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APPENDIX

Appendix

A1. Whiteness of bleaching bagasse at several concentration of H_2O_2

H_2O_2 (%)	L*	a*	b*	WI-ASTM	YI-E313
0	58.54	2.39	29.61	N/A	69.9
2	91.95	-1.78	7.96	40.97	13.75
4	92.18	-1	5.2	54.73	9.24
6	92.8	-0.59	4.04	61.62	7.35
8	91.31	-0.61	2.97	64.17	5.36
10	90.32	-0.46	1.77	68.18	3.16

A2. Whiteness of bleaching banana stem at several concentration of H_2O_2

H_2O_2 (%)	L*	a*	b*	WI-ASTM	YI-E313
0	64.09	4.25	15.22	N/A	41.09
2	84.08	-0.46	7.88	30.61	15.73
4	10.74	-0.65	5.47	41.16	10.74
6	86.15	-.0.74	5.16	45.08	9.90
8	88.39	-0.63	6.12	44.19	11.50
10	85.99	-0.63	4.78	46.39	9.24

A3. Average particle size of bleached bagasse and banana stem at various grinding times

Time (min)	Average particle size	
	Bleached bagasse pulp (μm)	Bleached banana stem pulp (μm)
1 min	162.71	179.00
2 min	71.76	167.67
3 min	80.14	58.29
4 min	69.19	39.28
5 min	57.84	89.16

A4. Data of solvent (t_0) and cellulose solution (t_n) flow times for determination of the degree of polymerization (DP) of bleached bagasse pulp

Sample No.	Flow times (sec.)					
	t_0	t_1	t_2	t_3	t_4	t_5
1	12	166	96	62	49	30
2	12	169	98	64	48	32
3	12	165	95	65	47	31
Average flow time	12	166.67	96.33	63.67	48	31
SD	0	2.08	1.53	1.53	1	1
Concentration (c) g/dl	-	1	0.8	0.6	0.4	0.2
η_{rel}	-	13.88	8.03	5.31	4	2.58
log[(η_{rel}-1)/c]	-	1.11	0.94	0.86	0.88	0.90
η	6.15					
DP	11685					

A5. Data of solvent (t_0) and cellulose solution (t_n) flow times for determination of the degree of polymerization (DP) of hydrolyzed bagasse prepared using 2.5 N HCl for 30 min

Sample No.	Flow times (sec.)					
	t_0	t_1	t_2	t_3	t_4	t_5
1	12	44	34	28	21	17
2	12	44	35	28	21	17
3	12	44	35	29	21	17
Average flow time	12	44	34.67	28.33	21	17
SD	0	0	0.58	0.58	0	0
Concentration (c) g/dl	-	1	0.8	0.6	0.4	0.2
η_{rel}	-	3.67	2.89	2.36	1.75	1.41
log[(η_{rel}-1)/c]	-	0.78	0.62	0.52	0.50	0.35
η	1.79					
DP	341.17					

A6. Data of solvent (t_0) and cellulose solution (t_n) flow times for determination of the degree of polymerization (DP) of hydrolyzed bagasse prepared using 2.5 N HCl for 60 min

Sample No.	Flow times (sec.)					
	t_0	t_1	t_2	t_3	t_4	t_5
1	12	82	50	30	24	18
2	12	82	50	30	25	18
3	12	82	51	29	24	19
Average flow time	12	82	50.33	29.67	24.33	19.33
SD	0	0	0.58	0.58	0.58	0.58
Concentration (c) g/dl	-	1	0.8	0.6	0.4	0.2
η_{rel}	-	6.83	4.19	2.47	2.02	1.53
log[(η_{rel}-1)/c]	-	0.77	0.60	0.39	0.41	0.42
η	1.792					
DP	340.6					

A7. Data of solvent (t_0) and cellulose solution (t_n) flow times for determination of the degree of polymerization (DP) of hydrolyzed bagasse prepared using 2.5 N HCl for 120 min

Sample No.	Flow times (sec.)					
	t_0	t_1	t_2	t_3	t_4	t_5
1	12	42	33	27	20	16
2	12	41	33	26	20	15
3	12	40	32	26	20	15
Average flow time	12	41	32.67	26.33	20	15.33
SD	0	1	0.58	0.58	0	0.58
Concentration (c) g/dl	-	1	0.8	0.6	0.4	0.2
η_{rel}	-	3.42	2.72	2.19	1.67	1.28
log[(η_{rel}-1)/c]	-	0.38	0.33	0.30	0.22	0.14
η	1.25					
DP	238					

A8. Data of solvent (t_0) and cellulose solution (t_n) flow times for determination of the degree of polymerization (DP) of hydrolyzed bagasse prepared using 2.5 N HCl for 180 min

Sample No.	Flow times (sec.)					
	t_0	t_1	t_2	t_3	t_4	t_5
1	12	44	30	28	22	15
2	12	44	32	28	22	15
3	12	45	30	28	21	15
Average flow time	12	44.33	30.67	28	21.66	15
SD	-	0.58	1.15	0	0.58	0
Concentration (c) g/dl	-	1	0.8	0.6	0.4	0.2
η_{rel}	-	3.69	2.56	2.33	1.81	1.25
$\log[(\eta_{rel}-1)/c]$	-	0.43	0.29	0.35	0.30	0.10
η	1.25					
DP	237					

A9. Data of solvent (t_0) and cellulose solution (t_n) flow times for determination of the degree of polymerization (DP) of hydrolyzed bagasse prepared using 2.5 N H_2SO_4 for 30 min

Sample No.	Flow times (sec.)					
	t_0	t_1	t_2	t_3	t_4	t_5
1	12	44	34	28	21	17
2	12	44	35	28	21	17
3	12	44	35	29	21	17
Average flow time	12	44	34.67	28.33	21	17
SD	0	0	0.58	0.58	0	0
Concentration (c) g/dl	-	1	0.8	0.6	0.4	0.2
η_{rel}	-	3.67	2.89	2.36	1.75	1.42
$\log[(\eta_{rel}-1)/c]$	-	0.43	0.37	0.36	0.27	0.32
η	1.79					
DP	341					

A10. Data of solvent (t_0) and cellulose solution (t_n) flow times for determination of the degree of polymerization (DP) of hydrolyzed bagasse prepared using 2.5 N H_2SO_4 for 60 min

