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APPENDICES

Appendix I

Calibration curve

Table 25 Absorbance of potassium dihydrogen phosphate determined at 500 nm

Concentration (mg/100ml)	Absorbance
0	0.000
2	0.134
4	0.267
6	0.394
8	0.420
10	0.424

Figure 25 Calibration curve of potassium dihydrogen phosphate

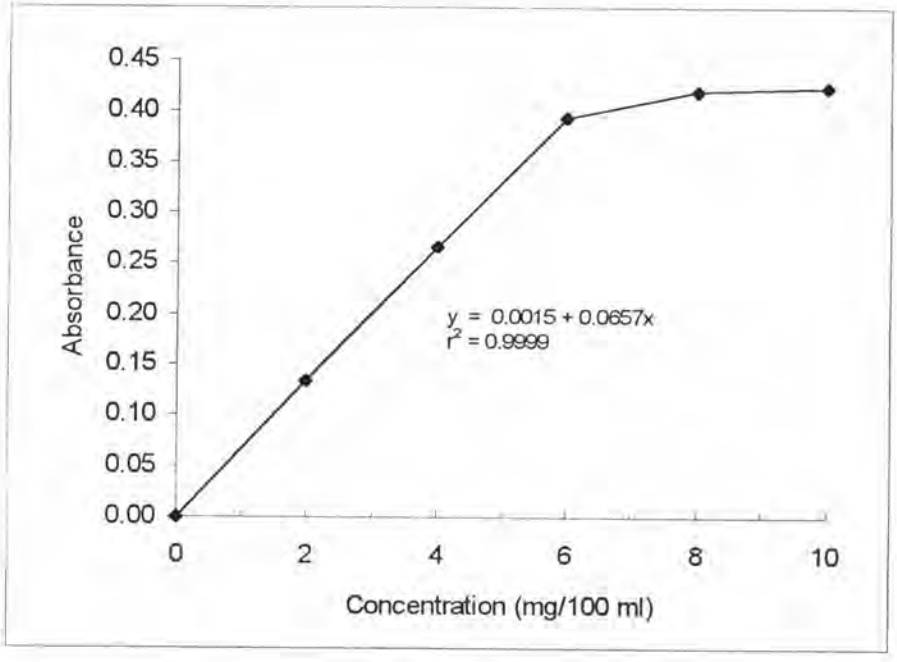
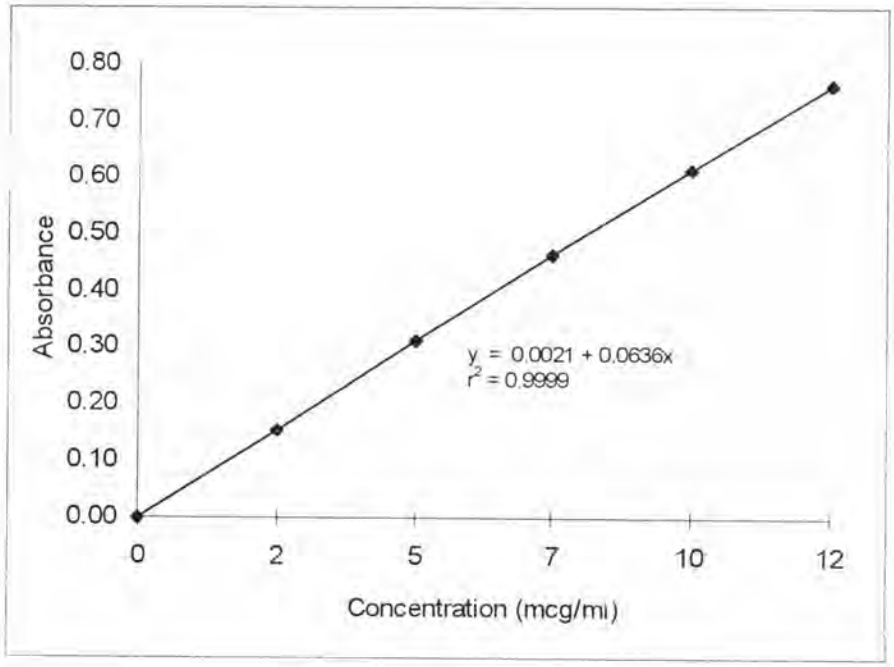


Table 26 Absorbance of paracetamol determined at 243.4 nm

Concentration (mcg/100ml)	Absorbance
0	0.000
2.399	0.155
4.858	0.311
7.216	0.461
9.637	0.615
11.980	0.764

Figure 26 Calibration curve of paracetamol



Appendix II

The curves of particle size distribution and the cumulative percent undersize

Table 27 The cumulative percent undersize of $NaCMC_1$

Result Statistics

Distribution Type: Volume
Mean Diameters
D [4, 3] = 136.34 um

Concentration = 0.0324 %Vol
D (v, 0.1) = 28.38 um
D [3, 2] = 46.16 um

Density = 1.000 g / cub. cm
D (v, 0.5) = 124.03 um
Span = 1.891E+00

Specific S.A. = 0.1246 sq. m / g
D (v, 0.9) = 262.94 um
Uniformity = 5.630E-01

Size_Low (um)	In %	Size_High (um)	Under%
0.49	0.03	0.58	0.03
0.58	0.06	0.67	0.09
0.67	0.08	0.78	0.17
0.78	0.07	0.91	0.24
0.91	0.06	1.06	0.29
1.06	0.05	1.24	0.34
1.24	0.03	1.44	0.37
1.44	0.02	1.68	0.40
1.68	0.02	1.95	0.41
1.95	0.02	2.28	0.43
2.28	0.03	2.65	0.46
2.65	0.04	3.09	0.50
3.09	0.06	3.60	0.56
3.60	0.08	4.19	0.65
4.19	0.11	4.88	0.76
4.88	0.14	5.69	0.90
5.69	0.18	6.63	1.08
6.63	0.24	7.72	1.32
7.72	0.32	9.00	1.64
9.00	0.43	10.48	2.07
10.48	0.58	12.21	2.65
12.21	0.77	14.22	3.42
14.22	0.99	16.57	4.41
16.57	1.25	19.31	5.66
19.31	1.52	22.49	7.18
22.49	1.78	26.20	8.96
26.20	2.04	30.53	11.00
30.53	2.28	35.56	13.28
35.56	2.53	41.43	15.82
41.43	2.83	48.27	18.65
48.27	3.22	56.23	21.87
56.23	3.75	65.51	25.62
65.51	4.43	76.32	30.04
76.32	5.25	88.91	35.30
88.91	6.18	103.58	41.48
103.58	7.14	120.67	48.62
120.67	8.06	140.58	56.68
140.58	8.94	163.77	65.63
163.77	8.68	190.80	74.50
190.80	8.12	222.28	82.62
222.28	6.79	258.95	89.41
258.95	5.13	301.68	94.55
301.68	3.48	351.46	98.02
351.46	1.82	409.45	99.84
409.45	0.16	477.01	100.00
477.01	0.00	555.71	100.00
555.71	0.00	647.41	100.00
647.41	0.00	754.23	100.00
754.23	0.00	878.67	100.00

