70	43.64	0.1108
1.5	45.81	45.80	45.75	45.78	0.0304
2.0	46.40	46.61	45.97	46.33	0.3236
2.5	47.04	46.87	46.91	46.94	0.0910
3.0	47.47	47.53	47.54	47.51	0.0369
3.5	47.74	47.64	47.66	47.68	0.0554
4.0	47.54	47.72	47.75	47.67	0.1136
4.5	47.82	47.84	47.79	47.82	0.0282
5.0	47.93	47.90	47.89	47.91	0.0184
7.5	47.95	48.00	48.03	47.99	0.0420
10	48.01	47.95	48.09	48.02	0.0735
15	48.20	48.05	48.22	48.16	0.0913
20	48.39	48.29	48.27	48.32	0.0648
25	48.60	48.37	48.62	48.53	0.1371
30	48.71	48.46	48.62	48.60	0.1279
40	48.90	48.86	48.75	48.84	0.0766
50	49.11	49.08	48.79	48.99	0.1738
60	49.80	50.66	50.86	50.44	0.5644
120	53.67	51.27	52.91	52.62	1.2274

Table F31 Release of diclofenac sodium from CM-chitin films at pH 2.0

Time (minutes)	Amount of drug release (%)			Average	Standard deviation
	X1	X2	X3		
0.5	3.56	3.31	3.50	3.46	0.1302
1.0	4.59	5.00	5.09	4.89	0.2660
1.5	5.13	5.01	5.14	5.09	0.0723
2.0	6.65	6.24	5.92	6.27	0.3672
2.5	6.87	7.00	6.17	6.68	0.4491
3.0	7.27	7.14	6.79	7.06	0.2500
3.5	7.64	8.47	8.69	8.27	0.5567
4.0	9.83	10.01	9.39	9.75	0.3170
4.5	10.10	10.23	10.02	10.12	0.1040
5.0	12.78	12.65	11.93	12.45	0.4575
7.5	29.05	24.53	25.10	26.23	2.4576
10	29.15	26.10	28.15	27.80	1.5542
15	28.93	26.95	28.55	28.14	1.0497
20	29.32	29.51	29.05	29.29	0.2359
25	29.47	29.59	30.00	29.69	0.2770
30	34.47	36.31	37.65	36.14	1.5969
40	39.25	40.80	40.61	40.22	0.8472
50	42.44	43.32	44.14	43.30	0.8502
60	52.43	53.65	54.84	53.64	1.2017
120	50.78	52.70	65.54	56.34	8.0236

Table F32 Release of diclofenac sodium from the blend films with 80% CM-chitin content at pH 2.0

Time (minutes)	Amount of drug release (%)			Average	Standard deviation
	X1	X2	X3		
0.5	5.23	6.24	5.63	5.70	0.5096
1.0	8.51	9.13	8.82	8.82	0.3077
1.5	10.02	11.06	10.76	10.61	0.5345
2.0	14.39	15.01	14.82	14.74	0.3151
2.5	16.13	18.41	18.16	17.57	1.2458
3.0	18.16	19.61	20.34	19.37	1.1113
3.5	23.26	24.06	24.93	24.08	0.8355
4.0	26.20	27.59	28.01	27.27	0.9448
4.5	30.10	29.47	29.98	29.85	0.3351
5.0	32.69	33.81	35.36	33.95	1.3396
7.5	34.16	35.10	36.04	35.10	0.9379
10	35.39	37.40	36.45	36.41	1.0043
15	37.46	39.14	37.93	38.18	0.8698
20	38.34	42.28	40.80	40.47	1.9940
25	40.20	42.51	42.44	41.72	1.3162
30	43.86	44.32	44.27	44.15	0.2506
40	45.83	47.20	47.16	46.73	0.7829
50	47.32	48.04	47.57	47.64	0.3646
60	50.21	50.81	50.57	50.53	0.3028
120	52.01	51.99	51.41	51.80	0.3427

Table F33 Release of diclofenac sodium from the blend films with 60% CM-chitin content at pH 2.0

Time (minutes)	Amount of drug release (%)			Average	Standard deviation
	X1	X2	X3		
0.5	14.68	16.43	14.85	15.32	0.9637
1.0	22.14	21.37	19.52	21.01	1.3475
1.5	24.06	22.51	21.12	22.56	1.4735
2.0	24.53	23.34	22.70	23.53	0.9292
2.5	25.53	25.97	24.61	25.37	0.6956
3.0	27.46	26.69	27.04	27.06	0.3889
3.5	27.89	27.68	28.46	28.01	0.4025
4.0	28.83	28.15	28.96	28.65	0.4323
4.5	29.07	29.50	29.84	29.47	0.3819
5.0	29.98	30.39	30.03	30.13	0.2253
7.5	30.70	29.91	30.99	30.54	0.5610
10	33.06	32.55	33.32	32.98	0.3949
15	35.63	35.11	35.74	35.49	0.3351
20	37.78	37.27	38.12	37.72	0.4280
25	40.23	40.87	39.54	40.21	0.6669
30	41.37	42.12	42.51	42.00	0.5805
40	44.58	45.46	46.51	45.52	0.9685
50	47.57	47.22	48.01	47.60	0.3965
60	49.08	49.02	49.69	49.26	0.3734
120	50.13	50.72	52.38	51.08	1.1628

Table F34 Release of diclofenac sodium from the blend films with 50% CM-chitin content at pH 2.0

Time (minutes)	Amount of drug release (%)			Average	Standard deviation
	X1	X2	X3		
0.5	11.81	14.30	14.85	13.65	1.6178
1.0	16.31	17.78	19.52	17.87	1.6067
1.5	18.80	18.42	19.87	19.03	0.7522
2.0	25.88	24.55	23.14	24.52	1.3704
2.5	28.08	28.61	27.05	27.91	0.7899
3.0	30.31	29.94	28.91	29.72	0.7217
3.5	29.34	31.08	31.45	30.62	1.1276
4.0	31.20	32.43	32.25	31.96	0.6658
4.5	31.61	32.69	33.35	32.55	0.8805
5.0	31.99	32.87	33.50	32.79	0.7581
7.5	34.59	33.35	34.06	34.00	0.6176
10	35.11	34.31	34.80	34.74	0.4067
15	35.10	34.50	35.63	35.07	0.5646
20	37.47	35.36	36.04	36.29	1.0778
25	38.35	37.75	36.46	37.52	0.9659
30	41.00	39.20	39.04	39.75	1.0902
40	41.15	40.20	41.38	40.91	0.6287
50	43.13	42.23	42.67	42.68	0.4470
60	50.16	48.98	47.10	48.75	1.5443
120	56.35	54.90	53.37	54.87	1.4876

Table F35 Release of diclofenac sodium from the blend films with 40% CM-chitin content at pH 2.0

Time (minutes)	Amount of drug release (%)			Average	Standard deviation
	X1	X2	X3		
0.5	3.49	3.34	2.96	3.26	0.2731
1.0	4.41	4.34	4.56	4.44	0.1119
1.5	4.88	4.70	4.67	4.75	0.1110
2.0	5.86	5.82	5.55	5.74	0.1698
2.5	7.05	6.96	7.20	7.07	0.1185
3.0	8.00	8.09	7.83	7.97	0.1343
3.5	8.53	8.41	8.31	8.42	0.1100
4.0	10.39	10.17	9.88	10.15	0.2573
4.5	11.05	10.86	10.73	10.88	0.1621
5.0	11.93	11.74	11.52	11.73	0.2053
7.5	14.17	13.98	13.94	14.03	0.1246
10	17.85	16.46	16.94	17.08	0.7068
15	20.68	20.43	20.27	20.46	0.2067
20	21.32	21.04	21.44	21.27	0.2032
25	22.26	22.10	22.39	22.25	0.1468
30	26.70	26.13	26.31	26.38	0.2927
40	26.76	27.84	28.18	27.59	0.7428
50	37.50	36.31	37.31	37.04	0.6375
60	40.46	39.55	40.80	40.27	0.6443
120	44.14	44.30	44.48	44.31	0.1686

Table F36 Release of diclofenac sodium from CM-chitin films at pH 5.5

Time (minutes)	Amount of drug release (%)			Average	Standard deviation
	X1	X2	X3		
0.5	26.64	23.14	25.88	25.22	1.8420
1.0	27.05	27.46	26.76	27.09	0.3533
1.5	27.73	29.22	29.15	28.70	0.8427
2.0	29.35	29.76	30.85	29.99	0.7723
2.5	29.84	31.86	31.87	31.19	1.1719
3.0	30.01	33.50	33.10	32.21	1.9097
3.5	31.84	33.57	33.13	32.85	0.8988
4.0	32.55	34.22	33.12	33.30	0.8491
4.5	33.03	34.85	34.75	34.21	1.0208
5.0	34.69	35.23	35.99	35.30	0.6552
7.5	35.10	36.02	37.40	36.17	1.1578
10	35.68	37.00	37.91	36.87	1.1200
15	38.89	39.19	38.76	38.95	0.2175
20	40.80	39.68	39.54	40.01	0.6892
25	45.46	43.13	41.97	43.52	1.7764
30	46.68	47.69	46.41	46.92	0.6730
40	49.18	48.64	47.72	48.51	0.7409
50	50.24	49.52	49.09	49.62	0.5778
60	51.47	50.24	50.13	50.61	0.7421
120	55.26	53.21	53.91	54.13	1.0426

Table F37 Release of diclofenac sodium from the blend films with 80% CM-chitin content at pH 5.5