Sample No.	Flow times (sec.)					
	t_0	t_1	t_2	t_3	t_4	t_5
1	12	39	31	23	19	16
2	12	38	31	23	20	15
3	12	38	31	24	20	15
Average flow time	12	38.33	31	23.33	19.67	15.33
SD	0	0.58	0	0.58	0.58	0.58
Concentration (c) g/dl	-	1	0.8	0.6	0.4	0.2
η_{rel}	-	3.19	2.58	1.94	1.64	1.28
$\log[(\eta_{rel}-1)/c]$	-	0.34	0.30	0.20	0.20	0.14
η	1.227					
DP	233.22					

A11. Data of solvent (t_0) and cellulose solution (t_n) flow times for determination of the degree of polymerization (DP) of hydrolyzed bagasse prepared using 2.5 N H_2SO_4 for 120 min

Sample No.	Flow times (sec.)					
	t_0	t_1	t_2	t_3	t_4	t_5
1	12	40	31	24	20	15
2	12	40	31	24	20	15
3	12	39	31	24	19	16
Average flow time	12	39.67	31	24	19.67	15.33
SD	0	0.58	0	0	0.58	0.58
Concentration (c) g/dl	-	1	0.8	0.6	0.4	0.2
η_{rel}	-	3.31	2.58	2	1.64	1.28
$\log[(\eta_{rel}-1)/c]$	-	0.36	0.30	0.22	0.20	0.14
η	1.22					
DP	231.50					

A12. Data of solvent (t_0) and cellulose solution (t_n) flow times for determination of the degree of polymerization (DP) of hydrolyzed bagasse prepared using 2.5 N H_2SO_4 for 180 min

Sample No.	Flow times (sec.)					
	t_0	t_1	t_2	t_3	t_4	t_5
1	12	40	31	25	21	15
2	12	40	31	25	21	15
3	12	40	31	25	21	15
Average flow time	12	40	31	25	21	15
SD	0	0	0	0	0	0
Concentration (c) g/dl	-	1	0.8	0.6	0.4	0.2
η_{rel}	-	3.33	2.58	2.08	1.75	1.25
$\log[(\eta_{rel}-1)/c]$	-	0.37	0.30	0.26	0.27	0.10
η	1.22					
DP	231					

A13. Data of solvent (t_0) and cellulose solution (t_n) flow times for determination of the degree of polymerization (DP) of bleached banana stem pulp

Sample No.	Flow times (sec.)					
	t_0	t_1	t_2	t_3	t_4	t_5
1	12	190	132	83	59	29
2	12	190	132	83	59	29
3	12	189	132	82	58	30
Average flow time	12	189.67	132	82.67	58.67	29.33
SD	0	0.58	0	0.58	0.58	0.58
Concentration (c) g/dl	-	1	0.8	0.6	0.4	0.2
η_{rel}	-	15.81	11	6.89	4.89	2.44
$\log[(\eta_{rel}-1)/c]$	-	1.17	1.10	0.99	0.99	0.86
η	6.328					
DP	12024					

A14. Data of solvent (t_0) and cellulose solution (t_n) flow times for determination of the degree of polymerization (DP) of hydrolyzed banana stem prepared using 2.5 N HCl for 30 min

Sample No.	Flow times (sec.)					
	t_0	t_1	t_2	t_3	t_4	t_5
1	12	80	49	30	24	18
2	12	80	49	30	25	18
3	12	81	49	29	24	19
Average flow time	12	80.33	49	29.67	24.33	18.33
SD	0	0.58	0	0.58	0.58	0.58
Concentration (c) g/dl	-	1	0.8	0.6	0.4	0.2
η_{rel}	-	6.69	4.08	2.47	2.03	1.53
$\log[(\eta_{rel}-1)/c]$	-	0.76	0.59	0.39	0.41	0.42
η	1.82					
DP	345.10					

A15. Data of solvent (t_0) and cellulose solution (t_n) flow times for determination of the degree of polymerization (DP) of hydrolyzed banana stem prepared using 2.5 N HCl for 60 min

Sample No.	Flow times (sec.)					
	t_0	t_1	t_2	t_3	t_4	t_5
1	12	43	36	29	21	16
2	12	42	36	29	22	16
3	12	43	36	30	22	16
Average flow time	12	4.67	36	29.33	21.67	16
SD	0	0.58	0	0.58	0.58	0
Concentration (c) g/dl	-	1	0.8	0.6	0.4	0.2
η_{rel}	-	3.56	2	1.44	0.81	0.33
$\log[(\eta_{rel}-1)/c]$	-	0.44	0.40	0.38	0.30	0.22
η	1.60					
DP	303.21					

A16. Data of solvent (t_0) and cellulose solution (t_n) flow times for determination of the degree of polymerization (DP) of hydrolyzed banana stem prepared using 2.5 N HCl for 120 min

Sample No.	Flow times (sec.)					
	t_0	t_1	t_2	t_3	t_4	t_5
1	12	36	31	25	19	15
2	12	36	31	24	19	15
3	12	36	31	24	19	16
Average flow time	12	36	31	24.33	19	15.33
SD	0	0	0	0.58	0	0.58
Concentration (c) g/dl	-	1	0.8	0.6	0.4	0.2
η_{rel}	-	3	2.58	2.03	1.58	1.28
$\log[(\eta_{rel}-1)/c]$	-	0.30	0.30	0.23	0.16	0.14
η	1.24					
DP	235					

A17. Data of solvent (t_0) and cellulose solution (t_n) flow times for determination of the degree of polymerization (DP) of hydrolyzed banana stem prepared using 2.5 N HCl for 180 min

Sample No.	Flow times (sec.)					
	t_0	t_1	t_2	t_3	t_4	t_5
1	12	34	28	25	19	15
2	12	34	28	24	19	15
3	12	34	28	25	20	15
Average flow time	12	34	28	24.67	19.33	15
SD	0	0	0	0.58	0.58	15
Concentration (c) g/dl	-	1	0.8	0.6	0.4	0.2
η_{rel}	-	2.83	2.33	2.06	1.61	1.25
log[(η_{rel}-1)/c]	-	0.26	0.22	0.25	0.18	0.10
η	1.23					
DP	234					

A18. Data of solvent (t_0) and cellulose solution (t_n) flow times for determination of the degree of polymerization (DP) of hydrolyzed banana stem prepared using 2.5 N H_2SO_4 for 30 min