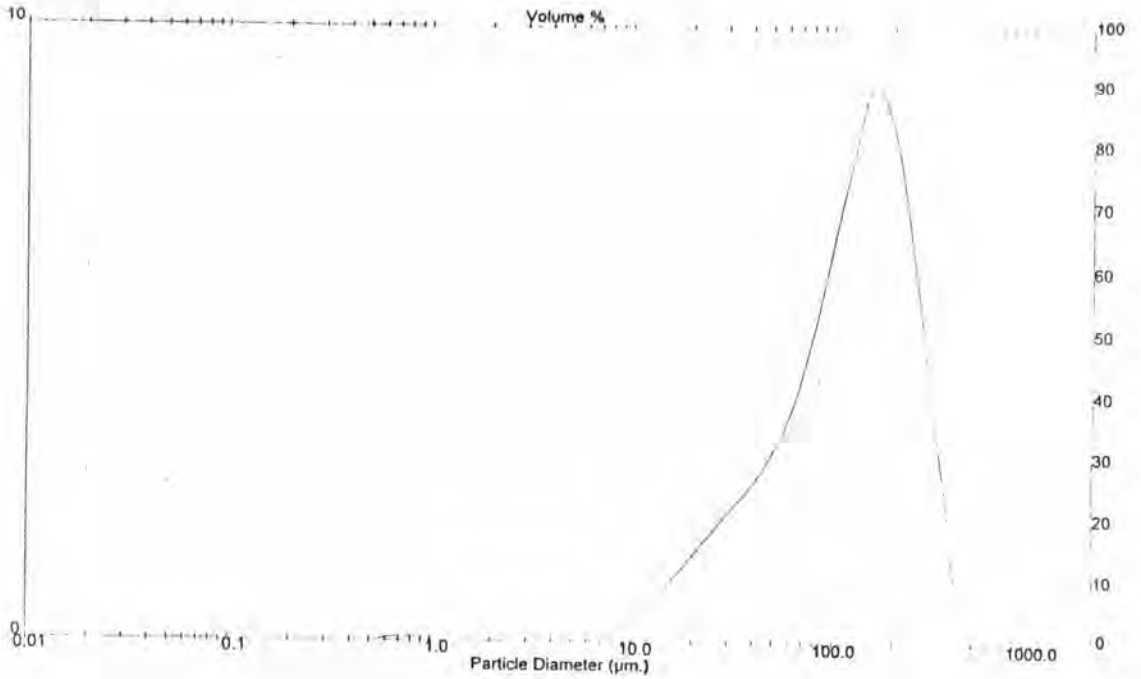


Figure 27 The curve of particle size distribution of $NaCMC_1$

Table 28 The cumulative percent undersize of M_1

Result Statistics

Distribution Type: Volume
Mean Diameters:
D [4, 3] = 163.06 um

Concentration = 0.1184 %Vol
D (v, 0.1) = 64.23 um
D [3, 2] = 109.69 um

Density = 1.000 g / cub. cm
D (v, 0.5) = 156.54 um
Span = 1.329E+00

Specific S.A. = 0.0547 sq. m / g
D (v, 0.9) = 272.27 um
Uniformity = 4.085E-01

Size_Low (um)	In %	Size_High (um)	Under%
0.49	0.00	0.58	0.00
0.58	0.00	0.67	0.00
0.67	0.00	0.78	0.00
0.78	0.00	0.91	0.00
0.91	0.00	1.06	0.00
1.06	0.00	1.24	0.00
1.24	0.00	1.44	0.00
1.44	0.00	1.68	0.00
1.68	0.00	1.95	0.00
1.95	0.00	2.28	0.00
2.28	0.00	2.65	0.00
2.65	0.00	3.09	0.00
3.09	0.00	3.60	0.00
3.60	0.00	4.19	0.00
4.19	0.00	4.88	0.00
4.88	0.00	5.69	0.00
5.69	0.00	6.63	0.00
6.63	0.00	7.72	0.00
7.72	0.05	9.00	0.05
9.00	0.08	10.48	0.12
10.48	0.13	12.21	0.25
12.21	0.20	14.22	0.45
14.22	0.29	16.57	0.74
16.57	0.40	19.31	1.14
19.31	0.52	22.49	1.66
22.49	0.64	26.20	2.30
26.20	0.75	30.53	3.05
30.53	0.87	35.56	3.91
35.56	1.03	41.43	4.94
41.43	1.29	48.27	6.23
48.27	1.72	56.23	7.96
56.23	2.40	65.51	10.36
65.51	3.36	76.32	13.72
76.32	4.84	88.91	18.56
88.91	6.21	103.58	24.58
103.58	7.96	120.67	32.54
120.67	9.70	140.58	42.24
140.58	11.27	163.77	53.51
163.77	12.56	190.80	66.07
190.80	11.70	222.28	77.77
222.28	9.65	258.95	87.42
258.95	6.92	301.68	94.34
301.68	4.19	351.46	98.53
351.46	1.47	409.45	100.00
409.45	0.00	477.01	100.00
477.01	0.00	555.71	100.00
555.71	0.00	647.41	100.00
647.41	0.00	754.23	100.00
754.23	0.00	878.67	100.00