Time (minutes)	Amount of drug release (%)			Average	Standard deviation
	X1	X2	X3		
0.5	3.75	5.36	3.43	4.18	1.0364
1.0	8.40	9.55	9.92	9.29	0.7955
1.5	12.78	12.95	13.10	12.95	0.1614
2.0	14.67	14.99	15.46	15.04	0.3979
2.5	16.55	16.94	18.20	17.23	0.8648
3.0	18.70	18.25	19.08	18.67	0.4182
3.5	24.24	23.49	25.98	24.57	1.2784
4.0	27.30	25.56	26.88	26.58	0.9093
4.5	28.90	27.43	29.34	28.56	0.9975
5.0	34.26	32.90	33.50	33.55	0.6830
7.5	35.70	35.19	35.73	35.54	0.3050
10	35.79	34.98	36.94	35.90	0.9871
15	36.15	35.23	37.35	36.25	1.0655
20	39.63	39.25	39.32	39.40	0.2022
25	40.58	39.64	41.12	40.45	0.7488
30	42.51	42.28	42.12	42.30	0.1990
40	45.46	44.55	43.74	44.58	0.8578
50	46.53	47.50	46.35	46.79	0.6155
60	48.71	49.02	49.18	48.97	0.2383
120	50.13	51.31	50.79	50.74	0.5877

Table F38 Release of diclofenac sodium from the blend films with 60% CM-chitin content at pH 5.5

Time (minutes)	Amount of drug release (%)			Average	Standard deviation
	X1	X2	X3		
0.5	1.70	1.83	1.60	1.71	0.1175
1.0	5.14	4.32	4.89	4.79	0.4208
1.5	5.28	5.22	5.06	5.18	0.1138
2.0	14.30	13.00	12.47	13.26	0.9430
2.5	14.89	16.46	12.29	14.54	2.1068
3.0	16.69	16.75	18.22	17.22	0.8635
3.5	17.03	17.22	19.24	17.83	1.2263
4.0	18.54	17.76	19.33	18.54	0.7840
4.5	19.62	20.75	20.90	20.42	0.6977
5.0	22.73	23.62	23.10	23.15	0.4494
7.5	26.76	26.31	26.35	26.47	0.2506
10	28.18	27.87	28.02	28.02	0.1540
15	35.39	34.38	35.19	34.99	0.5345
20	37.50	35.86	35.85	36.40	0.9519
25	39.19	38.48	39.96	39.21	0.7404
30	41.71	40.83	43.25	41.93	1.2239
40	42.92	44.14	43.57	43.54	0.6086
50	43.98	47.06	44.27	45.10	1.6985
60	45.78	47.67	48.39	47.28	1.3475
120	55.04	56.77	58.90	56.90	1.9305

Table F39 Release of diclofenac sodium from the blend films with 50% CM-chitin content at pH 5.5

Time (minutes)	Amount of drug release (%)			Average	Standard deviation
	X1	X2	X3		
0.5	3.49	3.30	3.11	3.30	0.1905
1.0	4.41	4.07	4.17	4.22	0.1736
1.5	4.88	4.75	47.10	18.91	24.4140
2.0	5.86	5.77	5.67	5.77	0.0953
2.5	7.05	6.62	6.96	6.88	0.2243
3.0	8.00	7.71	7.93	7.88	0.1525
3.5	8.53	8.12	8.41	8.35	0.2114
4.0	10.39	9.94	8.69	9.67	0.8801
4.5	11.93	11.49	11.81	11.74	0.2277
5.0	14.17	13.42	12.88	13.49	0.6475
7.5	18.73	17.26	1.64	12.54	9.4707
10	25.18	24.31	2.45	17.31	12.8805
15	28.64	27.04	12.62	22.76	8.8229
20	29.50	28.96	29.32	29.26	0.2766
25	30.42	29.97	30.13	30.17	0.2303
30	31.87	30.58	31.23	31.23	0.6448
40	33.10	32.87	18.22	28.06	8.5294
50	36.42	35.83	36.81	36.35	0.4940
60	37.72	37.53	38.31	37.85	0.4048
120	44.14	43.60	42.15	43.29	1.0305

Table F40 Release of diclofenac sodium from the blend films with 40% CM-chitin content at pH 5.5

Time (minutes)	Amount of drug release (%)			Average	Standard deviation
	X1	X2	X3		
0.5	0.18	0.82	1.14	0.71	0.4925
1.0	1.27	1.89	2.29	1.82	0.5096
1.5	2.83	2.74	2.97	2.85	0.1185
2.0	3.40	3.28	3.53	3.40	0.1246
2.5	5.09	5.26	4.89	5.08	0.1832
3.0	6.99	6.61	6.77	6.79	0.1913
3.5	8.44	7.96	7.90	8.10	0.2976
4.0	8.78	8.60	8.41	8.60	0.1832
4.5	10.40	10.60	10.19	10.40	0.2053
5.0	12.32	12.22	11.59	12.05	0.3968
7.5	12.78	12.59	12.40	12.59	0.1905
10	14.17	13.80	13.00	13.66	0.5998
15	16.46	16.63	1.54	11.54	8.6644
20	18.73	17.54	17.40	17.89	0.7313
25	20.85	20.44	20.59	20.63	0.2079
30	22.92	23.07	23.49	23.16	0.2969
40	25.73	24.71	25.16	25.20	0.5140
50	28.90	27.64	28.68	28.41	0.6732
60	29.37	29.65	29.66	29.56	0.1651
120	30.57	30.31	30.73	30.54	0.2145

Table F41 Release of diclofenac sodium from CM-chitin films at pH 7.2

Time (minutes)	Amount of drug release (%)			Average	Standard deviation
	X1	X2	X3		
0.5	38.35	34.38	36.31	36.35	1.9859
1.0	39.01	35.93	37.27	37.40	1.5433
1.5	39.26	36.61	37.91	37.93	1.3263
2.0	39.82	37.38	38.34	38.51	1.2258
2.5	40.56	40.26	39.04	39.95	0.8059
3.0	41.08	41.85	40.93	41.29	0.4962
3.5	41.81	42.12	41.44	41.79	0.3375
4.0	42.40	42.78	42.40	42.52	0.2200
4.5	43.03	44.13	43.99	43.71	0.6001
5.0	44.30	44.64	45.88	44.94	0.8337
7.5	46.51	45.88	47.26	46.55	0.6896
10	47.23	47.73	48.51	47.82	0.6425
15	49.05	48.58	50.24	49.29	0.8535
20	50.97	50.81	51.97	51.25	0.6271
25	52.33	52.04	53.59	52.65	0.8254
30	53.68	53.83	54.88	54.13	0.6556
40	55.86	56.93	56.92	56.57	0.6135
50	58.93	57.97	57.97	58.29	0.5500
60	62.09	60.29	58.24	60.21	1.9284
120	64.54	63.78	62.55	63.62	1.0057

Table F42 Release of diclofenac sodium from the blend films with 80% CM-chitin content at pH 7.2

Time (minutes)	Amount of drug release (%)			Average	Standard deviation
	X1	X2	X3		
0.5	4.24	4.85	4.41	4.50	0.3170
1.0	12.84	13.70	14.00	13.51	0.6019
1.5	14.93	14.99	15.42	15.11	0.2639
2.0	15.28	16.15	18.07	16.50	1.4251
2.5	19.40	20.56	21.19	20.38	0.9068
3.0	21.03	22.36	22.89	22.09	0.9592
3.5	23.99	24.66	25.25	24.63	0.6307
4.0	27.43	26.36	27.46	27.09	0.6263
4.5	29.69	29.54	31.10	30.11	0.8577
5.0	32.93	33.52	34.80	33.75	0.9596
7.5	36.17	37.27	37.87	37.10	0.8621
10	38.06	38.85	39.01	38.64	0.5098
15	39.33	40.87	40.34	40.18	0.7819
20	42.25	43.74	43.73	43.24	0.8588
25	43.55	43.99	43.76	43.77	0.2200
30	45.78	47.60	46.50	46.63	0.9152
40	49.23	49.40	48.38	49.00	0.5486
50	50.59	51.25	52.41	51.41	0.9199
60	53.78	54.56	54.88	54.41	0.5650
120	55.32	55.45	54.38	55.05	0.5833

Table F43 Release of diclofenac sodium from the blend films with 60% CM-chitin content at pH 7.2

Time (minutes)	Amount of drug release (%)			Average	Standard deviation
	X1	X2	X3		
0.5	22.33	21.95	22.60	22.29	0.3242
1.0	25.73	24.53	24.37	24.88	0.7447
1.5	27.46	26.17	24.72	26.12	1.3710
2.0	28.66	28.01	26.73	27.80	0.9834
2.5	29.47	28.99	28.66	29.04	0.4057
3.0	29.91	29.63	29.12	29.55	0.4014
3.5	30.42	30.13	30.09	30.21	0.1832
4.0	30.99	30.64	31.61	31.08	0.4896
4.5	31.62	31.46	33.40	32.16	1.0734
5.0	32.21	32.65	33.72	32.86	0.7763
7.5	32.91	33.87	34.42	33.74	0.7633
10	36.27	35.05	36.39	35.90	0.7385
15	37.02	36.17	36.80	36.66	0.4412
20	40.27	39.23	40.67	40.06	0.7418
25	42.12	40.36	41.08	41.18	0.8842
30	44.32	43.72	44.02	44.02	0.3004
40	47.50	45.59	47.85	46.98	1.2142
50	48.67	47.58	49.14	48.46	0.7968
60	50.13	49.62	50.57	50.11	0.4768
120	51.91	51.63	52.80	52.11	0.6125

Table F44 Release of diclofenac sodium from the blend films with 50% CM-chitin content at pH 7.2

Time (minutes)	Amount of drug release (%)			Average	Standard deviation
	X1	X2	X3		
0.5	12.98	11.96	12.49	12.48	0.5130
1.0	13.23	12.43	14.00	13.22	0.7841
1.5	15.17	15.31	15.26	15.25	0.0738
2.0	15.89	16.55	16.44	16.29	0.3549
2.5	16.46	17.26	16.94	16.89	0.4057
3.0	17.20	18.14	18.70	18.02	0.7554
3.5	18.20	18.38	19.24	18.61	0.5569
4.0	20.05	21.13	21.37	20.85	0.7036
4.5	21.38	22.63	22.48	22.16	0.6808
5.0	22.88	24.00	27.48	24.79	2.3983
7.5	26.20	27.02	27.65	26.96	0.7275
10	28.22	29.49	29.32	29.01	0.6859
15	32.87	34.69	35.73	34.43	1.4463
20	36.04	37.31	37.62	36.99	0.8392
25	40.53	41.85	41.68	41.36	0.7161
30	43.58	44.90	44.01	44.16	0.6732
40	45.75	46.09	45.62	45.82	0.2418
50	48.71	48.45	48.59	48.59	0.1322
60	50.15	50.21	50.08	50.14	0.0661
120	52.27	51.70	52.07	52.01	0.2895