Sample No.	Flow times (sec.)					
	t_0	t_1	t_2	t_3	t_4	t_5
1	12	45	33	24	21	16
2	12	45	33	23	20	16
3	12	45	34	24	20	16
Average flow time	12	45	33.33	23.67	20.33	16
SD	0	0	0.58	0.58	0.58	0
Concentration (c) g/dl	-	1	0.8	0.6	0.4	0.2
η_{rel}	-	3.75	2.78	1.97	1.69	1.33
$\log[(\eta_{rel}-1)/c]$	-	0.44	0.35	0.21	0.24	0.22
η	1.35					
DP	255.59					

A19. Data of solvent (t_0) and cellulose solution (t_n) flow times for determination of the degree of polymerization (DP) of hydrolyzed banana stem prepared using 2.5 N H_2SO_4 for 60 min

Sample No.	Flow times (sec.)					
	t_0	t_1	t_2	t_3	t_4	t_5
1	12	36	30	26	19	16
2	12	36	30	25	18	15
3	12	36	31	25	19	15
Average flow time	12	36	30.33	25.33	18.67	15.33
SD	0	0	0.58	0.58	0.58	0.58
Concentration (c) g/dl	-	1	0.8	0.6	0.4	0.2
η_{rel}	-	3	2.53	2.11	1.56	1.28
$\log[(\eta_{rel}-1)/c]$	-	0.30	0.28	0.27	0.14	0.14
η	1.28					
DP	234					

A20. Data of solvent (t_0) and cellulose solution (t_n) flow times for determination of the degree of polymerization (DP) of hydrolyzed banana stem prepared using 2.5 N H_2SO_4 for 120 min

Sample No.	Flow times (sec.)					
	t_0	t_1	t_2	t_3	t_4	t_5
1	12	39	34	24	19	15
2	12	39	34	25	20	16
3	12	39	34	25	20	15
Average flow time	12	39	34	24.67	19.67	15.33
SD	0	0	0	0.58	0.58	0.58
Concentration (c) g/dl	-	1	0.8	0.6	0.4	0.2
η_{rel}	-	3.25	2.83	2.06	1.64	1.28
log[(η_{rel}-1)/c]	-	0.35	0.36	0.25	0.20	0.14
η	1.22					
DP	232					

A21. Data of solvent (t_0) and cellulose solution (t_n) flow times for determination of the degree of polymerization (DP) of hydrolyzed banana stem prepared using 2.5 N H_2SO_4 for 180 min

Sample No.	Flow times (sec.)					
	t_0	t_1	t_2	t_3	t_4	t_5
1	12	38	28	24	21	15
2	12	38	28	24	20	15
3	12	38	28	24	20	15
Average flow time	12	38	28	24	20.33	15
SD	0	0	0	0	0.58	0
Concentration (c) g/dl	-	1	0.8	0.6	0.4	0.2
η_{rel}	-	3.17	2.33	2	1.69	1.25
$\log[(\eta_{rel}-1)/c]$	-	0.34	0.22	0.22	0.24	0.10
η	1.0972					
DP	231					

A22. Data of solvent (t_0) and cellulose solution (t_n) flow times for determination of the degree of polymerization (DP) of commercial microcrystalline cellulose

Sample No.	Flow times (sec.)					
	t_0	t_1	t_2	t_3	t_4	t_5
1	12	72	47	37	24	17
2	12	71	47	37	24	18
3	12	71	47	37	24	18
Average flow time	12	71.33	47	37	24	17.67
SD	0	0.58	0	0	0	0.58
Concentration (c) g/dl	-	1	0.8	0.6	0.4	0.2
η_{rel}	-	5.94	3.92	3.08	2	1.47
$\log[(\eta_{rel}-1)/c]$	-	0.69	0.56	0.54	0.40	0.37
η	1.87					
DP	355.26					

A23. Data for haze of biocomposite film

MCC Content (wt%)	Haze				
	H_2SO_4-BG /starch	HCl-BG /starch film	H_2SO_4-BS /starch	HCl-BS /starch film	CM/ starch film
0	13.68	13.68	13.68	13.68	13.68
5	55.25	36.1	56.36	52.03	58.4
10	62.49	57.42	68.49	57.42	69.49
15	78.8	71.31	79.31	72.42	83.11
20	82.13	74.14	84.51	82.33	90.47
25	88.61	80.56	93.75	83.93	96.35
30	92.86	91.74	98.25	86.7	98.25

A24. Data for tensile strength of HCl-BG MCC/starch films

MCC content (wt%)	Tensile strength (MPa)						
	X_1	X_2	X_3	X_4	X_5	Mean	SD
0	3.2	3.19	2.07	3.05	3.03	2.908	0.47
5	4.19	4.71	4.25	3.75	3.4	4.06	0.50
10	4.19	4.71	4.25	3.75	3.6	4.10	0.44
15	5.18	5.56	5.88	4.14	5.79	5.43	0.47
20	6.66	6.47	6.56	6.22	6.96	6.57	0.27
25	8.82	8.73	8.10	8.72	8.43	8.56	0.30
30	11.73	12.07	10.70	13.5	9.51	11.50	1.50
40	11.03	12.49	11.46	11.76	10.08	10.08	0.89

A25. Data for tensile strength of H_2SO_4-BG MCC/starch films

MCC Content (wt%)	Tensile strength (MPa)						
	X_1	X_2	X_3	X_4	X_5	Mean	SD
0	3.2	3.19	2.07	3.05	3.03	2.908	0.47
5	5.08	5.19	5.00	5.41	5.98	5.33	0.39
10	11.63	10.81	10.91	11.81	13.48	11.72	1.07
15	3.19	5.09	4.19	5.85	5.80	4.83	1.13
20	5.43	5.4	5.35	5.82	5.75	5.55	0.22
25	5.65	4.20	6.20	6.22	6.64	5.78	0.95
30	5.86	6.79	5.61	5.43	6.61	6.06	0.61
40	7.07	6.85	6.88	7.62	5.34	6.75	0.84

A26. Data for tensile strength of HCl-BS MCC/starch films

MCC Content (wt%)	Tensile strength (MPa)						
	X_1	X_2	X_3	X_4	X_5	Mean	SD
0	3.2	3.19	2.07	3.05	3.03	2.908	0.47
5	3.43	3.73	3.95	4.03	5.17	4.06	0.66
10	4.91	4.13	4.05	3.89	4.17	4.23	0.39
15	11.09	15.52	11.95	10.84	19.41	13.76	3.67
20	3.6	3.38	4.4	4.2	4.7	4.05	0.55
25	8.6	8.36	7.4	6.2	7.7	7.65	0.94
30	7.76	6.7	8.8	8.3	7.08	7.59	0.91
40	5.7	5.11	2.1	5.44	5.67	4.80	1.53