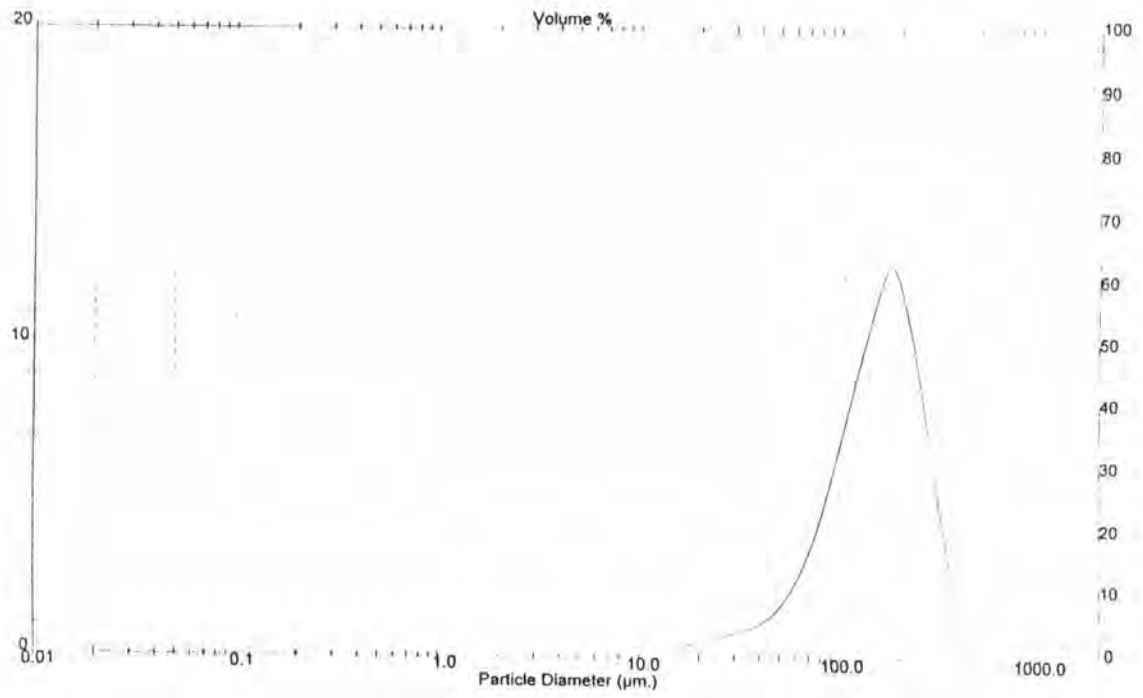


Figure 28 The curve of particle size distribution of M_1

Table 29 The cumulative percent undersize of $NaCMC_2$

Result Statistics

Distribution Type: Volume
Mean Diameters:
D [4, 3] = 120.93 um

Concentration = 0.0050 %Vol
D (v, 0.1) = 26.83 um
D [3, 2] = 43.16 um

Density = 1.000 g / cub. cm
D (v, 0.5) = 103.45 um
Span = 2.093E+00

Specific S.A. = 0.1390 sq. m / g
D (v, 0.9) = 243.35 um
Uniformity = 8.554E-01

Size_Low (um)	In %	Size_High (um)	Under%
0.49	0.04	0.58	0.04
0.58	0.07	0.67	0.11
0.67	0.09	0.78	0.20
0.78	0.08	0.91	0.28
0.91	0.07	1.06	0.35
1.06	0.05	1.24	0.40
1.24	0.04	1.44	0.44
1.44	0.03	1.68	0.47
1.68	0.02	1.95	0.49
1.95	0.03	2.28	0.52
2.28	0.04	2.65	0.56
2.65	0.06	3.09	0.62
3.09	0.08	3.60	0.70
3.60	0.10	4.19	0.80
4.19	0.12	4.88	0.92
4.88	0.13	5.69	1.05
5.69	0.15	6.63	1.20
6.63	0.18	7.72	1.38
7.72	0.23	9.00	1.61
9.00	0.32	10.48	1.93
10.48	0.47	12.21	2.41
12.21	0.70	14.22	3.10
14.22	1.00	16.57	4.11
16.57	1.38	19.31	5.49
19.31	1.82	22.49	7.31
22.49	2.29	26.20	9.60
26.20	2.76	30.53	12.36
30.53	3.20	35.56	15.56
35.56	3.61	41.43	19.17
41.43	4.00	48.27	23.16
48.27	4.39	56.23	27.56
56.23	4.83	65.51	32.39
65.51	5.33	76.32	37.72
76.32	5.88	88.91	43.60
88.91	6.45	103.58	50.05
103.58	6.98	120.67	57.04
120.67	7.44	140.58	64.48
140.58	7.85	163.77	72.32
163.77	7.53	190.80	79.85
190.80	6.72	222.28	86.57
222.28	5.52	258.95	92.09
258.95	4.08	301.68	96.17
301.68	2.64	351.46	98.81
351.46	1.19	409.45	100.00
409.45	0.00	477.01	100.00
477.01	0.00	555.71	100.00
555.71	0.00	647.41	100.00
647.41	0.00	754.23	100.00
754.23	0.00	878.67	100.00

