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APPENDIX

A.1 shear viscosity

The apparent shear viscosity of polymer and their blends detected from the capillary rheometer at 290 °C are presented in the tables as follow:

Table A-1 Comparison of shear viscosity of pure polymer.

shear rate	PCM7	PCM10	PCM12	Bayer
1800	322.9	162.4	248.9	172.2
2400	270.7	145	219.8	142.5
3000	236.4	133.4	193.7	135.8
3600	203.4	121.8	162.3	116.9
4800	174.3	102.1	147.2	109.8
6000	146.8	93.21	125.8	106.5
8400	104	83.5	100.3	103.6

Table A-2 Viscosities of the blends of Bayer+CBC33.

shear rate	Bayer pure	0.25%	0.5%	1%
1800	172.2	101.2	73.14	60.12
2400	142.5	98.5	64.71	55.57
3000	135.8	88.34	58.96	50.36
3600	116.9	79.44	55.96	46.85
4800	109.8	70.04	51.39	39.29
6000	106.5	65.86	45.35	37.87
8400	103.6	50.3	40.37	30.4

Table A-3 Viscosities of the blends of Bayer+CBC53.

shear rate	Bayer pure	0.25%	0.5%	1%
1800	172.2	93.5	73.22	39.24
2400	142.5	88	67.14	37.53
3000	135.8	75.56	60.14	36.35
3600	116.9	68.75	56.17	33.75
4800	109.8	65.6	48.56	32.53
6000	106.5	60.03	42.9	31.08
8400	103.6	55.96	39	27.26

Table A-4 Viscosities of the blends of PCM12+CBC33.

shear rate	PCM12 pure	0.25%	0.5%	1%
1800	248.9	68.8	51.22	35.07
2400	219.8	60.58	40.57	32.23
3000	193.7	58.1	32.78	28.46
3600	162.3	49.49	29.13	23.69
4800	147.2	44.49	26.04	19.22
6000	125.8	42.93	25.47	17.66
8400	100.3	39.08	20.76	16.72

Table A-5 Viscosities of the blends of PCM12+CBC53.

shear rate	PCM12 pure	0.25%	0.5%	1%
1800	248.9	61.46	48.21	28.4
2400	219.8	54.55	41.24	25.57
3000	193.7	51.26	35.98	22.03
3600	162.3	47.66	32.76	19.73
4800	147.2	44.46	31.1	16.52
6000	125.8	40.23	26.99	14.12
8400	100.3	36.35	24.81	13.33

Table A-6 Viscosities of the blends of PCM10+CBC33.

shear rate	PCM10 pure	0.25%	0.5%	1%
1800	162.4	43.35	35.46	28.35
2400	145	41.68	33.63	27.82
3000	133.4	38.87	33.41	26.13
3600	121.8	36.67	32.28	25.79
4800	102.1	35.18	31.47	22.84
6000	93.21	34.33	30.4	20.91
8400	83.5	29.26	28.27	19.07

Table A-7 Blend of PCM10+CBC53.

shear rate	PCM10 pure	0.25%	0.5%	1%
1800	162.4	53.21	35.97	26.64
2400	145	51.34	32.2	22.21
3000	133.4	50.35	29.88	19.9
3600	121.8	44.54	25.41	15.41
4800	102.1	43.79	25.23	13.62
6000	93.21	42.3	23.26	11.33
8400	83.5	34.87	23.14	9.12

Table A-8 Viscosities of the blends of PCM7+CBC33.

shear rate	PCM7 pure	0.25%	0.5%	1%
1800	322.9	112.64	62.71	33.1
2400	270.7	102.85	53.61	30.22
3000	236.4	92.78	47.47	27.29
3600	203.4	83.19	38.06	24.3
4800	174.3	69.04	31.42	20.3
6000	146.8	52.85	27.74	16.86
8400	104	41.01	29.84	14.24

Table A-9 Viscosities of the blends of PCM7+CBC53.

shear rate	PCM7 pure	0.25%	0.5%	1%
1800	322.9	82.21	62.78	30.53
2400	270.7	65.13	55.57	27.43
3000	236.4	60.84	48.09	23.78
3600	203.4	50.13	41.95	21.44
4800	174.3	42.1	34.76	16.22
6000	146.8	33.12	19.64	13.83
8400	104	27.25	16.24	11.05

Table A-10 Comparison of the blends of Bayer and LC at 0.5% composition.

shear rate	Bayer pure	CBC33	CBC53	HP35	HP5N
1800	172.2	73.14	73.22	170.5	168.6
2400	142.5	64.71	67.14	139.8	139.9
3000	135.8	58.96	60.14	124.4	123.5
3600	116.9	55.96	56.17	115	114.8
4800	109.8	51.39	48.56	109.7	105
6000	106.5	45.35	42.9	104.2	101
8400	103.6	40.37	39	99.2	98.8

A.2 Viscosity average molecular weights

Table A-11 Viscosity average molecular weights of polycarbonates.