A27. Data for tensile strength of H_2SO_4-BS MCC/starch films

MCC Content (wt%)	Tensile strength (MPa)						
	X_1	X_2	X_3	X_4	X_5	Mean	SD
0	3.2	3.19	2.07	3.05	3.03	2.908	0.47
5	6.70	5.42	5.90	6.18	6.62	6.36	0.33
10	6.7	6.41	6.17	6.63	6.62	6.51	0.21
15	14.84	13.36	14.92	14.35	13.54	0.64	0.64
20	15.33	15.61	15.1	14.01	16.76	15.36	0.99
25	7.25	7.20	7.92	7.75	7.43	7.51	0.31
30	6.05	6.69	6.81	6.24	6.83	6.5	0.36
40	12.3	2.45	5.12	5.51	7.71	6.62	3.68

A28. Data for tensile strength of CM MCC/starch films

MCC Content (wt%)	Tensile strength (MPa)						
	X_1	X_2	X_3	X_4	X_5	Mean	SD
0	3.2	3.19	2.07	3.05	3.03	2.908	0.47
5	9.89	9.42	10.10	9.44	9.42	9.65	0.32
10	11.05	11.05	10.77	10.73	10.23	10.76	0.34
15	7.81	7.64	7.29	7.5	7.14	7.48	0.27
20	4.39	6.77	7.22	7.02	6.16	6.31	1.14
25	7.41	7.29	7.02	7.31	7.65	7.34	0.23
30	4.4	5.64	4.88	5.01	4.28	4.84	0.54
40	4.80	5.55	4.54	4.83	4.36	4.82	0.45

A29. Data for Young's modulus of HCl-BG MCC/starch films

MCC Content (wt%)	Young's modulus (MPa)						
	X_1	X_2	X_3	X_4	X_5	Mean	SD
0	119.05	128.03	164.52	154.13	121.15	137.37	20.64
5	209.60	132.27	102.48	290.87	213.43	189.73	74.32
10	157.146	273.524	269.50	299.36	148.08	229.52	63.69
15	247.98	369.02	373.75	218.41	336.51	309.14	71.55
20	398	346.68	385.73	424.01	460.30	403.12	42.45
25	545	506.01	470.55	471.71	408.14	480.28	50.55
30	736.21	1009.26	959.10	870.06	719.95	858.92	129.55
40	789.58	721.15	818.98	818.38	857.45	801.11	50.79

A30. Data for Young's modulus of H_2SO_4 -BG MCC/starch films

MCC Content (wt%)	Young's modulus (MPa)						
	X_1	X_2	X_3	X_4	X_5	Mean	SD
0	119.05	128.03	164.52	154.13	121.15	137.37	20.64
5	250	236	202.195	234	215	227.65	18.90
10	524.18	467.78	536.94	553.76	625.62	541.66	56.96
15	181.99	265.25	182.71	213	276	223.79	44.71
20	265.48	229.40	211.57	307.00	237.36	237.36	250.17
25	248	365.41	299.27	281.38	288.15	296.44	43.03
30	325.47	378.57	291.93	333.77	473.96	360.74	70.43
40	475.96	394.17	404.06	459.16	385.78	423.83	40.88

A32. Data for Young's modulus of HCl-BS MCC/starch films

MCC Content (wt%)	Young's modulus (MPa)						
	X_1	X_2	X_3	X_4	X_5	Mean	SD
0	119.05	128.03	164.52	154.13	121.15	137.37	20.64
5	175.42	214.86	224.95	244.29	244.29	246.52	25.78
10	278.55	245.05	212.34	303.14	249.08	257.63	34.60
15	450.10	513.83	418.67	398.84	377.22	431.73	53.15
20	504.32	521.93	426.34	498.30	398.70	469.92	54.00
25	432.9	477.09	526.11	705.83	535.48	535.48	119.78
30	422.51	284.85	433.7	244.77	348.52	346.87	82.97
40	543.11	552.23	209.11	186.5	178.34	333.85	195.53

A33. Data for Young's modulus of H_2SO_4 -BS MCC/starch films

MCC Content (wt%)	Young's modulus (MPa)						
	X_1	X_2	X_3	X_4	X_5	Mean	SD
0	119.05	128.03	164.52	154.13	121.15	137.37	20.64
5	198	223	274	230	270	239	25.78
10	299.12	302.2	269	280	361.84	302.43	35.92
15	86	754.51	802.53	534.21	700.85	600.5	29.81
20	771	703	685	670	752.83	716.37	43.67
25	432.90	477.09	526.1	605	676	543.42	97.83
30	470.14	516.47	496.20	501.76	512.22	499.35	18.22
40	485	498	498	486	512	495	11.01

A34. Data for Young's modulus of CM MCC/starch films

MCC Content (wt%)	Young's modulus (MPa)						
	X_1	X_2	X_3	X_4	X_5	Mean	SD
0	119.05	128.03	164.52	154.13	121.15	137.37	20.64
5	615	608.62	516.75	500.88	379.08	524.15	96.31
10	605.96	652.53	713.31	585.66	569.95	625.48	58.09
15	538.30	606.04	575.64	753.42	517.26	598.13	93.28
20	399.53	427.89	461.40	453.40	498.38	448.12	37.08
25	569.4	495.38	489.70	437.61	604.47	519.31	66
30	380.54	450.12	340.12	406.54	382.51	392.13	40.05
40	288.00	424.49	330.22	262.58	308.46	322.75	62.13

A35. Data for %Elongation at break of HCl-BG MCC/starch films

MCC Content (wt%)	% Elongation at break						
	X_1	X_2	X_3	X_4	X_5	Mean	SD
0	60	74	32	66.92	41.53	54.89	17.59
5	26.54	27.33	26.55	23.44	29.56	26.68	2.19
10	19.45	19.56	22.27	17.57	21	19.97	1.77
15	23.72	29.45	32.9	40.2	28.96	31.04	6.07
20	10.99	19.95	6.91	10.22	4.66	10.54	5.84
25	5.73	8.95	7.55	10.12	7.81	8.03	1.64
30	3.56	2.12	2.12	3.29	2.60	2.74	0.66
40	2.83	3.11	2.97	3.28	3	3.06	0.19