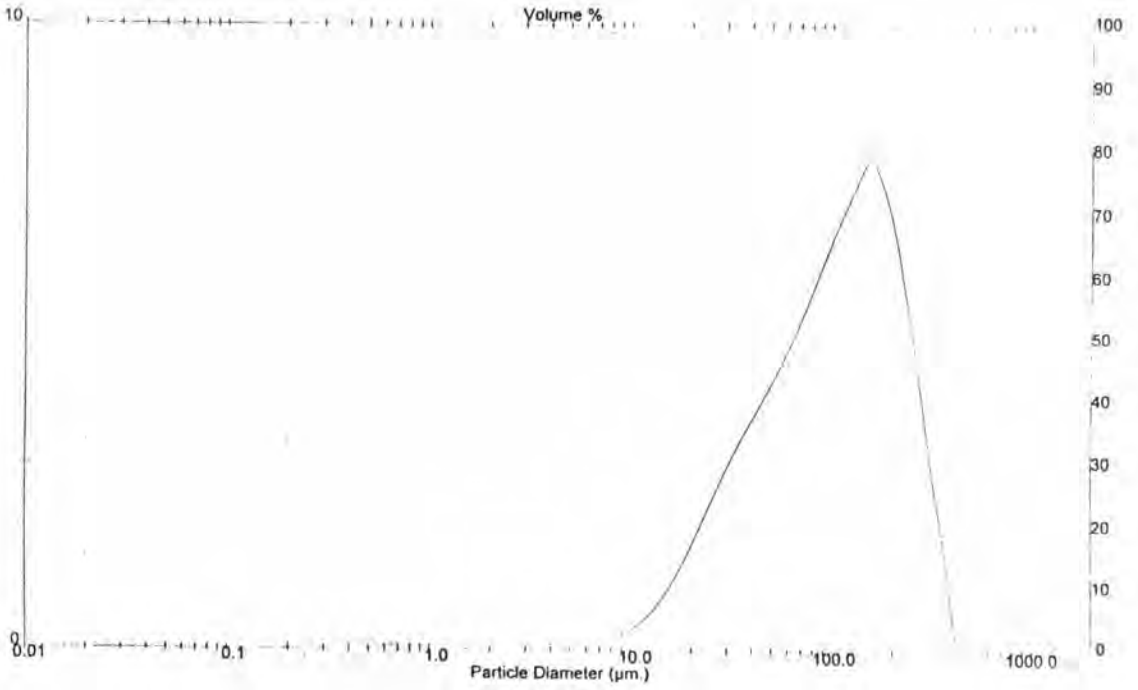


Figure 29 The curve of particle size distribution of $NaCMC_2$

Table 30 The cumulative percent undersize of M_2

Result Statistics

Distribution Type: Volume
Mean Diameters:
D [4, 3] = 140.09 um

Concentration = 0.0029 %Vol
D (v, 0.1) = 36.31 um
D [3, 2] = 74.23 um

Density = 1.000 g / cub. cm
D (v, 0.5) = 124.55 um
Span = 1.867E+00

Specific S.A. = 0.0808 sq. m / g
D (v, 0.9) = 268.81 um
Uniformity = 5.793E-01

Size_Low (um)	In %	Size_High (um)	Under%
0.49	0.00	0.58	0.00
0.58	0.00	0.67	0.00
0.67	0.00	0.78	0.00
0.78	0.00	0.91	0.00
0.91	0.00	1.06	0.00
1.06	0.00	1.24	0.00
1.24	0.00	1.44	0.00
1.44	0.00	1.68	0.00
1.68	0.00	1.95	0.00
1.95	0.00	2.28	0.00
2.28	0.01	2.65	0.01
2.65	0.03	3.09	0.04
3.09	0.04	3.60	0.08
3.60	0.06	4.19	0.14
4.19	0.07	4.88	0.21
4.88	0.08	5.69	0.29
5.69	0.08	6.63	0.37
6.63	0.09	7.72	0.46
7.72	0.10	9.00	0.56
9.00	0.14	10.48	0.70
10.48	0.21	12.21	0.91
12.21	0.34	14.22	1.25
14.22	0.53	16.57	1.78
16.57	0.79	19.31	2.57
19.31	1.13	22.49	3.70
22.49	1.53	26.20	5.24
26.20	1.97	30.53	7.21
30.53	2.42	35.56	9.63
35.56	2.89	41.43	12.53
41.43	3.37	48.27	15.89
48.27	3.85	56.23	19.75
56.23	4.39	65.51	24.13
65.51	5.00	76.32	29.13
76.32	5.68	88.91	34.81
88.91	6.42	103.58	41.23
103.58	7.19	120.67	48.42
120.67	7.89	140.58	56.31
140.58	8.57	163.77	64.89
163.77	8.59	190.80	73.47
190.80	8.06	222.28	81.54
222.28	6.98	258.95	88.52
258.95	5.46	301.68	93.98
301.68	3.74	351.46	97.72
351.46	2.01	409.45	99.72
409.45	0.28	477.01	100.00
477.01	0.00	555.71	100.00
555.71	0.00	647.41	100.00
647.41	0.00	754.23	100.00
754.23	0.00	878.67	100.00

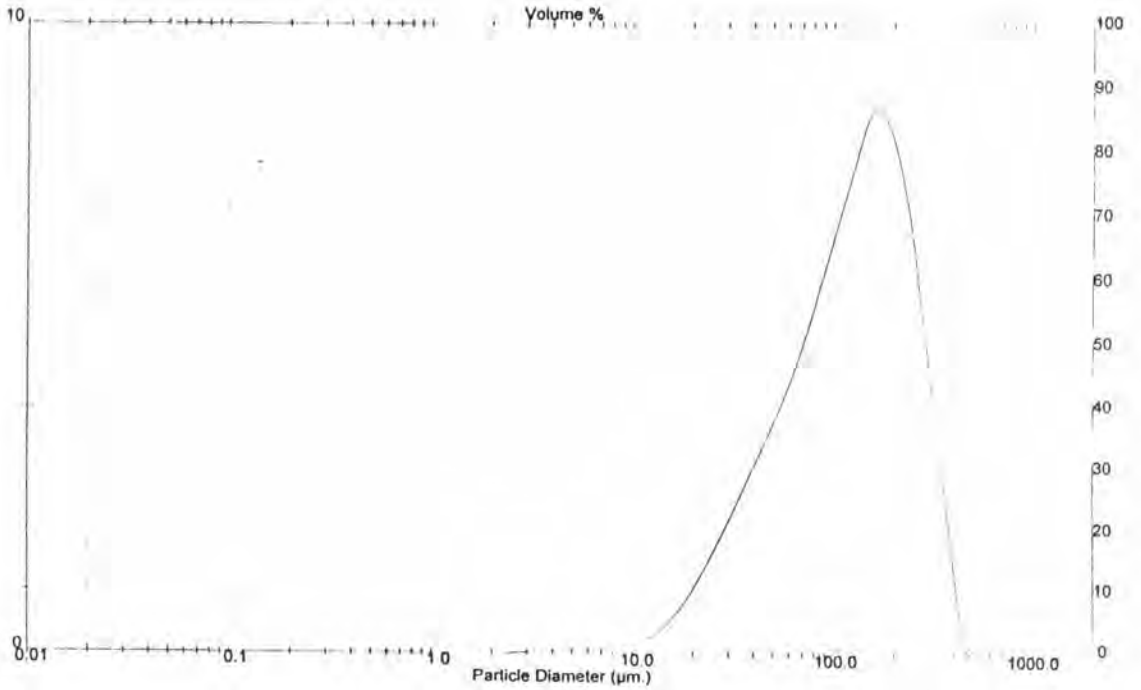


Figure 30 The curve of particle size distribution of M_2

Table 31 The cumulative percent undersize of $NaCMC_3$

Result Statistics

Distribution Type: Volume
Mean Diameters:
D [4, 3] = 124.21 um

Concentration = 0.0230 %Vol
D (v, 0.1) = 29.00 um
D [3, 2] = 46.89 um

Density = 1.000 g / cub. cm
D (v, 0.5) = 103.53 um
Span = 2.155E+00

Specific S.A. = 0.1280 sq. m / g
D (v, 0.9) = 252.08 um
Uniformity = 6.717E-01

Size_Low (um)	In %	Size_High (um)	Under%
0.49	0.04	0.58	0.04
0.58	0.06	0.67	0.10
0.67	0.08	0.78	0.18
0.78	0.07	0.91	0.25
0.91	0.06	1.06	0.31
1.06	0.05	1.24	0.36
1.24	0.03	1.44	0.39
1.44	0.02	1.68	0.41
1.68	0.02	1.95	0.43
1.95	0.02	2.28	0.45
2.28	0.02	2.65	0.47
2.65	0.04	3.09	0.51
3.09	0.05	3.60	0.56
3.60	0.07	4.19	0.62
4.19	0.08	4.88	0.71
4.88	0.09	5.69	0.80
5.69	0.11	6.63	0.91
6.63	0.13	7.72	1.04
7.72	0.18	9.00	1.22
9.00	0.26	10.48	1.48
10.48	0.39	12.21	1.87
12.21	0.59	14.22	2.46
14.22	0.87	16.57	3.33
16.57	1.22	19.31	4.55
19.31	1.64	22.49	6.19
22.49	2.12	26.20	8.31
26.20	2.63	30.53	10.94
30.53	3.14	35.56	14.08
35.56	3.64	41.43	17.73
41.43	4.14	48.27	21.86
48.27	4.63	56.23	26.49
56.23	5.13	65.51	31.61
65.51	5.64	76.32	37.25
76.32	6.15	88.91	43.40
88.91	6.62	103.58	50.02
103.58	7.01	120.67	57.04
120.67	7.31	140.58	64.35
140.58	7.55	163.77	71.90
163.77	7.17	190.80	79.07
190.80	6.42	222.28	85.49
222.28	5.38	258.95	90.86
258.95	4.14	301.68	95.00
301.68	2.90	351.46	97.90
351.46	1.67	409.45	99.57
409.45	0.43	477.01	100.00
477.01	0.00	555.71	100.00
555.71	0.00	647.41	100.00
647.41	0.00	754.23	100.00
754.23	0.00	878.67	100.00