Table F45 Release of diclofenac sodium from the blend films with 40% CM-chitin content at pH 7.2

Time (minutes)	Amount of drug release (%)			Average	Standard deviation
	X1	X2	X3		
0.5	28.21	29.06	28.59	28.62	0.4258
1.0	31.87	29.56	32.77	31.40	1.6563
1.5	36.93	35.99	37.24	36.72	0.6489
2.0	37.63	37.31	38.73	37.89	0.7453
2.5	39.23	38.06	39.39	38.89	0.7278
3.0	39.44	39.16	39.48	39.36	0.1748
3.5	40.37	39.96	40.75	40.36	0.3958
4.0	40.68	40.83	41.08	40.86	0.2001
4.5	41.09	41.21	41.43	41.24	0.1711
5.0	41.71	41.60	41.87	41.73	0.1330
7.5	42.45	41.85	42.13	42.15	0.3007
10	43.11	42.41	42.67	42.73	0.3553
15	43.30	43.11	43.13	43.18	0.1060
20	44.17	43.57	44.13	43.95	0.3350
25	44.36	44.14	46.09	44.86	1.0675
30	45.80	45.36	46.95	46.04	0.8251
40	47.60	45.81	47.50	46.97	1.0039
50	47.76	47.83	47.70	47.76	0.0661
60	48.54	48.61	48.43	48.53	0.0883
120	51.45	50.81	51.34	51.20	0.3435

Table F46 Release of amoxicillin trihydrate from CM-chitin films at pH 2.0

Time (minutes)	Amount of drug release (%)			Average	Standard deviation
	X1	X2	X3		
0.5	9.62	9.97	9.26	9.62	0.3524
1.0	11.07	11.46	11.46	11.33	0.2209
1.5	11.34	11.96	11.68	11.66	0.3126
2.0	12.02	12.16	11.90	12.03	0.1310
2.5	12.26	12.40	12.54	12.40	0.1410
3.0	12.56	12.75	12.67	12.66	0.0908
3.5	13.03	13.27	13.09	13.13	0.1257
4.0	13.71	13.59	13.83	13.71	0.1208
4.5	13.83	13.69	13.95	13.83	0.1310
5.0	13.93	14.03	14.24	14.07	0.1538
7.5	14.34	14.66	14.80	14.60	0.2374
10	14.56	14.52	14.98	14.69	0.2565
15	14.72	14.74	15.00	14.82	0.1573
20	16.13	15.08	15.75	15.65	0.5298
25	16.61	15.59	16.15	16.12	0.5143
30	16.75	16.07	16.73	16.52	0.3896
40	16.97	16.33	16.83	16.71	0.3387
50	18.18	17.20	17.10	17.49	0.6008
60	19.03	17.78	17.54	18.12	0.7997
120	20.76	21.22	20.38	20.79	0.4235

Table F47 Release of amoxicillin trihydrate from the blend films with 80%CM-chitin content at pH 2.0

Time (minutes)	Amount of drug release (%)			Average	Standard deviation
	X1	X2	X3		
0.5	5.60	6.06	5.38	5.68	0.3493
1.0	6.28	6.54	6.20	6.34	0.1790
1.5	6.89	6.83	6.50	6.74	0.2057
2.0	7.95	7.73	7.03	7.57	0.4837
2.5	8.32	8.78	7.89	8.33	0.4431
3.0	9.10	9.40	9.04	9.18	0.1942
3.5	9.06	9.52	9.81	9.46	0.3762
4.0	9.48	9.71	9.91	9.70	0.2115
4.5	9.71	9.91	10.09	9.90	0.1914
5.0	9.89	10.33	10.53	10.25	0.3296
7.5	10.53	10.91	10.73	10.73	0.1914
10	11.64	11.46	10.91	11.34	0.3772
15	11.94	11.76	11.42	11.71	0.2659
20	12.32	12.50	11.80	12.21	0.3660
25	12.73	12.95	12.54	12.74	0.2017
30	12.87	13.11	13.05	13.01	0.1257
40	12.99	13.47	13.57	13.34	0.3122
50	13.67	13.81	13.79	13.76	0.0762
60	14.26	14.62	14.34	14.40	0.1903
120	15.79	16.01	16.13	15.97	0.1736

Table F48 Release of amoxicillin trihydrate from the blend films with 60% CM-chitin content at pH 2.0

Time (minutes)	Amount of drug release (%)			Average	Standard deviation
	X1	X2	X3		
0.5	5.05	4.49	4.99	4.85	0.3096
1.0	5.30	4.85	4.71	4.95	0.3047
1.5	5.40	5.15	5.32	5.29	0.1230
2.0	5.52	5.46	5.66	5.54	0.1033
2.5	5.82	5.72	5.90	5.81	0.0908
3.0	6.28	5.98	6.40	6.22	0.2178
3.5	6.69	6.28	6.87	6.61	0.2989
4.0	6.95	6.95	7.77	7.22	0.4766
4.5	6.89	7.35	7.95	7.40	0.5352
5.0	7.99	7.53	8.18	7.90	0.3323
7.5	8.32	7.67	8.42	8.13	0.4042
10	8.56	8.20	8.50	8.42	0.1942
15	9.18	8.76	8.62	8.85	0.2934
20	9.50	9.10	8.46	9.02	0.5282
25	9.77	9.65	9.12	9.51	0.3425
30	10.29	9.97	9.56	9.94	0.3632
40	10.65	10.31	10.53	10.50	0.1736
50	11.64	11.20	10.99	11.28	0.3296
60	11.96	11.64	11.70	11.77	0.1713
120	13.51	12.95	13.15	13.20	0.2857

Table F49 Release of amoxicillin trihydrate from the blend films with 50% CM-chitin content at pH 2.0

Time (minutes)	Amount of drug release (%)			Average	Standard deviation
	X1	X2	X3		
0.5	7.25	4.89	6.73	6.29	1.2371
1.0	7.77	7.11	7.67	7.52	0.3581
1.5	8.46	8.50	8.09	8.35	0.2218
2.0	8.62	8.74	8.38	8.58	0.1845
2.5	9.30	8.52	8.54	8.79	0.4477
3.0	8.88	8.58	8.84	8.77	0.1640
3.5	9.22	8.50	8.64	8.79	0.3843
4.0	9.28	8.68	8.82	8.93	0.3160
4.5	9.38	8.82	8.88	9.03	0.3096
5.0	9.44	8.92	8.92	9.09	0.3023
7.5	9.50	9.28	9.08	9.29	0.2115
10	9.54	9.42	9.24	9.40	0.1520
15	9.65	9.50	9.40	9.52	0.1214
20	9.73	9.69	9.54	9.65	0.0952
25	9.93	9.65	9.71	9.76	0.1484
30	10.05	9.81	9.73	9.86	0.1677
40	10.09	9.93	9.89	9.97	0.1065
50	10.25	10.13	10.03	10.14	0.1109
60	10.23	10.35	10.25	10.28	0.0647
120	10.29	10.23	10.49	10.34	0.1371

Table F50 Release of amoxicillin trihydrate from the blend films with 40% CM-chitin content at pH 2.0

Time (minutes)	Amount of drug release (%)			Average	Standard deviation
	X1	X2	X3		
0.5	2.42	2.54	2.60	2.52	0.0923
1.0	2.67	2.60	2.72	2.66	0.0607
1.5	2.98	2.74	2.80	2.84	0.1272
2.0	3.25	2.92	2.86	3.01	0.2086
2.5	3.39	3.18	2.96	3.18	0.2127
3.0	3.64	3.40	3.14	3.39	0.2481
3.5	3.79	3.52	3.26	3.52	0.2630
4.0	4.30	3.77	3.58	3.88	0.3744
4.5	4.51	3.93	3.91	4.11	0.3402
5.0	4.83	4.53	4.85	4.74	0.1805
7.5	5.01	4.71	4.93	4.88	0.1544
10	5.06	4.97	5.01	5.02	0.0428
15	5.39	5.26	5.15	5.27	0.1161
20	5.73	5.54	5.78	5.68	0.1270
25	6.12	5.66	5.92	5.90	0.2298
30	7.14	6.46	6.93	6.84	0.3444
40	7.50	7.17	7.09	7.25	0.2188
50	7.85	6.95	7.39	7.40	0.4531
60	8.28	7.53	7.95	7.92	0.3760
120	9.10	8.60	8.90	8.87	0.2522

Table F51 Release of amoxicillin trihydrate from CM-chitin films at pH 5.5

Time (minutes)	Amount of drug release (%)			Average	Standard deviation
	X1	X2	X3		
0.5	2.58	3.08	3.95	3.20	0.6926
1.0	3.34	3.66	4.05	3.68	0.3528
1.5	4.69	4.71	4.51	4.64	0.1109
2.0	4.85	4.79	4.75	4.80	0.0507
2.5	5.54	5.22	5.30	5.35	0.1677
3.0	5.64	5.68	5.62	5.64	0.0308
3.5	5.90	6.00	5.76	5.89	0.1214
4.0	6.46	6.36	6.77	6.53	0.2096
4.5	6.97	6.69	7.07	6.91	0.1970
5.0	7.21	7.11	6.99	7.10	0.1109
7.5	7.31	7.53	7.21	7.35	0.1648
10	7.91	7.69	7.61	7.74	0.1564
15	8.22	8.09	8.36	8.22	0.1310
20	8.76	8.88	8.58	8.74	0.1520
25	8.94	9.12	8.68	8.91	0.2227
30	10.09	9.93	9.79	9.93	0.1511
40	10.91	10.59	11.16	10.89	0.2829
50	11.86	11.60	12.12	11.86	0.2618
60	12.93	12.87	13.97	13.26	0.6227
120	17.60	18.77	21.87	19.41	2.2061

Table F52 Release of amoxicillin trihydrate from the blend films with 80% CM-chitin content at pH 5.5