A36. Data for %Elongation at break of H_2SO_4 -BG MCC/starch films

MCC Content (wt%)	% Elongation at break						
	X_1	X_2	X_3	X_4	X_5	Mean	SD
0	60	74	32	66.92	41.53	54.89	17.59
5	12.39	5.42	5.43	8.64	4.21	7.22	3.33
10	6.73	11.57	5.24	5.65	4.58	6.75	2.80
15	4.52	4.47	11.42	6.63	5.54	6.52	2.87
20	6.77	7.66	5.5	5.49	6.45	6.37	0.91
25	4.75	2.60	4.07	4.08	4.73	3.81	3.99
30	5.34	3.50	4.18	7.33	3.00	4.67	1.72
40	3.12	8.32	5.26	5.41	4.45	5.31	1.91

A35. Data for %Elongation at break of HCl-BS MCC/starch films

MCC Content (wt%)	% Elongation at break						
	X_1	X_2	X_3	X_4	X_5	Mean	SD
0	60	74	32	66.92	41.53	54.89	17.59
5	25.05	14.28	8.02	19.06	6	14.48	7.84
10	29.5	34.7	27.3	22.39	3.92	23.55	11.84
15	11.09	15.52	11.95	10.84	19.41	13.76	3.67
20	8.6	8.38	7.4	6.2	7.7	7.67	0.95
25	7.76	4.19	5.45	3.82	3.82	5.31	1.78
30	7.08	6.7	8.8	8.3	7.08	7.59	0.91
40	5.7	5.11	2.1	5.44	5.67	4.80	1.53

A36. Data for %Elongation at break of H_2SO_4 -BS MCC/starch films

MCC Content (wt%)	% Elongation at break						
	X_1	X_2	X_3	X_4	X_5	Mean	SD
0	60	74	32	66.92	41.53	54.89	17.59
5	28.43	22.53	22.3	28.4	28.1	25.95	3.23
10	17.81	12.86	19.87	13.63	14.48	15.73	2.99
15	14.84	13.36	14.92	14.35	13.98	13.54	0.64
20	15.33	15.61	15.1	14.01	16.76	15.36	0.98
25	5.51	4.3	3.5	4.4	4.7	4.48	0.73
30	3.96	4.56	3.56	4.42	4.45	4.19	0.42
40	2.33	2.54	2.45	1.18	2.19	2.14	0.55

A37. Data for %Elongation at break of CM MCC/starch films

MCC Content (wt%)	% Elongation at break						
	X_1	X_2	X_3	X_4	X_5	Mean	SD
0	60	74	32	66.92	41.53	54.89	17.59
5	3.71	5.13	5.54	10.32	4.11	5.762	2.65
10	3.45	3.45	3.23	3.48	3.24	3.37	0.12
15	2.6	2.51	2.16	1.85	2.4	2.30	0.30
20	2.22	2.13	2.21	2.15	2.16	2.17	0.04
25	2.58	1.56	2.29	2.01	2.12	0.38	0.38
30	2.4	1.78	2.44	2.03	2.11	2.15	0.27
40	2.33	2.82	1.8	1.78	1.99	2.14	0.48

A38. Data for % water absorption of HCl-BG MCC/starch films

MCC content (wt%)	Wd	W	M%
0	0.3718	1.5633	320.4700
	0.3657	1.5743	330.4900
	0.3810	1.5698	312.0200
Average			320.9933±9.25
5	0.5590	8.7469	578.4700
	0.5591	8.7433	578.3800
	0.5612	8.6541	579.2000
Average			578.35±0.44
10	0.534	4.89685	817.01
	0.5343	4.9911	834.14
	0.535	4.8856	813.2
Average			821.45±11.15
15	0.4905	5.564	1034.3500
	0.4876	5.5633	1040.9700
	0.4897	5.5471	1033.5500
Average			1036.2900±4.07
20	0.4786	6.2996	1216.2600
	0.4788	6.3224	1220.4700
	0.4932	6.3124	1179.8900
Average			1205.5400±22.31
25	0.534	7.0039	1211.5900
	0.5347	7.0045	1210.0000
	0.5331	7.0121	1212.3400
Average			1211.3100±1.19

A38. Data for % water absorption of HCl-BG MCC/starch films (continous)

MCC content (wt%)	Wd	W	M%
30	0.4690	7.7453	1251.4500
	0.4685	7.7432	1552.7600
	0.4732	7.7551	1539.9300
Average			1448.0470±170.00
40	0.6073	6.29962	1529.0300
	0.6077	6.3224	1528.7000
	0.6102	6.3124	1365.6000
Average			1205.5400±22.31

A39. Data for % water absorption of H_2SO_4-BG MCC/starch films

MCC content (wt%)	Wd	W	M%
0	0.3718	1.5633	320.4700
	0.3657	1.5743	330.4900
	0.3810	1.5698	312.0200
Average			320.9933±9.25
5	0.7075	3.46629	389.9400
	0.7100	3.4560	386.7600
	0.7085	3.4450	386.2400
Average			387.6466±2.00
10	0.3700	2.4030	549.4600
	0.3910	2.6040	565.9800
	0.3814	2.5230	561.5100
Average			558.9833±8.54
15	0.4783	3.3340	597.0500
	0.4674	4.2110	800.9400
	0.4811	3.8490	700.0400
Average			699.34333±101.94
20	0.6200	5.4131	773.0800
	0.6111	6.0000	821.6200
	0.6211	5.3110	755.1000
Average			783.2667±34.41
25	0.5754	5.6280	878.1000
	0.5944	5.5282	830.0100
	0.5854	5.4200	825.8600
Average			844.6567±29.03

A39. Data for % water absorption of H_2SO_4-BG MCC/starch films (continuous)

MCC content (wt%)	Wd	W	M%
30	0.5274	5.1000	867.0100
	0.5477	5.2200	853.0800
	0.5274	5.1887	883.8300
Average			867.9733±15.39
40	0.6240	6.7963	980.7963
	0.6260	6.8767	998.0000
	0.6330	6.6643	952.2200
Average			977.0053±23.12