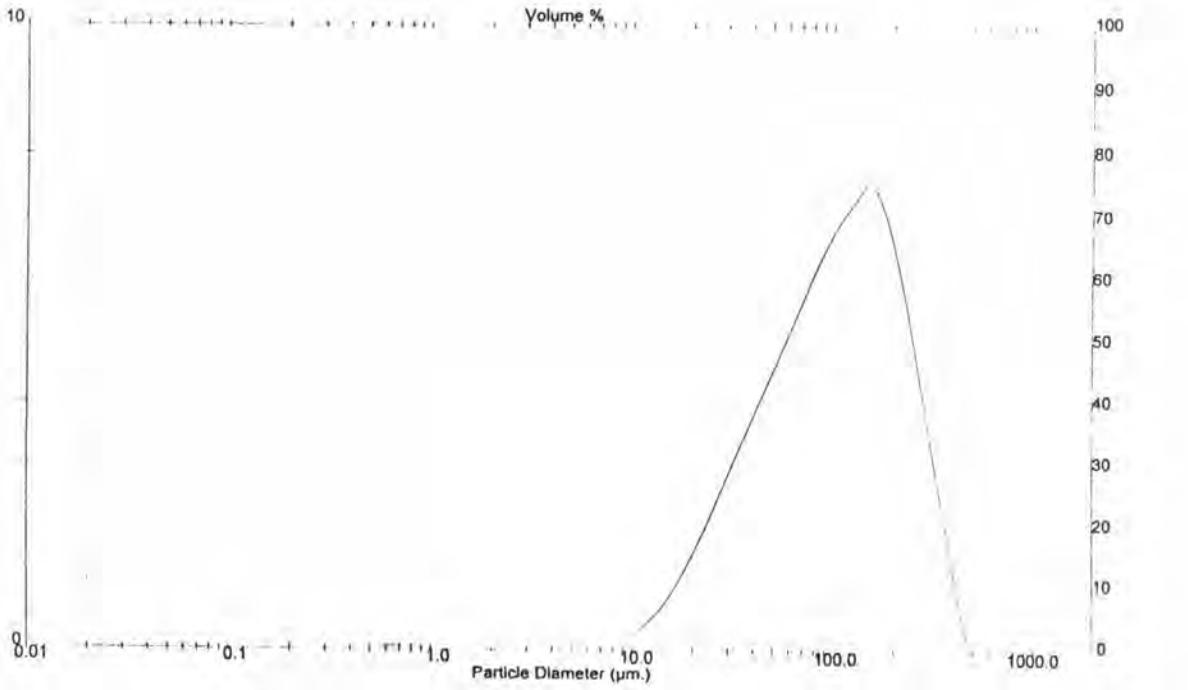


Figure 31 The curve of particle size distribution of $NaCMC_3$

Table 32 The cumulative percent undersize of M_3

Result Statistics

Distribution Type: Volume
Mean Diameters
D [4, 3] = 110.34 um

Concentration = 0.0313 %Vol
D (v, 0.1) = 30.22 um
D [3, 2] = 45.50 um

Density = 1.000 g / cub. cm
D (v, 0.5) = 92.67 um
Span = 2.033E+00

Specific S.A. = 0.1319 sq. m / g
D (v, 0.9) = 218.62 um
Uniformity = 8.300E-01

Size_Low (um)	In %	Size_High (um)	Under%
0.49	0.04	0.58	0.04
0.58	0.07	0.67	0.11
0.67	0.09	0.78	0.20
0.78	0.08	0.91	0.27
0.91	0.07	1.06	0.34
1.06	0.05	1.24	0.39
1.24	0.04	1.44	0.43
1.44	0.03	1.68	0.45
1.68	0.02	1.95	0.47
1.95	0.02	2.28	0.49
2.28	0.03	2.65	0.52
2.65	0.04	3.09	0.56
3.09	0.05	3.60	0.60
3.60	0.06	4.19	0.66
4.19	0.07	4.88	0.73
4.88	0.07	5.69	0.80
5.69	0.07	6.63	0.87
6.63	0.08	7.72	0.95
7.72	0.11	9.00	1.07
9.00	0.17	10.48	1.24
10.48	0.28	12.21	1.52
12.21	0.46	14.22	1.98
14.22	0.72	16.57	2.70
16.57	1.09	19.31	3.79
19.31	1.55	22.49	5.34
22.49	2.11	26.20	7.46
26.20	2.74	30.53	10.20
30.53	3.42	35.56	13.62
35.56	4.12	41.43	17.73
41.43	4.81	48.27	22.54
48.27	5.48	56.23	28.03
56.23	6.12	65.51	34.15
65.51	6.69	76.32	40.83
76.32	7.16	88.91	47.99
88.91	7.50	103.58	55.49
103.58	7.72	120.67	63.22
120.67	7.84	140.58	71.06
140.58	7.38	163.77	78.44
163.77	6.59	190.80	85.02
190.80	5.52	222.28	90.55
222.28	4.29	258.95	94.83
258.95	3.00	301.68	97.84
301.68	1.72	351.46	99.56
351.46	0.44	409.45	100.00
409.45	0.00	477.01	100.00
477.01	0.00	555.71	100.00
555.71	0.00	647.41	100.00
647.41	0.00	754.23	100.00
754.23	0.00	878.67	100.00