Time (minutes)	Amount of drug release (%)			Average	Standard deviation
	X1	X2	X3		
0.5	5.15	5.26	4.87	5.09	0.1983
1.0	5.42	5.78	5.42	5.54	0.2093
1.5	5.96	6.28	5.78	6.01	0.2550
2.0	6.52	6.56	5.96	6.35	0.3377
2.5	6.89	7.07	6.83	6.93	0.1257
3.0	7.07	7.43	6.89	7.13	0.2768
3.5	7.77	7.61	7.99	7.79	0.1921
4.0	7.99	8.30	8.50	8.26	0.2534
4.5	8.64	8.76	8.96	8.79	0.1628
5.0	9.20	8.92	9.30	9.14	0.1983
7.5	9.71	9.97	9.89	9.85	0.1341
10	10.31	10.61	10.33	10.42	0.1689
15	10.53	10.93	10.83	10.77	0.2096
20	10.91	11.30	11.20	11.14	0.1983
25	11.16	11.22	11.42	11.26	0.1371
30	11.82	11.90	12.14	11.95	0.1677
40	12.14	12.63	12.71	12.49	0.3049
50	12.77	12.93	13.03	12.91	0.1320
60	13.59	13.23	13.35	13.39	0.1845
120	14.62	14.96	15.18	14.92	0.2840

Table F53 Release of amoxicillin trihydrate from the blend films with 60% CM-chitin content at pH 5.5

Time (minutes)	Amount of drug release (%)			Average	Standard deviation
	X1	X2	X3		
0.5	4.49	4.33	3.97	4.26	0.2681
1.0	4.85	4.65	4.41	4.64	0.2218
1.5	4.99	4.89	4.65	4.85	0.1759
2.0	5.11	5.28	5.09	5.16	0.0993
2.5	5.50	5.22	4.99	5.24	0.2523
3.0	6.06	5.40	5.22	5.56	0.4453
3.5	6.32	5.78	5.66	5.92	0.3540
4.0	6.56	6.46	6.52	6.52	0.0507
4.5	6.83	6.69	6.97	6.83	0.1410
5.0	6.95	7.17	7.27	7.13	0.1648
7.5	7.57	7.41	7.35	7.44	0.1145
10	8.62	7.83	7.61	8.02	0.5291
15	9.00	8.60	7.95	8.52	0.5282
20	9.71	9.12	8.52	9.11	0.5940
25	10.09	9.81	8.88	9.59	0.6321
30	10.43	10.09	9.71	10.07	0.3626
40	10.53	10.53	10.39	10.48	0.0814
50	11.01	11.12	10.63	10.92	0.2550
60	11.30	11.44	11.14	11.29	0.1511
120	12.56	11.96	11.76	12.09	0.4192

Table F54 Release of amoxicillin trihydrate from the blend films with 50% CM-chitin content at pH 5.5

Time (minutes)	Amount of drug release (%)			Average	Standard deviation
	X1	X2	X3		
0.5	5.86	5.44	5.94	5.75	0.2704
1.0	6.36	5.98	6.28	6.21	0.2017
1.5	7.59	7.83	6.87	7.43	0.5030
2.0	7.87	8.01	7.17	7.69	0.4531
2.5	8.07	8.22	7.61	7.97	0.3160
3.0	8.32	8.28	7.87	8.16	0.2450
3.5	8.60	8.48	7.79	8.29	0.4344
4.0	8.44	8.70	8.22	8.45	0.2419
4.5	8.64	8.80	8.44	8.62	0.1816
5.0	8.70	8.92	8.48	8.70	0.2215
7.5	8.82	9.08	8.74	8.88	0.1790
10	8.88	9.06	8.64	8.86	0.2121
15	9.10	9.24	8.58	8.97	0.3501
20	9.38	9.32	8.82	9.18	0.3096
25	9.50	9.40	9.04	9.32	0.2436
30	9.48	9.58	9.32	9.46	0.1320
40	9.75	9.75	9.42	9.64	0.1860
50	9.93	10.05	9.73	9.90	0.1628
60	10.31	10.95	9.91	10.39	0.5282
120	11.82	11.62	10.13	11.19	0.9239

Table F55 Release of amoxicillin trihydrate from the blend films with 40% CM-chitin content at pH 5.5

Time (minutes)	Amount of drug release (%)			Average	Standard deviation
	X1	X2	X3		
0.5	5.86	5.44	5.94	5.75	0.2704
0.5	2.17	2.56	2.32	2.35	0.1935
1.0	2.48	2.60	2.74	2.60	0.1310
1.5	2.58	2.66	2.86	2.70	0.1452
2.0	2.62	2.72	2.98	2.77	0.1871
2.5	2.70	2.78	3.08	2.85	0.2017
3.0	2.74	2.86	3.16	2.92	0.2178
3.5	2.78	2.98	3.26	3.01	0.2427
4.0	2.92	3.08	3.30	3.10	0.1921
4.5	3.04	3.38	3.40	3.28	0.2037
5.0	3.30	3.50	3.52	3.44	0.1225
7.5	3.52	3.75	3.81	3.69	0.1484
10	3.73	3.89	3.97	3.86	0.1230
15	3.87	4.17	4.39	4.14	0.2628
20	4.29	4.89	4.73	4.64	0.3128
25	4.77	5.11	5.01	4.97	0.1759
30	5.01	5.32	5.11	5.15	0.1538
40	5.15	5.54	5.30	5.33	0.1935
50	5.40	5.76	5.60	5.58	0.1816
60	5.92	6.34	6.56	6.28	0.3274
120	7.55	7.95	8.07	7.86	0.2741

Table F56 Release of amoxicillin trihydrate from CM-chitin films at pH 7.2

Time (minutes)	Amount of drug release (%)			Average	Standard deviation
	X1	X2	X3		
0.5	4.83	4.97	5.09	4.97	0.1310
1.0	6.12	6.58	6.40	6.37	0.2334
1.5	6.75	7.29	7.11	7.05	0.2768
2.0	6.87	7.21	7.07	7.05	0.1720
2.5	6.99	7.33	7.55	7.29	0.2841
3.0	7.53	7.29	7.79	7.54	0.2518
3.5	7.77	7.51	7.69	7.66	0.1341
4.0	8.36	8.42	8.58	8.45	0.1145
4.5	8.88	8.70	8.96	8.85	0.1341
5.0	8.96	9.22	9.28	9.16	0.1713
7.5	9.18	9.10	9.52	9.27	0.2245
10	9.50	9.99	9.81	9.77	0.2441
15	10.17	11.32	10.97	10.82	0.5892
20	11.09	12.04	11.72	11.62	0.4812
25	12.00	11.70	11.90	11.87	0.1538
30	12.79	11.84	12.58	12.40	0.4985
40	14.32	14.52	15.73	14.85	0.7623
50	16.55	16.15	18.10	16.93	1.0313
60	19.65	18.61	19.05	19.10	0.5256
120	23.20	22.95	20.98	22.38	1.2151

Table F57 Release of amoxicillin trihydrate from the blend films with 80% CM-chitin content at pH 7.2

Time (minutes)	Amount of drug release (%)			Average	Standard deviation
	X1	X2	X3		
0.5	6.00	6.10	5.72	5.94	0.1983
1.0	6.26	6.62	6.26	6.38	0.2093
1.5	6.81	7.13	6.62	6.85	0.2550
2.0	7.37	7.41	6.81	7.20	0.3377
2.5	7.73	7.91	7.67	7.77	0.1257
3.0	7.91	8.28	7.73	7.97	0.2768
3.5	8.62	8.46	8.84	8.64	0.1921
4.0	8.84	9.14	9.34	9.11	0.2534
4.5	9.48	9.60	9.81	9.63	0.1628
5.0	10.05	9.77	10.15	9.99	0.1983
7.5	10.55	10.81	10.73	10.70	0.1341
10	11.16	11.46	11.18	11.26	0.1689
15	11.38	11.78	11.68	11.61	0.2096
20	11.76	12.14	12.04	11.98	0.1983
25	12.00	12.06	12.26	12.11	0.1371
30	12.67	12.75	12.99	12.80	0.1677
40	12.99	13.47	13.55	13.34	0.3049
50	13.61	13.77	13.87	13.75	0.1320
60	14.44	14.08	14.20	14.24	0.1845
120	15.46	15.81	16.03	15.77	0.2841

Table F58 Release of amoxicillin trihydrate from the blend films with 60% CM-chitin content at pH 7.2

Time (minutes)	Amount of drug release (%)			Average	Standard deviation
	X1	X2	X3		
0.5	5.21	5.01	5.11	5.11	0.0987
1.0	5.22	5.05	5.38	5.22	0.1611
1.5	6.95	6.12	5.54	6.20	0.7082
2.0	7.23	6.89	6.66	6.93	0.2841
2.5	7.39	7.53	7.77	7.56	0.1935
3.0	7.73	7.75	8.18	7.89	0.2502
3.5	7.97	8.07	8.52	8.19	0.2892
4.0	9.06	8.70	8.88	8.88	0.1812
4.5	9.81	9.08	9.30	9.40	0.3715
5.0	9.99	9.81	9.81	9.87	0.1046
7.5	10.53	10.13	9.91	10.19	0.3165
10	10.75	10.69	10.49	10.65	0.1371
15	10.99	11.12	10.85	10.99	0.1310
20	11.26	11.54	11.50	11.43	0.1525
25	11.56	11.72	11.96	11.75	0.2027
30	11.92	12.22	12.42	12.19	0.2534
40	12.12	12.56	12.65	12.44	0.2819
50	12.44	12.83	12.77	12.68	0.2057
60	12.79	12.91	13.17	12.95	0.1956
120	14.18	14.48	14.03	14.23	0.2263

Table F59 Release of amoxicillin trihydrate from the blend films with 50% CM-chitin content at pH 7.2