A40. Data for % water absorption of HCl-BS MCC/starch films

MCC content (wt%)	Wd	W	M%
0	0.3718	1.5633	320.4700
	0.3657	1.5743	330.4900
	0.3810	1.5698	312.0200
Average			320.9933±9.25
5	0.4800	3.8762	707.5400
	0.4920	3.5137	614.1700
	0.4753	3.2111	575.5900
Average			632.4333±67.84
10	0.5160	4.9724	863.6400
	0.5004	4.8911	877.4300
	0.5211	4.9986	859.2400
Average			866.7700±9.49
15	0.5963	8.8231	985.1900
	0.5671	9.1587	986.0010
	0.6104	8.5990	985.7000
Average			985.4260±10.30
20	0.4670	5.1238	997.1730
	0.4653	5.1453	1005.8030
	0.4415	5.1344	1062.9500
Average			1021.9753±35.74
25	0.4781	6.4361	1246.1800
	0.4854	6.4376	1226.2500
	0.4830	6.2118	1186.0900
Average			1219.5067±30.60

A40. Data for % water absorption of HCl-BS MCC/starch films (continuous)

MCC content (wt%)	Wd	W	M%
30	0.5166	7.1140	1277.0800
	0.5134	7.3240	1326.5700
	0.5175	7.7620	1399.9000
Average	0.5175	7.7620	1399.9000±61.00
40	0.5374	9.5693	1680.6700
	0.5211	9.9560	1810.5600
	0.5493	8.8764	1687.8700
Average			1726.3667±73.00

A41. Data for % water absorption of H_2SO_4-BS MCC/starch films

MCC content (wt%)	Wd	W	M%
0	0.3718	1.5633	320.4700
	0.3657	1.5743	330.4900
	0.3810	1.5698	312.0200
Average			320.9933±9.25
5	0.599	3.5142	486.6778
	0.5934	3.5114	491.7425
	0.5925	3.6145	510.0040
Average			496.1414±12.26
10	0.5771	5.1238	787.8500
	0.5876	5.4473	827.0400
	0.5664	5.2346	824.1900
Average			813.0267±21.85
15	0.5925	5.4465	819.2400
	0.5899	5.6678	860.8100
	0.5911	5.4784	826.8100
Average			835.6200±22.14
20	0.4727	4.7912	913.5800
	0.4699	4.7911	919.6000
	0.4711	4.7254	903.0600
Average			912.0800±8.37
25	0.5532	5.7459	938.6700
	0.5543	5.7740	941.6700
	0.5411	5.6632	946.6100
Average			942.3167±40

A41. Data for % water absorption of H_2SO_4-BS MCC/starch films (continuous)

MCC content (wt%)	Wd	W	M%
30	0.6336	8.4957	1240.8600
	0.6321	8.4356	1234.5300
	0.6310	8.5647	1257.3220
Average			1244.2370±8.34
40	0.5771	5.1238	787.8500
	0.5876	5.4473	827.0400
	0.5664	5.2346	824.1900
Average			813.0267±21

A42. Data for % water absorption of CM-MCC/starch films

MCC content (wt%)	Wd	W	M%
0	0.3718	1.5633	320.4700
	0.3657	1.5743	330.4900
	0.3810	1.5698	312.0200
Average			320.9933±9.25
5	0.4982	3.8547	673.2500
	0.4887	3.8767	693.2600
	0.5011	3.887	675.6900
Average			680.7333±10.91
10	0.7710	9.5074	1133.1300
	0.7810	9.6120	1130.7300
	0.7600	9.4511	1143.5700
Average			1135.81±6.82
15	0.6048	8.0589	1232.4900
	0.6151	8.0432	1207.6200
	0.5978	8.0589	1248.0930
Average			1229.4010±20.41
20	0.3730	5.0569	1255.7370
	0.3830	5.0476	1217.9110
	0.3600	5.6610	1472.5000
Average			1315.383±137
25	0.8379	12.3686	1376.1400
	0.8471	13.0340	1438.6600
	0.8321	11.9780	1339.4900
Average			1384.763±50.14

A42. Data for % water absorption of CM-MCC/starch films (continuous)

MCC content (wt%)	Wd	W	M%
30	0.4996	9.0210	1705.6400
	0.5100	9.2200	1707.8400
	0.4798	8.9900	1773.7000
Average			1729.0600±38.67
40	0.4672	10.75	2200.94
	0.4577	10.5543	2205.94
	0.4532	10.4337	2202.22
Average			2203.033±2.59

A43. Data for % weight loss of HCl-BG MCC/ starch for 3 days

MCC content (wt%)	Initial weight	Final weight	% weight loss
0	0.373	0.274	26.54
	0.474	0.349	26.50
	0.364	0.277	23.90
Average			23.64
5	0.689	0.413	40.5
	0.787	0.482	38.75
	0.588	0.342	41.84
Average			40.36
10	0.653	0.367	43.80
	0.752	0.411	45.36
	0.722	0.404	44.04
Average			44.4
15	0.711	0.381	46.41
	0.742	0.393	47.04
	0.715	0.378	47.13
Average			46.86
20	0.732	0.361	50.60
	0.744	0.357	52.01
	0.753	0.360	52.19
Average			51.60
25	0.774	0.349	54.91
	0.763	0.344	54.92
	0.742	0.336	54.77
Average			54.87
30	0.667	0.268	59.82
	0.678	0.277	59.67
	0.742	0.300	59.56
Average			59.68

A44. Data for % weight loss of H_2SO_4-BG MCC/ starch for 3 days

MCC content (wt%)	Initial weight	Final weight	% weight loss
0	0.373	0.274	26.54
	0.474	0.349	26.50
	0.364	0.277	23.90
Average			23.64
5	0.617	0.425	31.11
	0.644	0.444	31.05
	0.631	0.421	33.28
Average			31.81
10	0.531	0.341	35.78
	0.556	0.497	37.94
	0.497	0.318	36.01
Average			36.58
15	0.635	0.387	39.06
	0.652	0.399	38.80
	0.562	0.350	37.72
Average			38.52
20	0.618	0.359	41.91
	0.711	0.412	42.05
	0.623	0.361	42.05
Average			38.52
25	0.513	0.289	43.66
	0.475	0.276	41.89
	0.552	0.310	43.84
Average			43.13
30	0.532	0.270	49.24
	0.612	0.306	50
	0.611	0.306	49.92
Average			49.72

A45. Data for % weight loss of HCl-BS MCC/ starch for 3 days

MCC content (wt%)	Initial weight	Final weight	% weight loss
0	0.373	0.274	26.54
	0.474	0.349	26.50
	0.364	0.277	23.90
Average			23.64
5	0.727	0.458	37
	0.741	0.467	36.98
	0.773	0.501	35.18
Average			36.39
10	0.668	0.408	38.92
	0.679	0.415	38.88
	0.667	0.406	38.86
Average			38.88
15	0.704	0.401	43.04
	0.712	0.391	45.08
	0.621	0.360	42.03
Average			43.38
20	0.712	0.391	45.08
	0.732	0.386	47.28
	0.715	0.397	44.48
Average			45.613
25	0.675	0.310	54.07
	0.714	0.330	53.78
	0.701	0.322	54.07
Average			53.96
30	0.774	0.332	57.10
	0.764	0.328	57.07
	0.777	0.333	57.14
Average			57.10