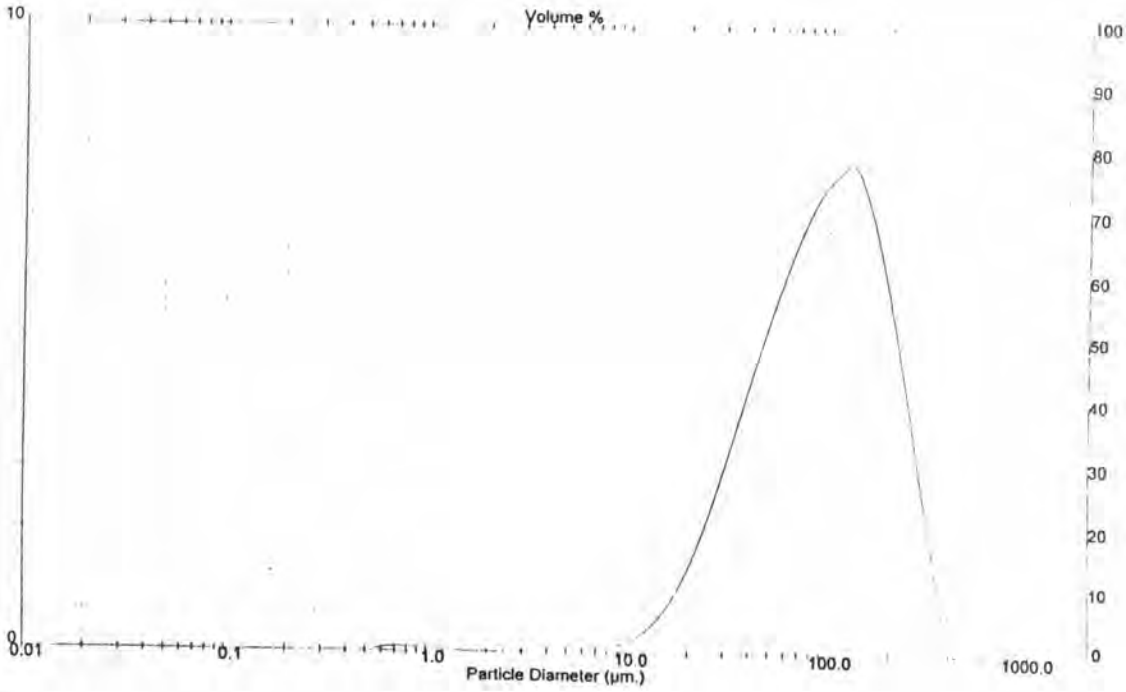


Figure 32 The curve of particle size distribution of M_3

Table 33 The cumulative percent undersize of $NaCMC_4$

Result Statistics

Distribution Type: Volume
Mean Diameters:
D [4, 3] = 91.37 um

Concentration = 0.0425 %Vol
D (v, 0.1) = 25.61 um
D [3, 2] = 38.33 um

Density = 1.000 g / cub. cm
D (v, 0.5) = 76.91 um
Span = 2.014E+00

Specific S.A. = 0.1565 sq. m / g
D (v, 0.9) = 180.48 um
Uniformity = 6.264E-01

Size_Low (um)	In %	Size_High (um)	Under%
0.49	0.05	0.58	0.05
0.58	0.09	0.67	0.13
0.67	0.11	0.78	0.24
0.78	0.09	0.91	0.33
0.91	0.07	1.06	0.40
1.06	0.06	1.24	0.46
1.24	0.04	1.44	0.50
1.44	0.02	1.68	0.52
1.68	0.01	1.95	0.53
1.95	0.02	2.28	0.55
2.28	0.03	2.65	0.57
2.65	0.04	3.09	0.62
3.09	0.07	3.60	0.68
3.60	0.09	4.19	0.78
4.19	0.11	4.88	0.89
4.88	0.13	5.69	1.02
5.69	0.15	6.63	1.16
6.63	0.17	7.72	1.33
7.72	0.21	9.00	1.55
9.00	0.30	10.48	1.85
10.48	0.45	12.21	2.30
12.21	0.69	14.22	2.99
14.22	1.04	16.57	4.03
16.57	1.61	19.31	5.64
19.31	2.11	22.49	7.65
22.49	2.62	26.20	10.47
26.20	3.58	30.53	14.05
30.53	4.35	35.56	18.41
35.56	5.09	41.43	23.49
41.43	5.75	48.27	29.25
48.27	6.33	56.23	35.58
56.23	6.83	65.51	42.40
65.51	7.22	76.32	49.62
76.32	7.51	88.91	57.13
88.91	7.71	103.58	64.84
103.58	7.83	120.67	72.67
120.67	7.33	140.58	80.00
140.58	6.47	163.77	86.47
163.77	5.32	190.80	91.79
190.80	4.01	222.28	95.81
222.28	2.71	258.95	98.51
258.95	1.40	301.68	99.91
301.68	0.09	351.46	100.00
351.46	0.00	409.45	100.00
409.45	0.00	477.01	100.00
477.01	0.00	555.71	100.00
555.71	0.00	647.41	100.00
647.41	0.00	754.23	100.00
754.23	0.00	878.67	100.00