Time (minutes)	Amount of drug release (%)			Average	Standard deviation
	X1	X2	X3		
0.5	5.86	5.94	5.20	5.66	0.4089
1.0	7.83	5.86	5.56	6.42	1.2358
1.5	8.18	7.33	7.79	7.77	0.4235
2.0	8.36	7.79	7.97	8.04	0.2878
2.5	8.96	8.24	8.32	8.50	0.3973
3.0	9.16	8.48	8.70	8.78	0.3493
3.5	9.40	8.78	9.69	9.29	0.4637
4.0	9.44	9.04	9.18	9.22	0.2044
4.5	9.42	9.42	9.50	9.45	0.0465
5.0	9.65	9.30	8.76	9.24	0.4468
7.5	9.69	9.48	9.50	9.56	0.1109
10	9.85	9.56	9.71	9.71	0.1410
15	9.91	9.95	9.69	9.85	0.1410
20	10.09	10.23	10.33	10.22	0.1214
25	10.25	10.35	10.55	10.38	0.1538
30	10.49	10.69	10.73	10.64	0.1295
40	10.71	10.67	10.81	10.73	0.0726
50	10.93	11.05	11.09	11.03	0.0838
60	11.62	11.30	11.52	11.48	0.1648
120	11.82	11.86	11.32	11.67	0.3029

Table F60 Release of amoxicillin trihydrate from the blend films with 40% CM-chitin content at pH 7.2

Time (minutes)	Amount of drug release (%)			Average	Standard deviation
	X1	X2	X3		
0.5	2.78	2.84	2.52	2.71	0.1713
1.0	2.92	3.08	2.78	2.93	0.1511
1.5	3.26	3.36	2.96	3.19	0.2096
2.0	3.50	3.42	3.08	3.34	0.2245
2.5	3.66	3.60	3.50	3.59	0.0814
3.0	3.75	3.68	3.87	3.77	0.0923
3.5	3.85	3.77	4.05	3.89	0.1452
4.0	4.29	3.93	4.45	4.22	0.2681
4.5	4.57	4.49	4.77	4.61	0.1452
5.0	5.11	4.99	4.97	5.03	0.0762
7.5	5.98	5.17	5.76	5.64	0.4161
10	6.22	5.72	6.06	6.00	0.2571
15	6.95	6.46	6.87	6.76	0.2589
20	7.17	6.89	7.13	7.06	0.1525
25	7.61	7.43	7.39	7.48	0.1180
30	7.87	7.79	7.63	7.77	0.1230
40	7.93	8.11	8.03	8.03	0.0908
50	8.22	8.40	8.52	8.38	0.1520
60	8.76	9.18	8.92	8.95	0.2134
120	9.81	9.93	9.56	9.77	0.1845

APPENDIX G

Effect of pH on Swelling Behavior

Table G1 Effect of time on degree of swelling of pure CM-chitin Film in pH buffer solution pH 2.0

Time (minutes)	Degree of swelling (%)				Standard Derivation
	X1	X2	X3	Average	
0.5	121.19	136.09	105.61	120.96	15.24
1.0	137.38	158.46	117.99	137.94	20.24
1.5	155.11	167.11	139.46	153.89	13.87
2.0	182.66	184.59	159.57	175.61	13.92
2.5	208.67	214.47	181.62	201.59	17.53
3.0	261.08	235.34	194.2	230.21	33.73
3.5	284.97	253.57	217.79	252.11	33.61
4.0	293.26	267.29	245.07	268.54	24.12
4.5	304.24	281.2	260.35	281.93	21.95
5.0	334.68	296.43	271.37	300.83	31.88
7.5	357.42	322.56	304.06	328.01	27.09
10	370.52	340.23	308.12	339.62	31.20
15	398.46	364.47	332.11	365.01	33.18
20	413.87	379.7	359.38	384.32	27.54
25	428.32	404.32	379.88	404.17	24.22
30	437.38	412.41	396.32	415.37	20.69
40	447.4	436.47	429.21	437.69	9.16
50	457.42	445.68	455.9	453.00	6.38
60	459.54	466.54	476.79	467.62	8.68
90	475.53	474.44	482.4	477.46	4.32
120	480.35	510.53	504.06	498.31	15.89

Table G2 Effect of time on degree of swelling of CM-chitin/silk fibroin blend films:
80/20 in pH buffer solution pH 2.0

Time (minutes)	Degree of swelling (%)				Standard Derivation
	X1	X2	X3	Average	
0.5	79.47	88.19	94.40	87.35	7.50
1.0	93.43	92.91	121.92	102.75	16.60
1.5	102.26	121.85	147.55	123.89	22.71
2.0	131.21	133.86	161.06	142.04	16.52
2.5	141.89	143.11	180.23	155.08	21.79
3.0	155.85	162.60	204.11	174.19	26.13
3.5	166.32	188.39	218.00	190.90	25.93
4.0	172.28	210.83	242.86	208.66	35.34
4.5	184.8	219.88	260.67	221.78	37.97
5.0	189.12	251.38	280.63	240.38	46.74
7.5	219.10	290.55	300.20	269.95	44.30
10	243.33	302.76	325.24	290.44	42.32
15	269.61	329.92	340.90	313.48	38.38
20	280.70	341.93	362.62	328.42	42.60
25	304.93	365.55	379.06	349.85	39.48
30	333.88	387.80	401.96	374.55	35.92
40	365.09	407.28	415.26	395.88	26.96
50	389.73	424.02	432.49	415.41	22.64
60	410.68	450.20	447.36	436.08	22.04
90	426.28	468.31	454.79	449.79	21.46
120	447.23	485.83	478.08	470.38	20.42

Table G3 Effect of time on degree of swelling of CM-chitin/silk fibroin blend films: 60/40 in pH buffer solution pH 2.0

Time (minutes)	Degree of swelling (%)				Standard derivation
	X1	X2	X3	Average	
0.5	30.28	35.94	40.91	35.71	5.32
1.0	42.03	50.80	55.14	49.32	6.68
1.5	56.18	75.50	69.17	66.95	9.85
2.0	83.86	83.13	80.24	82.41	1.91
2.5	94.82	97.79	92.69	95.10	2.56
3.0	120.12	103.82	108.70	110.88	8.37
3.5	131.67	115.86	121.94	123.16	7.97
4.0	143.63	126.51	151.78	140.64	12.90
4.5	152.59	147.99	159.49	153.36	5.79
5.0	165.14	170.28	174.51	169.98	4.69
7.5	188.45	189.36	187.15	188.32	1.11
10	203.39	213.65	211.46	209.50	5.40
15	233.47	227.91	224.51	228.63	4.52
20	267.53	249.80	252.57	256.63	9.54
25	214.14	272.49	266.80	251.14	32.17
30	229.48	283.94	290.12	267.85	33.37
40	247.01	322.29	297.83	289.04	38.40
50	269.72	342.77	317.79	310.09	37.13
60	286.65	371.29	343.68	333.87	43.16
90	307.37	390.56	353.95	350.63	41.69
120	317.93	404.42	363.44	361.93	43.26

Table G4 Effect of time on degree of swelling of CM-chitin/silk fibroin blend films: 50/50 in pH buffer solution pH 2.0

Time (minutes)	Degree of swelling (%)				Standard derivation
	X1	X2	X3	Average	
0.5	15.64	24.35	13.32	17.77	5.82
1.0	24.07	34.53	25.58	28.06	5.65
1.5	38.89	44.31	31.71	38.30	6.32
2.0	52.67	54.29	45.67	50.88	4.58
2.5	62.14	68.66	51.59	60.80	8.61
3.0	76.13	84.23	65.54	75.30	9.37
3.5	96.30	110.18	71.67	92.72	19.50
4.0	102.67	129.94	83.72	105.44	23.23
4.5	131.07	152.50	95.56	126.38	28.76
5.0	144.24	170.66	109.94	141.61	30.45
7.5	155.76	185.23	141.44	160.81	22.33
10	170.58	209.78	158.99	179.78	26.62
15	185.19	224.75	186.26	198.73	22.54
20	199.59	254.09	187.32	213.67	35.54
25	219.14	263.87	207.61	230.21	29.72
30	237.86	290.22	232.35	253.48	31.94
40	265.02	307.78	249.68	274.16	30.11
50	289.51	343.71	268.50	300.57	38.81
60	305.76	365.47	298.52	323.25	36.74
90	323.25	389.22	312.90	341.79	41.40
120	334.98	396.21	325.58	352.26	38.35

Table G5 Effect of time on degree of swelling of CM-chitin/silk fibroin blend films: 40/60 in pH buffer solution pH 2.0

Time (minutes)	Degree of swelling (%)				Standard derivation
	X1	X2	X3	Average	
0.5	26.88	14.44	11.58	17.63	8.13
1.0	37.47	23.41	18.93	26.60	9.67
1.5	45.01	30.63	26.50	34.05	9.72
2.0	53.97	33.92	30.73	39.54	12.60
2.5	60.69	49.89	36.97	49.18	11.88
3.0	63.95	58.64	46.77	56.45	8.80
3.5	74.34	71.55	52.12	66.00	12.10
4.0	79.02	80.31	63.47	74.27	9.37
4.5	83.10	90.15	75.06	82.77	7.55
5.0	85.74	94.97	88.20	89.64	4.78
7.5	99.80	101.97	105.57	102.45	2.91
10	107.94	107.00	125.39	113.44	10.36
15	121.18	114.66	150.56	128.80	19.12
20	128.72	123.85	174.83	142.47	28.13
25	153.77	131.07	199.78	161.54	35.01
30	169.86	141.14	221.38	177.46	40.66
40	189.82	152.95	239.87	194.21	43.63
50	205.09	169.58	267.04	213.90	49.32
60	218.33	181.40	297.33	232.35	59.22
90	230.55	194.53	302.23	242.44	54.83
120	256.82	203.06	320.27	260.05	58.67

Table G6 Effect of time on degree of swelling of pure CM-chitin Film in pH buffer solution pH 5.5

