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APPENDICES

Appendix A Scanning Electron Microscopy Analysis

Table A1 Number average particle size (d_n) of dispersed phase of uncompatibilized Ny6/LDPE blends.

Ny6/LDPE blends ratio (%wt) without Na-EMAA	20/80	40/60	50/50	60/40	80/20
Mean	15.7955	26.1030	24.7646	13.0115	17.3175
Std. Error of Mean	1.4675	1.6261	1.4585	1.3981	0.7409
Std. Deviation	13.1254	14.5444	13.0448	12.5050	6.6268
Range	10.05	66.95	64.11	60.32	31.02
Minimum	3.15	3.85	2.59	1.88	2.08
Maximum	13.20	70.80	66.70	62.20	33.10

Table A2 Number average particle size (d_n) of dispersed phase of Ny6/LDPE blends with 0.5 phr of Na-EMAA compatibilized.

Ny6/LDPE blends ratio (%wt) with 0.5 phr Na-EMAA	20/80	40/60	50/50	60/40	80/20
Mean	2.6239	3.8926	5.9578	2.1433	2.4968
Std. Error of Mean	0.1437	0.3671	0.4217	0.1161	0.0644
Std. Deviation	1.2849	3.2837	3.7717	1.0385	0.5757
Range	6.02	22.64	16.43	5.39	2.47
Minimum	0.61	0.66	1.07	0.77	1.26
Maximum	6.63	23.30	17.50	6.16	3.73

Table A3 Number average particle size (d_n) of dispersed phase of Ny6/LDPE blends with 1.5 phr of Na-EMAA compatibilized.

Ny6/LDPE blends ratio (%wt) with 1.5 phr Na-EMAA	20/80	40/60	50/50	60/40	80/20
Mean	1.7338	2.4757	2.6549	2.2737	1.7484
Std. Error of Mean	0.1263	0.1326	0.1295	0.1822	0.1144
Std. Deviation	1.1300	1.1863	1.1580	1.6298	1.0235
Range	5.83	6.14	5.19	7.87	4.08
Minimum	0.28	0.70	0.78	0.69	0.37
Maximum	6.10	6.84	5.97	8.56	4.45

Table A4 Number average particle size (d_n) of dispersed phase of Ny6/LDPE blends with 5.0 phr of Na-EMAA compatibilized.

Ny6/LDPE blends ratio (%wt) with 5.0 phr Na-EMAA	20/80	40/60	50/50	60/40	80/20
Mean	2.5866	1.9814	2.7639	1.4239	1.6760
Std. Error of Mean	0.1248	0.1259	0.1376	0.1307	0.0877
Std. Deviation	1.1159	1.1258	1.2306	1.1688	0.7844
Range	5.30	5.20	5.81	9.98	3.45
Minimum	0.64	0.57	1.05	0.33	0.46
Maximum	5.94	5.77	6.86	10.30	3.90

Table A5 Number average particle size (d_n) of dispersed phase of Ny6/Na-EMAA blends.

Ny6/Na-EMAA blends ratio (%wt)	20/80	40/60	50/50	60/40	80/20
Mean	1.5626	2.2032	1.9264	1.8691	0.8384
Std. Error of Mean	0.0555	0.1630	0.2071	0.1113	0.0348
Std. Deviation	0.4960	1.4582	1.8520	0.9957	0.3115
Range	2.14	9.04	10.22	4.70	1.81
Minimum	0.52	0.46	0.18	0.40	0.21
Maximum	2.66	9.50	10.40	5.10	2.01

Appendix B Thermogravimetric Analysis

Table B1 Degradation temperature (at 10%weight loss), pre-exponential factor (lnA), and activation energy (E_a) at 0.1 conversion of pure components.

Pure component		Ny6	LDPE	Na-EMAA
Heating rate (°C/min)	10	390.4	318.1	361.2
	20	398.3	339.4	393.5
	40	418.8	352.2	406.6
Temperature at 0.1 (°C)		380.2	311.8	354.6
E_a (kJ/mol)		175.7	122.0	102.5
ln A (min^{-1})		34.3	27.1	21.7
r^2		0.9424	0.9749	0.9373

Table B2 Degradation temperature (at 10% weight loss), pre-exponential factor (lnA), and activation energy (E_a) at 0.1 conversion of uncompatibilized Ny6/LDPE blends.