A46. Data for % weight loss of H_2SO_4-BS MCC/ starch for 3 days

MCC content (wt%)	Initial weight	Final weight	% weight loss
0	0.373	0.274	26.54
	0.474	0.349	26.50
	0.364	0.277	23.90
Average			23.64
5	0.452	0.321	28.98
	0.541	0.385	28.83
	0.531	0.380	28.43
Average			28.75
10	0.533	0.364	31.76
	0.534	0.369	30.89
	0.647	0.444	31.37
Average			31.32
15	0.562	0.365	35.05
	0.534	0.347	35.02
	0.533	0.341	36.22
Average			35.36
20	0.663	0.417	37.10
	0.534	0.340	36.32
	0.632	0.388	38.60
Average			36.02
25	0.531	0.316	41.43
	0.642	0.378	41.12
	0.663	0.392	40.875
Average			41.142
30	0.532	0.262	50.75
	0.533	0.273	48.78
	0.498	0.251	49.59
Average			49.71

A47. Data for % weight loss of CM MCC/ starch for 3 days

MCC content (wt%)	Initial weight	Final weight	% weight loss
0	0.373	0.274	26.54
	0.474	0.349	26.50
	0.364	0.277	23.90
Average			23.64
5	0.715	0.400	44.05
	0.774	0.433	44.06
	0.721	0.404	43.97
Average			43.71
10	0.531	0.292	45.01
	0.715	0.393	45.34
	0.765	0.421	44.98
Average			45.10
15	0.787	0.401	49.05
	0.742	0.378	49.05
	0.767	0.391	49.02
Average			49.04
20	0.776	0.356	54.12
	0.742	0.340	54.18
	0.735	0.338	54.01
Average			54.10
25	0.756	0.325	57.01
	0.764	0.328	57.07
	0.744	0.310	56.98
Average			57.02
30	0.765	0.283	63.00
	0.833	0.308	61.82
	0.749	0.277	63.02
Average			62.61

A48. Data for % weight loss of HCl-BG MCC/ starch for 6 days

MCC content (wt%)	Initial weight	Final weight	% weight loss
0	0.443	0.302	31.82
	0.364	0.244	32.97
	0.414	0.272	34.30
Average			33.03
5	0.689	0.323	53.12
	0.674	0.316	53.11
	0.677	0.318	53.02
Average			53.08
10	0.653	0.293	55.13
	0.714	0.293	58.96
	0.715	0.321	55.10
Average			56.40
15	0.732	0.307	58.06
	0.741	0.311	58.03
	0.741	0.311	58.03
Average			58.04
20	0.712	0.256	64.04
	0.764	0.275	64.00
	0.731	0.263	64.02
Average			64.02
25	0.712	0.256	64.04
	0.764	0.275	64.00
	0.731	0.263	64.02
Average			64.02
30	0.665	0.156	76.54
	0.664	0.156	76.51
	0.713	0.171	76.02
Average			76.35

A49. Data for % weight loss of H_2SO_4-BG MCC/ starch for 6 days

MCC content (wt%)	Initial weight	Final weight	% weight loss
0	0.443	0.302	31.82
	0.364	0.244	32.97
	0.414	0.272	34.30
Average			33.03
5	0.617	0.400	45.00
	0.633	0.348	45.02
	0.646	0.355	45.05
Average			45.04
10	0.543	0.29	46.59
	0.642	0.346	46.11
	0.644	0.345	46.43
Average			46.37
15	0.652	0.297	54.44
	0.644	0.293	54.50
	0.743	0.330	55.56
Average			54.83
20	0.544	0.233	57.17
	0.565	0.242	57.67
	0.642	0.276	57.01
Average			57.11
25	0.532	0.21	60.15
	0.611	0.24	60.06
	0.642	0.27	60
Average			60.25
30	0.661	0.242	68.38
	0.662	0.196	68.48
	0.631	0.151	68.26
Average			68.37

A50. Data for % weight loss of HCl-BS MCC/ starch for 6 days

MCC content (wt%)	Initial weight	Final weight	% weight loss
0	0.443	0.302	31.82
	0.364	0.244	32.97
	0.414	0.272	34.30
Average			33.03
5	0.727	0.378	48.00
	0.742	0.385	48.11
	0.643	0.330	48.67
Average			48.26
10	0.668	0.310	54.94
	0.674	0.323	52.08
	0.675	0.314	53.48
Average			53.49
15	0.714	0.299	58.12
	0.704	0.295	58.10
	0.777	0.326	58.04
Average			58.08
20	0.675	0.249	63.11
	0.677	0.250	63.072
	0.674	0.249	62.96
Average			63.04
25	0.647	0.221	65.84
	0.695	0.231	66.76
	0.713	0.243	65.91
Average			66.17
30	0.675	0.231	65.77
	0.674	0.230	65.87
	0.774	0.264	65.89
Average			65.84

A51. Data for % weight loss of H_2SO_4-BS MCC/ starch for 6 days

MCC content (wt%)	Initial weight	Final weight	% weight loss
0	0.443	0.302	31.82
	0.364	0.244	32.97
	0.414	0.272	34.30
Average			33.03
5	0.629	0.415	34.02
	0.617	0.407	34.04
	0.545	0.359	34.13
Average			34.06
10	0.614	0.381	37.95
	0.663	0.412	37.86
	0.642	0.398	38.00
Average			37.93
15	0.652	0.365	44.01
	0.674	0.377	44.07
	0.531	0.297	44.67
Average			44.24
20	0.617	0.333	46.515
	0.534	0.288	46.07
	0.634	0.342	46.06
Average			46.215
25	0.532	0.281	47.18
	0.614	0.325	47.07
	0.615	0.325	47.54
Average			47.26
30	0.668	0.280	58.08
	0.619	0.260	57.99
	0.614	0.257	58.14
Average			58.07