Time (minutes)	Degree of swelling (%)				Standard deviation
	X1	X2	X3	Average	
0.5	69.11	83.7	65.43	72.75	9.66
1.0	91.89	122.86	123.24	112.66	17.99
1.5	128.57	153.28	141.41	141.09	12.36
2.0	155.98	169.58	162.11	162.56	6.81
2.5	181.47	186.68	184.38	184.18	2.61
3.0	192.28	204.77	205.27	200.77	7.36
3.5	222.78	234.79	233.98	230.52	6.71
4.0	245.37	243.54	250.59	246.50	3.66
4.5	247.88	259.64	259.57	255.70	6.77
5.0	281.47	292.45	277.34	283.75	7.81
7.5	288.61	301.19	293.95	294.58	6.31
10	288.61	320.87	313.28	307.59	16.87
15	331.66	348.11	346.09	341.95	8.97
20	350.58	370.38	351.95	357.64	11.06
25	374.52	379.92	379.88	378.11	3.11
30	397.3	408.75	401.95	402.67	5.76
40	446.91	427.63	416.02	430.19	15.60
50	430.5	453.48	395.31	426.43	29.30
60	445.95	473.36	419.92	446.41	26.72
90	460.04	482.31	443.16	461.84	19.64
120	475.68	493.84	463.09	477.54	15.46

Table G7 Effect of time on degree of swelling of CM-chitin/silk fibroin blend films: 80/20 in pH buffer solution pH 5.5

Time (minutes)	Degree of swelling (%)				Standard derivation
	X1	X2	X3	Average	
0.5	52.27	72.17	90.04	71.49	18.89
1.0	64.50	89.46	107.42	87.13	21.55
1.5	74.95	96.42	119.53	96.97	22.30
2.0	82.45	109.54	125.2	105.73	21.63
2.5	101.58	114.31	133.98	116.62	16.32
3.0	111.64	123.26	142.77	125.89	15.73
3.5	117.36	145.92	151.37	138.22	18.27
4.0	131.56	155.67	154.69	147.31	13.65
4.5	143.79	167.00	168.75	159.85	13.93
5.0	156.02	174.35	180.08	170.15	12.57
7.5	165.09	182.90	203.52	183.84	19.23
10	191.52	213.72	226.76	210.67	17.82
15	200.20	228.63	238.87	222.57	20.04
20	220.32	254.87	263.67	246.29	22.91
25	247.93	274.75	277.34	266.67	16.28
30	267.46	292.45	361.13	307.01	48.50
40	281.46	308.55	370.90	320.30	45.86
50	291.52	328.63	383.98	334.710	46.53
60	300.99	346.32	396.29	347.87	47.67
90	319.33	374.16	405.27	366.25	43.51
120	331.95	384.29	408.40	374.88	39.08

Table G8 Effect of time on degree of swelling of CM-chitin/silk fibroin blend films: 60/40 in pH buffer solution pH 5.5

Time (minutes)	Degree of swelling (%)				Standard derivation
	X1	X2	X3	Average	
0.5	5.13	25.10	42.43	24.22	18.67
1.0	18.28	38.35	50.60	35.74	16.32
1.5	30.18	43.57	58.96	44.24	14.40
2.0	41.48	57.83	68.33	55.88	13.53
2.5	44.35	67.67	76.49	62.84	16.61
3.0	53.59	73.90	83.86	70.45	15.43
3.5	61.40	85.34	94.42	80.39	17.06
4.0	66.74	95.78	110.36	90.96	22.21
4.5	73.72	102.81	116.73	97.75	21.95
5.0	79.88	132.13	123.71	111.91	28.05
7.5	91.58	149.60	150.60	130.59	33.79
10	116.43	166.27	158.17	146.96	26.75
15	131.21	198.19	163.94	164.45	33.49
20	176.80	213.86	190.64	193.77	18.73
25	198.15	258.43	209.96	222.18	31.94
30	227.31	277.91	234.26	246.49	27.43
40	233.26	292.17	247.61	257.68	30.72
50	260.99	316.47	275.70	284.39	28.74
60	274.95	328.31	287.45	296.90	27.91
90	301.44	344.18	313.35	319.66	22.06
120	319.92	359.04	320.92	333.29	22.30

Table G9 Effect of time on degree of swelling of CM-chitin/silk fibroin blend films:
50/50 in pH buffer solution pH 5.5

Time (minutes)	Degree of swelling (%)				Standard derivation
	X1	X2	X3	Average	
0.5	7.17	8.03	14.74	9.98	4.14
1.0	19.67	10.57	23.37	17.87	6.59
1.5	27.66	23.89	31.16	27.57	3.64
2.0	41.19	29.39	42.74	37.77	7.30
2.5	52.05	42.71	56.00	50.25	6.82
3.0	62.09	57.51	65.47	61.69	4.00
3.5	68.65	66.81	79.58	71.68	6.90
4.0	78.07	74.00	92.21	81.43	9.56
4.5	95.08	105.50	106.74	102.44	6.40
5.0	125.82	123.26	115.37	121.48	5.45
7.5	156.76	150.74	144.84	150.78	5.96
10	171.52	169.56	170.53	170.54	0.98
15	187.30	187.95	188.21	187.82	0.47
20	214.75	216.07	200.00	210.27	8.92
25	240.78	231.50	229.05	233.78	6.19
30	265.16	251.59	255.16	257.30	7.03
40	300.82	270.40	269.05	280.09	17.97
50	334.63	293.87	283.79	304.10	26.92
60	321.93	308.46	308.84	313.08	7.67
90	329.30	315.86	320.63	321.93	6.81
120	332.79	331.92	329.26	331.32	1.84

Table G10 Effect of time on degree of swelling of CM-chitin/silk fibroin blend films: 40/60 in pH buffer solution pH 5.5

Time (minutes)	Degree of swelling (%)				Standard derivation
	X1	X2	X3	Average	
0.5	12.78	9.86	6.85	9.83	2.97
1.0	16.12	16.83	12.42	15.12	2.37
1.5	25.53	26.31	22.91	24.92	1.78
2.0	31.09	32.88	25.48	29.82	3.86
2.5	36.66	39.46	37.47	37.86	1.44
3.0	48.37	46.62	61.88	52.29	8.35
3.5	54.13	50.68	86.51	63.77	19.77
4.0	67.56	59.38	93.15	73.36	17.62
4.5	72.55	71.37	102.36	82.09	17.56
5.0	74.86	84.33	111.78	90.32	19.18
7.5	79.46	104.64	140.26	108.12	30.55
10	84.84	131.33	153.75	123.31	35.15
15	88.48	140.81	166.81	132.03	39.90
20	102.69	161.90	183.73	149.44	41.93
25	118.43	187.43	210.92	172.26	48.07
30	143.38	203.09	237.90	194.79	47.80
40	160.27	216.05	247.75	208.02	44.29
50	178.89	246.03	268.95	231.29	46.80
60	194.82	252.61	297.00	248.14	51.24
90	216.12	277.95	312.21	268.76	48.70
120	237.62	310.25	354.60	300.82	59.06

Table G11 Effect of time on degree of swelling of pure CM-chitin Film in pH buffer solution pH 7.2

Time (minutes)	Degree of swelling (%)				Standard derivation
	X1	X2	X3	Average	
0.5	161.36	139.16	144.51	148.34	11.59
1.0	184.08	149.14	158.29	163.84	18.12
1.5	205.63	160.46	174.86	180.32	23.07
2.0	256.89	180.81	187.34	208.35	42.17
2.5	243.88	204.99	197.39	215.42	24.94
3.0	260.97	215.36	207.82	228.05	28.76
3.5	282.91	259.69	223.09	255.23	30.16
4.0	310.29	281.38	248.79	280.15	30.77
4.5	345.44	300.38	269.27	305.03	38.30
5.0	361.36	330.9	284.92	325.73	38.48
7.5	377.28	354.32	346.37	359.32	16.05
10	397.28	371.79	357.36	375.48	20.21
15	414.17	394.43	380.07	396.22	17.12
20	426.41	413.24	400.56	413.40	12.93
25	453.01	429.37	435.2	439.19	12.32
30	473.98	451.44	449.91	458.44	13.48
40	484.66	475.24	460.89	473.60	11.97
50	510.1	484.84	482.31	492.42	15.37
60	532.23	499.81	499.81	510.62	18.72
90	548.74	523.03	505.96	525.91	21.53
120	557.67	544.15	514.15	538.66	22.27

Table G12 Effect of time on degree of swelling of CM-chitin/silk fibroin blend films: 80/20 in pH buffer solution pH 7.2

Time (minutes)	Degree of swelling (%)				Standard derivation
	X1	X2	X3	Average	
0.5	105.38	96.22	117.25	106.28	10.54
1.0	133.33	99.20	128.29	120.27	18.42
1.5	141.51	115.31	145.54	134.12	16.41
2.0	157.63	123.46	162.79	147.96	21.37
2.5	160.00	155.27	175.58	163.62	10.63
3.0	166.24	169.58	202.91	179.58	20.28
3.5	178.92	188.67	233.72	200.44	29.23
4.0	185.16	210.74	248.64	214.85	31.94
4.5	213.12	232.41	256.40	233.98	21.68
5.0	238.28	244.33	294.77	259.13	31.02
7.5	251.40	270.38	335.08	285.62	43.87
10	273.33	292.25	364.73	310.10	48.24
15	297.63	324.06	369.96	330.55	36.60
20	320.22	343.74	396.90	353.62	39.28
25	359.35	367.99	415.70	381.01	30.35
30	391.18	391.65	437.40	406.74	26.55
40	404.30	405.57	443.22	417.70	22.11
50	423.01	432.41	459.50	438.31	18.95
60	434.84	456.26	466.09	452.40	15.98
90	451.61	461.23	478.88	463.91	13.83
120	470.75	476.34	483.53	476.87	6.41

Table G13 Effect of time on degree of swelling of CM-chitin/silk fibroin blend films: 60/40 in pH buffer solution pH 7.2