Ny6/LDPE blend ratio		20/80	40/60	50/50	60/40	80/20
Heating rate (°C/min)	10	284.5	313.2	315.6	359.1	368.2
	20	339.1	330.0	340.6	367.2	393.6
	40	365.2	370.9	368.0	379.9	410.6
Temperature at 0.1 (°C)		271.5	292.7	301.9	318.9	359.7
E_a (kJ/mol)		48.1	71.9	83.0	70.1	117.1
ln A (min^{-1})		12.6	17.2	19.3	16.2	24.2
r^2		0.9467	0.9544	1.0000	0.7973	0.9820

Table B3 Degradation temperature (at 10% weight loss), pre-exponential factor (lnA), and activation energy (E_a) at 0.1 conversion of Ny6/LDPE blends with 0.5 phr of Na-EMAA.

Ny6/LDPE blend ratio		20/80	40/60	50/50	60/40	80/20
Heating rate (°C/min)	10	345.0	357.4	364.3	365.7	400.2
	20	361.8	369.1	367.4	368.2	418.6
	40	367.4	372.1	376.3	383.5	427.5
Temperature at 0.1 (°C)		342.2	355.9	359.9	358.1	395.7
E_a(kJ/mol)		186.8	285.4	370.3	232.0	190.6
ln A (min^{-1})		38.6	56.7	72.3	46.2	36.3
r^2		0.9182	0.8945	0.9306	0.8559	0.9585

Table B4 Degradation temperature (at 10% weight loss), pre-exponential factor (lnA), and activation energy (E_a) at 0.1 conversion of Ny6/LDPE blends with 1.5 phr of Na-EMAA.

Ny6/LDPE blend ratio		20/80	40/60	50/50	60/40	80/20
Heating rate (°C/min)	10	342.7	386.9	381.7	366.2	397.3
	20	363.7	393.6	387.0	373.9	419.3
	40	375.2	397.3	392.8	375.8	426.9
Temperature at 0.1 (°C)		336.9	385.0	378.7	365.3	393.5
E_a(kJ/mol)		136.9	476.0	451.1	444.4	168.1
ln A (min^{-1})		29.0	89.0	85.2	85.9	32.4
r^2		0.9680	0.9710	0.9995	0.8921	0.9213

Table B5 Degradation temperature (at 10% weight loss), pre-exponential factor (lnA), and activation energy (E_a) at 0.1 conversion of Ny6/LDPE blends with 5.0 phr of Na-EMAA.

Ny6/LDPE blend ratio		20/80	40/60	50/50	60/40	80/20
Heating rate (°C/min)	10	357.4	353.0	366.3	360.5	397.1
	20	364.4	359.6	373.4	365.4	424.1
	40	368.1	367.3	386.0	378.2	427.4
Temperature at 0.1 (°C)		355.6	349.2	360.0	354.1	395.5
E_a(kJ/mol)		420.0	322.5	241.0	252.2	148.1
ln A (min^{-1})		82.4	64.3	47.7	50.3	28.8
r^2		0.9648	0.9987	0.9766	0.9399	0.8290

Table B6 Degradation temperature (at 10% weight loss), pre-exponential factor (lnA), and activation energy (E_a) at 0.1 conversion of Ny6/Na-EMAA blends.

Ny6/Na-EMAA blend ratio		20/80	40/60	50/50	60/40	80/20
Heating rate (°C/min)	10	398.7	395.9	394.6	395.0	395.0
	20	412.2	416.8	419.2	423.4	419.5
	40	430.5	434.7	425.4	436.1	432.5
Temperature at 0.1 (°C)		389.5	386.9	391.5	388.6	388.5
E_a (kJ/mol)		170.2	139.8	155.0	125.9	139.4
ln A (min^{-1})		32.8	27.4	30.2	24.9	27.4
r^2		0.9942	0.9964	0.8874	0.9479	0.9647

Table B7 Degradation temperature (at 10% weight loss), pre-exponential factor (lnA), and activation energy (E_a) at 0.1 conversion of LDPE/Na-EMAA blends.