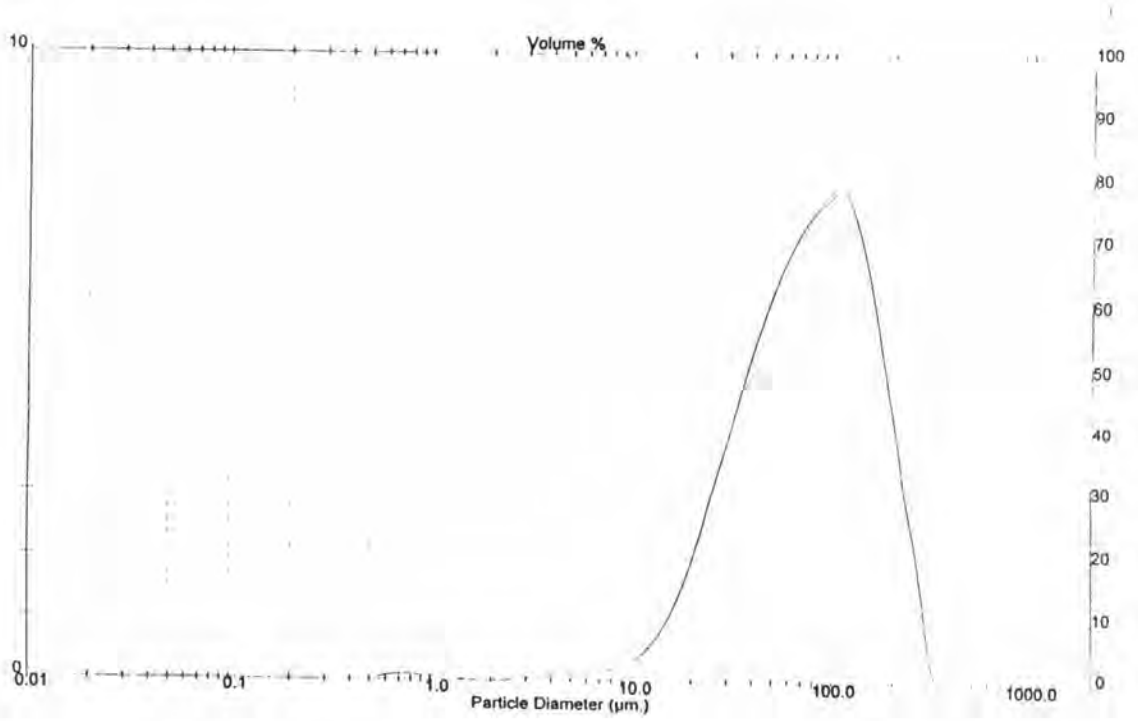


Figure 33 The curve of particle size distribution of $NaCMC_4$

Table 34 The cumulative percent undersize of M_4

Result Statistics

Distribution Type: Volume
Mean Diameters:
D [4, 3] = 100.78 um

Concentration = 0.0497 %Vol
D (v, 0.1) = 28.66 um
D [3, 2] = 38.14 um

Density = 1.000 g / cub. cm
D (v, 0.5) = 86.66 um
Span = 1.930E+00

Specific S.A. = 0.1573 sq. m / g
D (v, 0.9) = 195.78 um
Uniformity = 8.009E-01

Size_Low (um)	In %	Size_High (um)	Under%
0.49	0.05	0.58	0.05
0.58	0.09	0.67	0.15
0.67	0.12	0.78	0.26
0.78	0.11	0.91	0.37
0.91	0.10	1.06	0.47
1.06	0.09	1.24	0.56
1.24	0.07	1.44	0.63
1.44	0.06	1.68	0.68
1.68	0.05	1.95	0.73
1.95	0.05	2.28	0.79
2.28	0.06	2.65	0.85
2.65	0.07	3.09	0.92
3.09	0.09	3.60	1.01
3.60	0.10	4.19	1.12
4.19	0.11	4.88	1.23
4.88	0.11	5.69	1.34
5.69	0.11	6.63	1.44
6.63	0.11	7.72	1.55
7.72	0.13	9.00	1.68
9.00	0.18	10.48	1.86
10.48	0.29	12.21	2.15
12.21	0.48	14.22	2.63
14.22	0.75	16.57	3.38
16.57	1.14	19.31	4.52
19.31	1.64	22.49	6.17
22.49	2.28	26.20	8.42
26.20	2.94	30.53	11.37
30.53	3.66	35.56	15.03
35.56	4.39	41.43	19.41
41.43	5.09	48.27	24.51
48.27	5.78	56.23	30.29
56.23	6.44	65.51	36.73
65.51	7.03	76.32	43.75
76.32	7.54	88.91	51.29
88.91	7.98	103.58	59.27
103.58	8.35	120.67	67.62
120.67	8.03	140.58	75.65
140.58	7.29	163.77	82.94
163.77	6.16	190.80	89.09
190.80	4.78	222.28	93.88
222.28	3.41	258.95	97.29
258.95	2.04	301.68	99.33
301.68	0.67	351.46	100.00
351.46	0.00	409.45	100.00
409.45	0.00	477.01	100.00
477.01	0.00	555.71	100.00
555.71	0.00	647.41	100.00
647.41	0.00	754.23	100.00
754.23	0.00	878.67	100.00

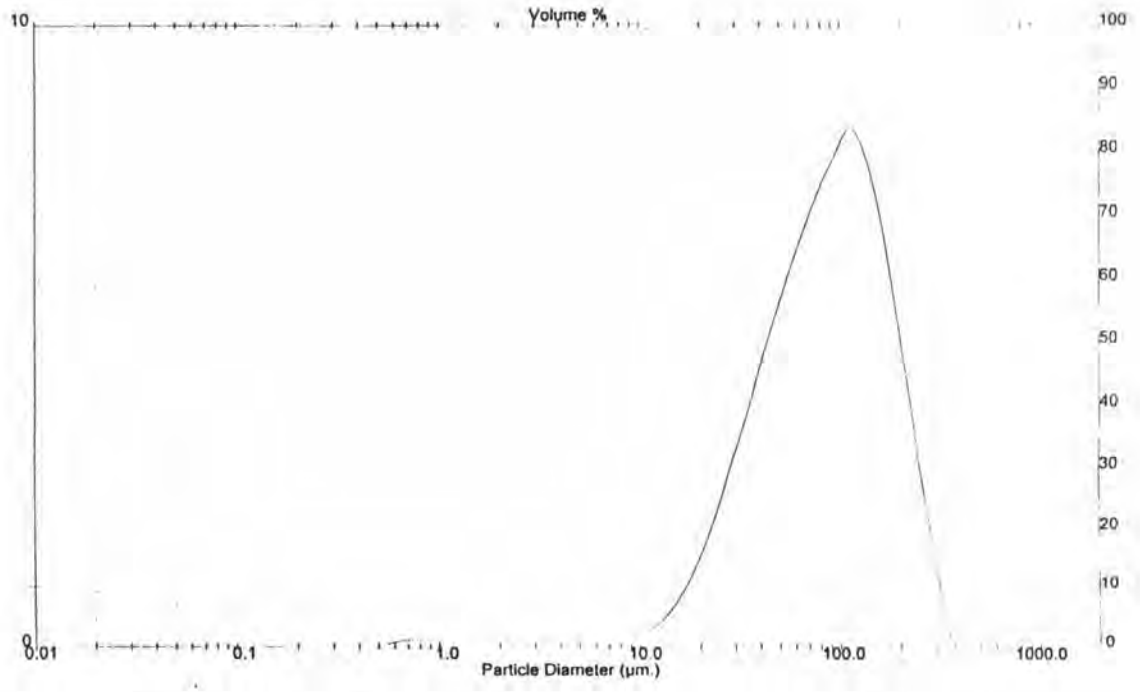


Figure 34 The curve of particle size distribution of M_4

Appendix III

Data in statistical processes

Table 35 Analysis of variance for phosphate content of modified sodium carboxymethylcellulose at various cross-linking time

Source of variation	df	SS	MS	F-value
Among group	3	0.0036	0.0012	0.8574
Within group	8	0.0111	0.0014	
Total	11	0.0146		

$F_{0.05}(3,8) = 4.07$

Table 36 Dependent comparision (Duncan's new multiple range test) for phosphate content of modified sodium carboxymethylcellulose at various cross-linking time

	M,6*	M,12	M,24	M,3
M,6	-			
M,12	NS**	-		
M,24	NS	NS	-	
M,3	NS	NS	NS	-

* M,6 = sodium carboxymethylcellulose cross-linked for 6 hours

** NS = Non-significant

Table 37 Analysis of variance for viscosity of modified sodium carboxymethylcellulose at various cross-linking time

Source of variation	df	SS	MS	F-value
Among group	3	1098.1670	366.3056	4.4133
Within group	8	664.0000	83.0000	
Total	11	1762.9167		

$F_{0.05}(3,8) = 4.07$

Table 38 Dependent comparision (Duncan's new multiple range test) for viscosity of modified sodium carboxymethylcellulose at various cross-linking time

	M,6	M,3	M,12	M,24
M,6	-			
M,3	NS*	-		
M,12	NS	NS	-	
M,24	S**	NS	NS	-

* NS = Non-significant

** S = Significant

Table 39 Analysis of variance for phosphate content of modified sodium carboxymethylcellulose

Source of variation	df	SS	MS	F-value
Among group	5	48.4172	9.6834	10,253.06
Within group	12	0.0113	0.0009	
Total	17	48.4286		

$F_{0.05}(5,12) = 3.11$

Table 40 Dependent comparision (Duncan's new multiple range test) for phosphate content of modified sodium carboxymethylcellulose

	$NaCMC_3$	$NaCMC_2 + Na_3P_3O_9$	M_4	M_2	M_3	M_1
$NaCMC_3$	-					
$NaCMC_2 + Na_3P_3O_9$	S*	-				
M_4	S	S	-			
M_2	S	S	S	-		
M_3	S	S	S	NS**	-	
M_1	S	S	S	S	S	-

* S = Significant

** NS = Non-significant

Table 41 Analysis of variance for viscosity of sodium carboxymethylcellulose and modified sodium carboxymethylcellulose

Source of variation	df	SS	MS	F-value
Among group	9	1934472.9200	214941.4356	248.3447
Within group	20	17309.9267	865.4963	
Total	29	1951782.8470		

$F_{0.05}(9,20) = 2.41$

Table 42 Dependent comparision (Duncan's new multiple range test) for viscosity of sodium carboxymethylcellulose and modified sodium carboxymethylcellulose

	$NaCMC_1$	M_1	M_2	M_3	M_4	M_5 (no $Na_3P_3O_9$)	$NaCMC_2$	$NaCMC_3$	$NaCMC_3$ + $Na_3P_3O_9$	$NaCMC_4$
$NaCMC_1$	-									
M_1	NS*	-								
M_2	S**	S	-							
M_3	S	S	NS	-						
M_4	S	S	S	NS	-					
M_5 (no $Na_3P_3O_9$)	S	S	S	S	S	-				
$NaCMC_2$	S	S	S	S	S	NS	-			
$NaCMC_3$	S	S	S	S	S	S	S	-		
$NaCMC_3$ + $Na_3P_3O_9$	S	S	S	S	S	S	S	S	-	
$NaCMC_4$	S	S	S	S	S	S	S	S	S	-