Time (minutes)	Degree of swelling (%)				Standard derivation
	X1	X2	X3	Average	
0.5	74.80	71.73	80.97	75.83	4.71
1.0	91.20	79.92	90.87	87.33	6.42
1.5	104.60	89.86	100.58	98.35	7.62
2.0	131.40	97.27	120.97	116.55	17.49
2.5	146.20	109.75	130.49	128.81	18.28
3.0	155.60	118.91	139.42	137.98	18.39
3.5	160.40	144.05	147.96	150.80	8.54
4.0	177.80	158.48	152.82	163.03	13.10
4.5	165.00	170.57	157.28	164.28	6.67
5.0	185.20	177.39	176.89	179.83	4.66
7.5	217.20	199.42	206.02	207.55	8.99
10	234.40	218.13	218.83	223.79	9.20
15	249.20	240.35	238.83	242.79	5.60
20	270.60	261.50	255.73	262.61	7.50
25	284.60	276.61	279.81	280.34	4.02
30	329.40	306.63	314.76	316.93	11.54
40	353.80	330.02	333.20	339.01	12.91
50	369.60	359.26	359.22	362.69	5.98
60	397.20	371.35	369.71	379.42	15.42
90	414.60	399.61	398.64	404.28	8.95
120	428.20	408.97	413.20	416.79	10.11

Table G14 Effect of time on degree of swelling of CM-chitin/silk fibroin blend films: 50/50 in pH buffer solution pH 7.2

Time (minutes)	Degree of swelling (%)				Standard derivation
	X1	X2	X3	Average	
0.5	66.54	86.78	63.25	72.19	12.74
1.0	77.43	96.36	70.02	81.27	13.58
1.5	92.22	108.05	84.53	94.93	11.99
2.0	109.14	118.97	100.19	109.43	9.39
2.5	118.48	127.39	110.06	118.64	8.67
3.0	130.54	130.46	120.89	127.30	5.55
3.5	139.69	146.36	134.62	140.22	5.89
4.0	148.05	153.64	146.62	149.44	3.71
4.5	157.39	165.52	156.09	159.67	5.11
5.0	172.57	172.61	175.82	173.67	1.86
7.5	183.27	198.47	203.29	195.01	10.45
10	205.84	212.64	219.92	212.80	7.04
15	221.40	235.63	243.13	233.39	11.04
20	239.49	259.39	258.99	252.62	11.38
25	260.51	273.95	275.63	270.03	8.29
30	279.38	291.76	312.38	294.51	16.67
40	297.86	309.20	342.17	316.41	23.02
50	316.15	329.69	366.73	337.52	26.18
60	335.80	350.96	388.01	358.26	26.86
90	356.61	368.58	409.28	378.16	27.61
120	372.96	387.93	419.54	393.48	23.78

Table G15 Effect of time on degree of swelling of CM-chitin/silk fibroin blend films: 40/60 in pH buffer solution pH 7.2

Time (minutes)	Degree of swelling (%)				Standard derivation
	X1	X2	X3	Average	
0.5	28.57	45.29	39.17	37.68	8.46
1.0	38.69	54.12	49.21	47.34	7.88
1.5	47.22	59.22	56.30	54.25	6.26
2.0	56.55	73.92	62.01	64.16	8.88
2.5	67.06	81.18	66.54	71.59	8.31
3.0	88.89	93.53	75.98	86.13	9.09
3.5	100.79	100.20	77.95	92.98	13.02
4.0	128.77	112.55	94.09	111.80	17.35
4.5	151.59	130.20	99.21	127.00	26.34
5.0	166.27	143.73	131.30	147.10	17.73
7.5	182.34	165.10	148.82	165.42	16.76
10	202.78	179.02	165.35	182.38	18.94
15	234.13	198.82	192.72	208.56	22.36
20	248.41	218.24	200.39	222.35	24.27
25	261.90	241.57	229.53	244.33	16.36
30	283.93	257.84	250.00	263.92	17.76
40	301.19	280.78	258.86	280.28	21.17
50	323.02	292.94	282.87	299.61	20.89
60	343.65	309.61	296.46	316.57	24.35
90	353.57	320.20	324.80	332.86	18.09
120	367.06	346.08	341.14	351.43	13.76

APPENDIX H

Data of Drug Release from CM-chitin/PVA Blend Films

Table H1 Release of salicylic acid from the blend films with 80% CM-chitin content at pH 2.0

Time (minutes)	Amount of drug release (%)				Standard derivation
	X1	X2	X3	Average	
0.5	64.99	62.93	64.52	64.15	1.0796
1.0	69.61	69.86	65.49	68.32	2.4540
1.5	71.97	72.05	69.84	71.29	1.2535
2.0	72.38	72.59	72.38	72.45	0.1212
2.5	72.8	72.53	72.67	72.67	0.1350
3.0	72.9	72.99	73.07	72.99	0.0850
3.5	73.34	73.36	73.32	73.34	0.0200
4.0	73.76	73.9	76.13	74.60	1.3297
4.5	74.15	74.46	74.55	74.39	0.2098
5.0	74.65	74.57	75.4	74.87	0.4579
7.5	74.88	75.01	75.67	75.19	0.4236
10	75.4	75.48	75.8	75.56	0.2117
15	76.73	76.09	76.52	76.45	0.3262
20	77.25	76.77	76.61	76.88	0.3331
25	78.17	77.48	77.04	77.56	0.5696
30	78.31	77.88	77.92	78.04	0.2376
40	79.52	78.4	78.19	78.70	0.7150
50	80.25	79.04	80.21	79.83	0.6873
60	83.77	83.5	82.12	83.13	0.8850
120	84.33	84.16	84.31	84.27	0.0929

Table H2 Release of salicylic acid from the blend films with 60% CM-chitin content at pH 2.0

Time (minutes)	Amount of drug release (%)				Standard derivation
	X1	X2	X3	Average	
0.5	74.15	71.97	73.28	73.13	1.0974
1.0	74.38	72.34	73.76	73.49	1.0458
1.5	74.65	73.76	74.42	74.28	0.4620
2.0	74.96	74.11	74.59	74.55	0.4262
2.5	75.44	74.44	75.15	75.01	0.5145
3.0	75.57	74.63	75.86	75.35	0.6430
3.5	75.88	74.76	76.11	75.58	0.7222
4.0	76.55	75.36	76.55	76.15	0.6870
4.5	78.13	76.48	76.65	77.09	0.9075
5.0	78.79	77.48	77.11	77.79	0.8827
7.5	78.9	78.36	77.46	78.24	0.7275
10	79.11	78.73	77.9	78.58	0.6188
15	79.63	79.33	78.4	79.12	0.6413
20	80.02	80.02	79.35	79.80	0.3868
25	80.67	80.67	80.02	80.45	0.3753
30	80.94	80.77	80.67	80.79	0.1365
40	81.21	81.66	81.02	81.30	0.3287
50	81.62	82.1	81.21	81.64	0.4455
60	81.89	82.33	82.06	82.09	0.2219
120	82	82.48	82.56	82.35	0.3029

Table H3 Release of salicylic acid from the blend films with 50% CM-chitin content at pH 2.0

Time (minutes)	Amount of drug release (%)				Standard derivation
	X1	X2	X3	Average	
0.5	52.92	54.34	53.03	53.43	0.7900
1.0	55.59	55.67	53.57	54.94	1.1900
1.5	57.09	56.46	54.76	56.10	1.2053
2.0	59.44	59.85	57.42	58.90	1.3009
2.5	61	60.23	59.81	60.35	0.6035
3.0	62.68	62.87	61.54	62.36	0.7193
3.5	63.37	63.66	63.37	63.47	0.1674
4.0	64.06	63.98	63.62	63.89	0.2344
4.5	64.95	64.77	63.73	64.48	0.6586
5.0	65.72	65.64	65.49	65.62	0.1168
7.5	67.26	66.33	65.68	66.42	0.7941
10	68.39	67.35	67.53	67.76	0.5558
15	69.12	68.37	68.7	68.73	0.3759
20	70.47	69.18	69.64	69.76	0.6538
25	71.01	70.47	70.47	70.65	0.3118
30	71.93	71.01	71.47	71.47	0.4600
40	72.55	72.55	72.53	72.54	0.0115
50	73.09	73.74	72.67	73.17	0.5391
60	74.4	75.36	75.8	75.19	0.7159
120	75.8	76.67	76.05	76.17	0.4479

Table H4 Release of salicylic acid from the blend films with 40% CM-chitin content at pH 2.0

Time (minutes)	Amount of drug release (%)				Standard derivation
	X1	X2	X3	Average	
0.5	57.5	55.23	56.42	56.38	1.1354
1.0	58.71	58.98	59.81	59.17	0.5733
1.5	59.44	59.92	61.56	60.31	1.1116
2.0	61	60.4	61.89	61.10	0.7497
2.5	62.48	61.89	62.68	62.35	0.4107
3.0	63.37	62.93	62.93	63.08	0.2540
3.5	64.22	63.62	63.39	63.74	0.4285
4.0	64.77	64	63.98	64.25	0.4504
4.5	66.08	64.77	64.83	65.23	0.7396
5.0	67.03	65.85	65.85	66.24	0.6813
7.5	67.53	67.58	67.76	67.62	0.1210
10	69.22	69.8	68.41	69.14	0.6982
15	69.61	70.26	69.18	69.68	0.5437
20	70.26	70.99	70.47	70.57	0.3758
25	70.63	71.93	71.28	71.28	0.6500
30	70.8	72.03	72.55	71.79	0.8987
40	71.3	72.36	72.88	72.18	0.8052
50	71.88	72.45	73.07	72.47	0.5952
60	72.03	72.67	73.28	72.66	0.6251
120	72.55	72.88	73.53	72.99	0.4986

Table H5 Release of salicylic acid from the blend films with 80% CM-chitin content at pH 5.5

Time (minutes)	Amount of drug release (%)				Standard derivation
	X1	X2	X3	Average	
0.5	65.04	66.87	66.06	65.99	0.9170
1.0	68.16	68.76	68.43	68.45	0.3005
1.5	68.53	69.61	68.72	68.95	0.5766
2.0	69.84	70.24	70.22	70.10	0.2254
2.5	70.3	71.07	71.2	70.86	0.4864
3.0	71.01	72.11	72.38	71.83	0.7257
3.5	71.7	72.47	72.74	72.30	0.5397
4.0	72.45	72.65	72.9	72.67	0.2255
4.5	72.74	73.01	73.34	73.03	0.3005
5.0	72.17	73.32	74.24	73.24	1.0371
7.5	72.53	73.8	74.57	73.63	1.0302
10	72.88	73.92	75.19	74.00	1.1569
15	73.09	74.34	75.42	74.28	1.1660
20	73.8	74.8	75.86	74.82	1.0301
25	74.46	74.94	76.63	75.34	1.1398
30	74.59	75.25	76.67	75.50	1.0629
40	74.94	75.4	76.86	75.73	1.0025
50	75.19	75.86	77.04	76.03	0.9366
60	76.5	75.9	77.5	76.63	0.8083
120	76.69	76	77.69	76.79	0.8497