A52. Data for % weight loss of CM MCC/ starch for 6 days

MCC content (wt%)	Initial weight	Final weight	% weight loss
0	0.443	0.302	31.82
	0.364	0.244	32.97
	0.414	0.272	34.30
Average			33.03
5	0.715	0.307	57.06
	0.714	0.307	57.00
	0..721	0.310	57.04
Average			57.03
10	0.765	0.313	59.08
	0.787	0.322	59.08
	0.776	0.318	59.02
Average			59.06
15	0.776	0.271	65.07
	0.765	0.279	63.09
	0.776	0.283	63.06
Average			63.74
20	0.776	0.248	68.04
	0.756	0.242	68.25
	0.765	0.248	66.93
Average			67.73
25	0.756	0.196	74.07
	0.756	0.196	74.07
	0.747	0.194	74.02
Average			74.05
30	0.764	0.160	79.05
	0.742	0.155	79.11
	0.744	0.156	79.03
Average			79.06

A53. Data for % weight loss of HCl-BG MCC/ starch for 9 days

MCC content (wt%)	Initial weight	Final weight	% weight loss
0	0.453	0.292	31.82
	0.447	0.290	32.97
	0.543	0.350	34.30
Average			33.03
5	0.744	0.340	54.30
	0.732	0.322	56.01
	0.751	0.330	56.06
			55.45
10	0.680	0.260	61.76
	0.761	0.291	61.67
	0.743	0.284	61.78
15	0.665	0.238	64.21
	0.742	0.266	64.14
	0.747	0.268	64.12
			64.17

A54. Data for % weight loss of H_2SO_4-BG MCC/ starch for 9 days

MCC content (wt%)	Initial weight	Final weight	% weight loss
0	0.453	0.292	31.82
	0.447	0.290	32.97
	0.543	0.350	34.30
Average			33.03
5	0.631	0.303	51.98
	0.591	0.283	52.11
	0.611	0.293	52.05
Average			54.05
10			
	0.643	0.283	55.98
	0.574	0.253	55.92
	0.622	0.274	55.90
Average			55.95
15	0.513	0.210	59.06
	0.624	0.256	58.97
	0.633	0.259	59.08
Average			59.04
20	0.532	0.213	59.96
	0.671	0.280	58.27
	0.644	0.256	60.23
Average			59.49

A55. Data for % weight loss of HCl-BS MCC/ starch for 9 days

MCC content (wt%)	Initial weight	Final weight	% weight loss
0	0.453	0.292	31.82
	0.447	0.290	32.97
	0.543	0.350	34.30
Average			33.03
5	0.673	0.296	56.01
	0.691	0.304	56.00
	0.673	0.296	56.07
Average			56.01
10	0.743	0.304	59.08
	0.706	0.289	59.07
	0.713	0.290	59.32
Average			59.16
15	0.719	0.263	63.42
	0.79	0.250	63.18
	0.743	0.272	63.11
Average			63.30

A56. Data for % weight loss of H_2SO_4-BG MCC/ starch for 9 days

MCC content (wt%)	Initial weight	Final weight	% weight loss
0	0.453	0.292	31.82
	0.447	0.290	32.97
	0.543	0.350	34.30
Average			33.03
5	0.629	0.415	34.02
	0.617	0.407	34.04
	0.545	0.359	34.13
Average			34.06
10	0.436	0.245	43.81
	0.455	0.257	43.60
	0.613	0.346	43.55
Average			43.65
15	0.644	0.313	51.55
	0.611	0.297	51.39
	0.673	0.330	50.96
Average			51.3
20	0.581	0.244	58.00
	0.561	0.234	58.29
	0.501	0.200	60.07
Average			58.78
25	0.544	0.213	60.85
	0.479	0.197	58.87
	0.641	0.249	61.15
Average			60.29

A57. Data for % weight loss of CM MCC/ starch for 9 days

MCC content (wt%)	Initial weight	Final weight	% weight loss
0	0.453	0.292	31.82
	0.447	0.290	32.97
	0.543	0.350	34.30
Average			33.03
5	0.531	0.217	59.13
	0.642	0.263	59.03
	0.639	0.261	59.15
Average			59.10
10	0.787	0.283	64.04
	0.776	0.279	64.05
	0.756	0.272	64.02
Average			64.04

A58. Data for % weight loss of HCl-BG MCC/ starch for 16 days

MCC content (wt%)	Initial weight	Final weight	% weight loss
0	0.434	0.241	44.47
	0.536	0.240	55.22
	0.555	0.246	54.77
Average			51.46
5	0.756	0.249	67.06
	0.718	0.236	67.13
	0.723	0.238	67.08
Average			67.09
10	0.789	0.239	69.71
	0.764	0.232	69.63
	0.745	0.226	69.66
Average			69.56

A59. Data for % weight loss of H_2SO_4-BG MCC/ starch for 16 days

MCC content (wt%)	Initial weight	Final weight	% weight loss
0	0.434	0.241	44.47
	0.536	0.240	55.22
	0.555	0.246	54.77
Average			51.46
5	0.617	0.278	54.94
	0.531	0.239	54.99
	0.642	0.289	54.98
Average			54.97
10	0.652	0.261	59.97
	0.673	0.404	59.98
	0.642	0.257	59.96
Average			59.97

A60. Data for % weight loss of HCl-BS MCC/ starch for 16 days

MCC content (wt%)	Initial weight	Final weight	% weight loss
0	0.434	0.241	44.47
	0.536	0.240	55.22
	0.555	0.246	54.77
Average			51.46
5	0.668	0.261	60.92
	0.643	0.247	61.58
	0.674	0.259	61.57
Average			61.36
10	0.643	0.216	66.41
	0.675	0.220	67.40
	0.714	0.240	66.38
Average			66.73

A61. Data for % weight loss of H_2SO_4-BS MCC/ starch for 16 days

MCC content (wt%)	Initial weight	Final weight	% weight loss
0	0.434	0.241	44.47
	0.536	0.240	55.22
	0.555	0.246	54.77
Average			51.46
5	0.618	0.290	53.07
	0.531	0.250	52.92
	0.647	0.304	53.03
Average			53.01
10	0.508	0.210	58.66
	0.544	0.223	59.00
	0.671	0.275	59.02
Average			58.90

BIOGRAPHY

Miss Voravadee Suchaiya was born on July 31, 1983 in Srisaket, Thailand. She received her bachelor's degree in chemistry from Faculty of Science, Ubonrachatanee University in March 2005. She continued her graduate study for Master of Science in Applied Polymer Science and Textile Technology at Chulalongkorn University in June 2005 and completed the program in October 2008.