* NS = Non-significant

** S = Significant

Table 43 Analysis of variance for volume of water uptake of disintegrants

Source of variation	df	SS	MS	F-value
Among group	11	93.2804	8.48	1565.864
Within group	24	0.1300	0.0054	
Total	35	93.4103		

$F_{0.05}(11,24) = 2.20$

Table 44 Dependent comparision (Duncan's new multiple range test) for volume of water uptake of disintegrants

	corn starch	$NaCMC_4$	M_1	$NaCMC_1$	Nymcel®	$NaCMC_3$	M_3	M_4	$NaCMC_2$	M_2	Ac-di-sol®	Primoje
corn starch	-											
$NaCMC_4$	S*	-										
M_1	S	NS**	-									
$NaCMC_1$	S	NS	NS	-								
Nymcel®	S	S	NS	NS	-							
$NaCMC_3$	S	S	NS	NS	NS	-						
M_3	S	S	S	NS	NS	NS	-					
M_4	S	S	S	NS	NS	NS	NS	-				
$NaCMC_2$	S	S	S	S	NS	NS	NS	NS	-			
M_2	S	S	S	S	S	S	S	S	S	-		
Ac-di-sol®	S	S	S	S	S	S	S	S	S	S	-	
Primojel®	S	S	S	S	S	S	S	S	S	S	S	-

* S = Non-significant

** NS = Significant

Table 45 Analysis of variance for rate of water uptake of disintegrants

Source of variation	df	SS	MS	F-value
Among group	11	13.22	1.20	44.80
Within group	24	0.64	0.03	
Total	35	13.86		

$F_{0.05}(11,24) = 2.20$

Table 46 Dependent comparision (Duncan's new multiple range test) for rate of water uptake of disintegrants

	$NaCMC_3$	$NaCMC_1$	$NaCMC_4$	Nymcel®	M_4	M_1	corn starch	$NaCMC_2$	M_3	M_2	Ac-di-sol®	Primojel®
$NaCMC_3$	-											
$NaCMC_1$	NS*	-										
$NaCMC_4$	NS	NS	-									
Nymcel®	NS	NS	NS	-								
M_4	NS	NS	NS	NS	-							
M_1	NS	NS	NS	NS	NS	-						
corn starch	NS	NS	NS	NS	NS	NS	-					
$NaCMC_2$	NS	NS	NS	NS	NS	NS	NS	-				
M_3	S**	S	S	NS	NS	NS	NS	NS	-			
M_2	S	S	S	S	S	S	S	S	NS	-		
Ac-di-sol®	S	S	S	S	S	S	S	S	S	S	-	
Primojel®	S	S	S	S	S	S	S	S	S	S	S	-

* NS = Non-significant

** S = Significant

Table 47 Analysis of variance for sedimentation volume of disintegrants

Source of variation	df	SS	MS	F-value
Among group	2	443.8790	221.9395	9390.9525
Within group	6	0.1418	0.0236	
Total	8	444.0208		

$F_{0.05}(2,6) = 5.14$

Table 48 Dependent comparision (Duncan's new multiple range test) for sedimentation volume of disintegrants

	corn starch	Ac-di-sol®	Primojel®
corn starch	-		
Ac-di-sol®	S*	-	
Primojel®	S	S	-

* S = Significant

Table 49 Analysis of variance for hydration capacity of disintegrants

Source of variation	df	SS	MS	F-value
Among group	2	439.3948	219.6974	1,971.9524
Within group	6	0.685	0.1114	
Total	8	440.06		

$F_{0.05}(2,6) = 5.14$

Table 50 Dependent comparision (Duncan's new multiple range test) for hydration capacity of disintegrants

	corn starch	Ac-di-sol®	Primojel®
corn starch	-		
Ac-di-sol®	S*	-	
Primojel®	S	S	-

* S = Significant

Table 51 Analysis of variance for disintegration time of paracetamol tablets containing various disintegrants

Source of variation	df	SS	MS	F-value
Among group	6	6,015.8166	1002.6361	2,002.6116
Within group	35	17.5232	0.5007	
Total	41	6,033.3398		

$F_{0.05}(6,35) = 2.09$

Table 52 Dependent comparision (Duncan's new multiple range test) for disintegration time of paracetamol tablets containing various disintegrants

	Ac-di-sol®	Primojel®	Nymcel®	corn starch	M_4	blank	$NaCMC_4$
Ac-di-sol®	-						
Primojel®	NS*	-					
Nymcel®	NS	NS	-				
corn starch	S**	S	S	-			
M_4	S	S	S	S	-		
blank	S	S	S	S	S	-	
$NaCMC_4$	S	S	S	S	S	NS	-

* NS = Non-significant

** S = Significant

Table 53 Analysis of variance for dissolution of paracetamol tablets containing various disintegrants

Source of variation	df	SS	MS	F-value
Among group	6	30084.0054	5,014.0009	3,095.7812
Within group	14	22.6777	1.6196	
Total	20	30106.6801		

$F_{0.05}(6,14) = 2.64$

Table 54 Dependent comparision (Duncan's new multiple range test) for dissolution of paracetamol tablets containing various disintegrants

	$NaCMC_4$	blank	Nymcel®	Primojel®	corn starch	Ac-di-sol®	M_4
$NaCMC_4$	-						
blank	S*	-					
Nymcel®	S	S	-				
Primojel®	S	S	S	-			
corn starch	S	S	S	NS**	-		
Ac-di-sol®	S	S	S	S	S	-	
M_4	S	S	S	S	S	NS	-

* S = Significant

** NS = Non-significant

Appendix IV

Table 55 The ratio of phosphorus cross-linked of modified sodium carboxymethylcellulose

Material	Absorption peak height		Calculated absorption peak height at about 1020 cm^{-1}	Ratio
	At 2000 cm^{-1}	At about 1020 cm^{-1}		
M_1	63.99	*	-	-
M_2	63.81	30.13	28.33	1.000
M_3	52.18	24.75	28.46	1.004
M_4	59.22	27.58	27.94	0.986

* The peak absorption was not found

Calculation

1. The absorption peak of material at 2000 cm^{-1} was standardized to 60.00, calculate the absorption peak at about 1020 cm^{-1}
2. Use the calculated absorption peak at about 1020 cm^{-1} of M_2 as a reference, calculated the ratio of absorption peak height

Example

M_3 ; absorption peak of material at 2000 cm^{-1} = 52.18 $\rightarrow$ 60

absorption peak of material at 1020 cm^{-1} $= \frac{60 \times 24.75}{52.18}$

$= 28.46$

the ratio $= \frac{28.46}{28.33}$

$= 1.004$

VITAE

Miss Neeranuch Phuvagul was born on January 12, 1969, in Bangkok, Thailand. She got her degree in Bachelor of Science in Pharmacy in 1990 from Faculty of Pharmacy, Chiangmai University, Chiangmai, Thailand.