Table H6 Release of salicylic acid from the blend films with 60% CM-chitin content at pH 5.5

Time (minutes)	Amount of drug release (%)				Standard derivation
	X1	X2	X3	Average	
0.5	51.74	52.26	53.57	52.52	0.9430
1.0	52.09	52.92	54.55	53.19	1.2515
1.5	52.92	53.34	55.21	53.82	1.2191
2.0	55.28	54.84	55.65	55.26	0.4055
2.5	57.4	58.13	56.75	57.43	0.6904
3.0	57.98	58.42	58.15	58.18	0.2219
3.5	58.81	58.61	58.34	58.59	0.2359
4.0	59.27	59.02	59.21	59.17	0.1305
4.5	59.77	59.6	59.63	59.67	0.0907
5.0	61.87	59.9	60.23	60.67	1.0551
7.5	62.87	60.96	60.58	61.47	1.2272
10	64	61.91	61.66	62.52	1.2849
15	64.22	62.91	62.1	63.08	1.0698
20	64.62	63.98	62.68	63.76	0.9885
25	65.68	65.16	63.54	64.79	1.1161
30	66.14	66.06	64.18	65.46	1.1092
40	67.08	66.22	65.06	66.12	1.0137
50	67.76	67.8	67.33	67.63	0.2606
60	68.22	69.74	68.22	68.73	0.8776
120	69.12	70.22	69.41	69.58	0.5701

Table H7 Release of salicylic acid from the blend films with 50% CM-chitin content at pH 5.5

Time (minutes)	Amount of drug release (%)				Standard derivation
	X1	X2	X3	Average	
0.5	53.24	53.65	54.34	53.74	0.5559
1.0	55.01	54.65	55.65	55.10	0.5065
1.5	55.07	55.73	55.88	55.56	0.4309
2.0	55.69	56.21	56.3	56.07	0.3293
2.5	56.63	57.09	56.55	56.76	0.2914
3.0	57.29	57.4	57.29	57.33	0.0635
3.5	57.79	58.17	58.15	58.04	0.2139
4.0	59.48	59.19	58.48	59.05	0.5145
4.5	59.9	60.27	59.15	59.77	0.5706
5.0	61.66	60.4	59.85	60.64	0.9279
7.5	62.14	61.02	60.4	61.19	0.8819
10	62.37	62.66	61.48	62.17	0.6149
15	62.46	63.37	62.48	62.77	0.5197
20	62.48	63.79	63.77	63.35	0.7506
25	62.68	63.95	64.22	63.62	0.8223
30	63.37	64.2	64.37	63.98	0.5351
40	63.6	64.27	65.45	64.44	0.9366
50	64.02	64.58	66.08	64.89	1.0651
60	65.02	64.64	66.31	65.32	0.8753
120	65.68	65.45	66.43	65.85	0.5125

Table H8 Release of salicylic acid from the blend films with 40% CM-chitin content at pH 5.5

Time (minutes)	Amount of drug release (%)				Standard derivation
	X1	X2	X3	Average	
0.5	46.91	45.24	46.01	46.05	0.8358
1.0	51.43	51.05	52.92	51.80	0.9884
1.5	53.17	52.55	53.61	53.11	0.5325
2.0	53.76	54.36	53.84	53.99	0.3258
2.5	55.23	55.67	54.24	55.05	0.7324
3.0	57.5	58	57.94	57.81	0.2730
3.5	59.77	59.6	58.34	59.24	0.7812
4.0	60.06	60.02	58.98	59.69	0.6123
4.5	60.25	60.46	59.85	60.19	0.3099
5.0	60.58	60.87	60.21	60.55	0.3308
7.5	61.06	61.75	60.44	61.08	0.6553
10	61.5	62.93	61.48	61.97	0.8314
15	61.94	63.37	61.66	62.32	0.9172
20	62.16	63.79	62.1	62.68	0.9589
25	62.31	63.93	62.93	63.06	0.8174
30	62.5	63.98	63.79	63.42	0.8053
40	62.73	64.16	63.95	63.61	0.7722
50	63.64	64.35	64.87	64.29	0.6174
60	63.73	65.04	65.87	64.88	1.0789
120	63.91	65.22	65.83	64.99	0.9810

Table H9 Release of salicylic acid from the blend films with 80% CM-chitin content at pH 7.2

Time (minutes)	Amount of drug release (%)				Standard derivation
	X1	X2	X3	Average	
0.5	67.64	66.95	68.7	67.76	0.8815
1.0	70.59	70.24	70.22	70.35	0.2081
1.5	75.8	74.34	74.61	74.92	0.7768
2.0	81.08	78.13	76.61	78.61	2.2728
2.5	81.21	78.94	77.11	79.09	2.0539
3.0	81.39	80.08	78.81	80.09	1.2901
3.5	82.52	82.29	79.56	81.46	1.6466
4.0	82.77	82.93	80.65	82.12	1.2727
4.5	83.02	83.5	81.06	82.53	1.2926
5.0	83.12	83.95	82.91	83.33	0.5499
7.5	83.39	83.98	84.02	83.80	0.3528
10	83.5	84.2	84.77	84.16	0.6361
15	83.73	84.6	84.87	84.40	0.5957
20	84.22	84.83	85.02	84.69	0.4180
25	84.66	84.97	86.18	85.27	0.8032
30	85.08	85.58	86.87	85.84	0.9236
40	85.58	85.72	88.28	86.53	1.5200
50	86.08	87.89	88.62	87.53	1.3077
60	86.26	88.18	88.84	87.76	1.3403
120	87.33	88.05	88.95	88.11	0.8117

Table H10 Release of salicylic acid from the blend films with 60% CM-chitin content at pH 7.2

Time (minutes)	Amount of drug release (%)				Standard derivation
	X1	X2	X3	Average	
0.5	71.84	69.78	71.51	71.04	1.1065
1.0	72.38	71.28	72.38	72.01	0.6351
1.5	72.67	72.38	72.99	72.68	0.3051
2.0	72.86	73.32	74.59	73.59	0.8960
2.5	72.99	73.76	75.15	73.97	1.0947
3.0	73.09	74.65	75.63	74.46	1.2810
3.5	73.34	74.98	76.09	74.80	1.3835
4.0	73.38	75.42	76.67	75.16	1.6607
4.5	73.71	75.69	76.77	75.39	1.5519
5.0	74.46	75.8	76.88	75.71	1.2123
7.5	74.69	76.46	77.02	76.06	1.2162
10	75.8	76.63	77.5	76.64	0.8501
15	76.05	76.73	77.73	76.84	0.8451
20	76.25	76.88	77.88	77.00	0.8220
25	76.48	77.07	78.21	77.25	0.8795
30	76.77	77.36	78.23	77.45	0.7345
40	77.25	77.48	78	77.58	0.3842
50	78.71	77.73	78.96	78.47	0.6501
60	82.25	82.38	83.13	82.59	0.4750
120	82.37	83.02	83.39	82.93	0.5164

Table H11 Release of salicylic acid from the blend films with 50% CM-chitin content at pH 7.2

Time (minutes)	Amount of drug release (%)				Standard derivation
	X1	X2	X3	Average	
0.5	58.15	58.86	57.69	58.23	0.5894
1.0	69.09	69.64	68.32	69.02	0.6630
1.5	69.55	70.47	69.12	69.71	0.6897
2.0	69.89	70.66	69.64	70.06	0.5316
2.5	69.64	70.8	72.05	70.83	1.2053
3.0	71.84	71.03	72.17	71.68	0.5866
3.5	74.07	71.47	72.76	72.77	1.3000
4.0	74.24	72.15	72.88	73.09	1.0607
4.5	74.46	73.57	73.28	73.77	0.6149
5.0	74.94	74.07	73.34	74.12	0.8010
7.5	76.46	75.36	74.34	75.39	1.0603
10	77.04	75.9	74.59	75.84	1.2260
15	77.77	76.05	74.78	76.20	1.5006
20	78.17	76.69	74.96	76.61	1.6066
25	78.86	78.79	75.46	77.70	1.9431
30	79.31	79.04	75.82	78.06	1.9417
40	79.96	79.46	78.13	79.18	0.9459
50	80.6	80.04	78.75	79.80	0.9487
60	80.92	80.65	80.37	80.65	0.2750
120	81.23	80.83	80.6	80.89	0.3188

Table H12 Release of salicylic acid from the blend films with 40% CM-chitin content at pH 7.2

Time (minutes)	Amount of drug release (%)				Standard derivation
	X1	X2	X3	Average	
0.5	49.7	50.45	48.39	49.51	1.0426
1.0	50.91	51.11	49.03	50.35	1.1475
1.5	52.74	51.3	50.45	51.50	1.1576
2.0	53.76	52.3	51.76	52.61	1.0347
2.5	55.88	53.65	52.67	54.07	1.6451
3.0	56.11	54.92	53.82	54.95	1.1453
3.5	56.67	55.63	54.46	55.59	1.1056
4.0	57.4	56.55	55.65	56.53	0.8751
4.5	57.79	56.94	57.4	57.38	0.4255
5.0	59.81	57.94	59.85	59.20	1.0914
7.5	61.5	59.02	60.73	60.42	1.2693
10	63.64	61.66	61.54	62.28	1.1793
15	66.1	63.08	62.77	63.98	1.8396
20	66.85	63.31	63.37	64.51	2.0267
25	68.39	64.39	64.25	65.68	2.3509
30	69.18	65.06	65.68	66.64	2.2214
40	70.26	67.53	68.37	68.72	1.3982
50	71.2	69.18	73.8	71.39	2.3161
60	73.92	70.3	74.4	72.87	2.2415
120	75.4	72.49	74.13	74.01	1.4589

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