Material	Dissolve			melt		
	1	2	Average	1	2	average
Bayer pure	19500	19147	19324	-	-	-
+CBC33	21187	21241	21214	21331	21096	21214
+CBC53	21658	22030	21844	19996	23248	21622
PCM12 pure	21779	23951	22865	-	-	-
+CBC33	22831	23527	23179	22967	23280	23124
+CBC53	22133	21994	22064	22549	23248	22899
PCM10 pure	25018	25427	25223	-	-	-
+CBC33	25955	25807	25881	23174	22829	23002
+CBC53	23117	21718	22418	22828	22106	22467
PCM7 pure	25974	26443	26209	-	-	-
+CBC33	26980	27205	27093	24810	25807	25309
+CBC53	26980	27659	27320	25495	24361	24928

5.3 Tensile properties

Table A-12 Tensile properties of pure Bayer.

Property	Extension at break	Work done	Modulus of Elasticity	Tensile strength	Strength at break
1	4.866	377.4	422.5	41.88	40.55
2	4.421	317.9	337.4	37.02	37.02
3	5.877	536.6	313.3	39.39	38.14
4	4.474	359.7	323.4	40.02	40.02
5	4.365	415.7	350.8	39.80	39.04
6	5.389	546.6	345.9	44.35	40.32
7	4.408	404.9	285.8	37.89	37.88
8	5.472	552.2	365.5	43.92	43.86
9	4.223	299.9	361.1	34.10	34.10
10	4.865	486.1	323.6	41.93	41.93
mean	4.836	429.7	342.9	40.03	39.29
median	4.667	410.3	341.6	39.91	39.53
S.D.	0.565	94.91	36.77	3.162	2.718

Table A-13 Tensile properties of Bayer+CBC33 at 0.25 %CBC33.

Property	Extension at break	Work done	Modulus of Elasticity	Tensile strength	Strength at break
1	4.445	517	379	40.83	38.46
2	4.604	387.7	326.5	37.23	35.47
3	4.568	382.5	327.6	38.40	35.70
4	4.190	350.0	414.1	40.35	37.49
5	5.037	492.7	309.9	38.92	34.98
6	4.228	339.9	372.1	39.79	38.79
7	4.167	376.6	409.7	40.26	39.42
8	4.696	516.4	340	42.10	40.39
9	4.699	457.5	359.8	42.52	42.52
10	5.103	562.8	326.3	40.51	37.71
mean	4.574	438.3	356.5	39.99	38.09
median	4.586	422.6	349.9	40.31	38.08
S.D.	0.329	80.33	36.51	1.659	2.358

Table A-14 Tensile properties of Bayer+CBC33 at 0.5 %CBC33.

Property	Extension at break	Work done	Modulus of Elasticity	Tensile strength	Strength at break
1	3.626	217.9	456.2	36.94	36.94
2	3.515	208.4	450.1	35.10	35.10
3	3.661	263.9	417.5	37.61	37.61
4	4.528	373.7	365.5	40.40	40.40
5	4.631	405.3	313.2	40.60	40.61
6	5.013	500.3	360.3	43.22	43.22
7	4.845	338.4	399.6	40.37	40.37
8	5.178	367.4	366.1	39.28	39.28
9	5.242	393.2	381.7	43.39	43.14
10	5.268	439.9	369.7	36.57	35.42
mean	4.551	350.8	387.9	39.35	39.21
median	4.738	370.5	375.7	39.82	39.83
S.D.	0.700	95.16	43.76	2.78	2.891

Table A-15 Tensile properties of Bayer+CBC53 0.25 %CBC53.

Property	Extension at break	Work done	Modulus of Elasticity	Tensile strength	Strength at break
1	3.897	300.3	463.3	41.14	41.14
2	4.558	361.2	391.2	43.00	43.00
3	4.499	456.3	318.9	40.32	37.11
4	4.022	262.4	482.1	39.48	39.47
5	4.547	350.4	384.3	36.66	35.73
6	3.981	367.1	369.5	38.93	38.93
7	3.175	227.4	419.3	36.29	36.29
8	4.062	434.8	380.8	37.52	33.77
9	4.517	467.1	412.3	43.03	37.89
10	4.305	408.9	411.9	43.16	41.18
mean	4.156	363.6	403.4	39.95	38.45
median	4.183	364.1	401.5	39.89	38.41
S.D.	0.431	81.25	46.55	2.626	2.842

Table A-16 Tensile properties of Bayer+CBC53 at 0.5 %CBC53.

Property	Extension at break	Work done	Modulus of Elasticity	Tensile strength	Strength at break
1	3.507	270.5	395.0	34.17	34.17
2	4.074	274.2	465.7	43.13	40.49
3	4.826	321.5	419.6	40.15	40.15
4	3.939	291.8	463.5	40.28	40.21
5	5.045	380.0	395.6	40.73	40.00
6	5.038	391.2	380.1	40.07	40.02
7	4.170	287.5	437.9	40.12	40.12
8	4.278	344.7	422.6	39.93	39.28
9	3.619	261.5	420.2	35.14	35.14
10	4.296	414.0	411.6	40.24	38.58
mean	4.263	323.7	421.2	39.40	38.81
median	4.224	306.7	419.9	40.13	40.01
S.D.	0.547	55.58	28.24	2.676	2.271

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