LDPE/Na-EMAA blend ratio		20/80	40/60	50/50	60/40	80/20
Heating rate (°C/min)	10	372.9	363.7	356.4	348.2	342.0
	20	395.2	375.7	367.6	362.0	353.2
	40	403.0	381.8	375.5	367.0	365.9
Temperature at 0.1 (°C)		369.0	360.6	352.5	345.7	335.7
E_a (kJ/mol)		154.4	255.0	243.5	226.8	189.8
ln A (min^{-1})		31.0	50.4	48.8	46.2	39.4
r^2		0.9229	0.9634	0.9878	0.9295	0.9994

Appendix C Fourier Transform Infrared Spectrometry

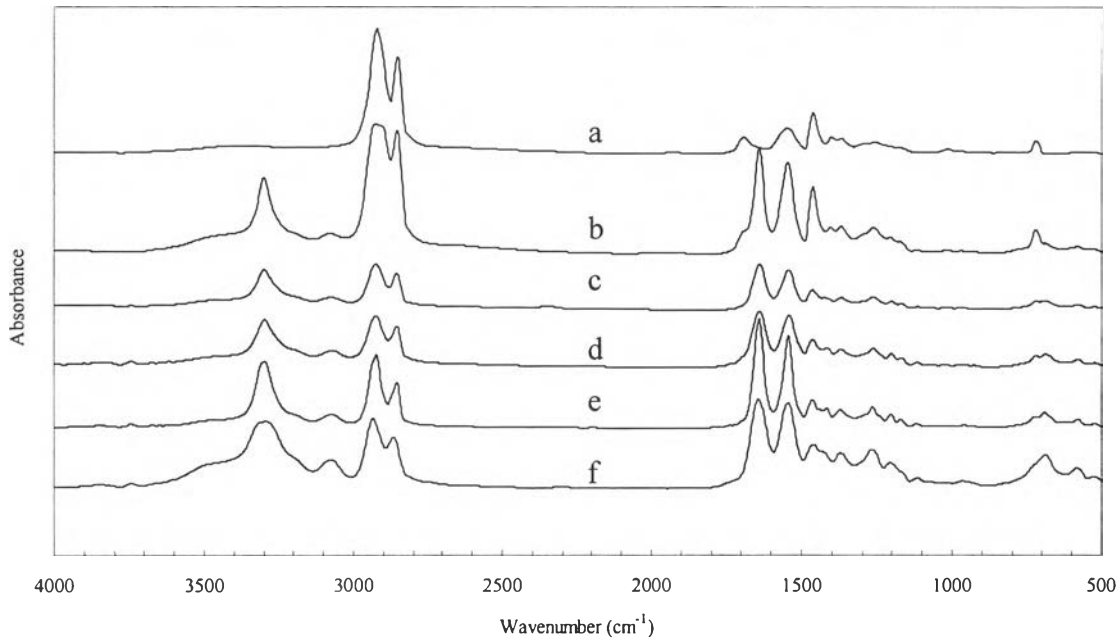

Figure C1 FTIR spectra of Ny6/Na-EMAA binary blends: (a) pure Na-EMAA, (b) 20/80, (c) 50/50, (d) 60/40, (e) 80/20, (f) pure Ny6.

Table C1 Assignments of FT-IR absorption bands for Ny6/Na-EMAA binary blends.

Wavenumber (cm^{-1})	Characteristic group
3300	N-H stretching
2940	Asymmetric and symmetric stretching of CH_2
2850	Symmetric stretching of CH_2
1695	Hydrogen bond carbonyl stretching
1550	Antisymmetric stretching mode of the carboxylate groups present in the ion cluster
1540	N-H bending
720	CH_2 bending

Appendix D X-ray Diffraction Analysis

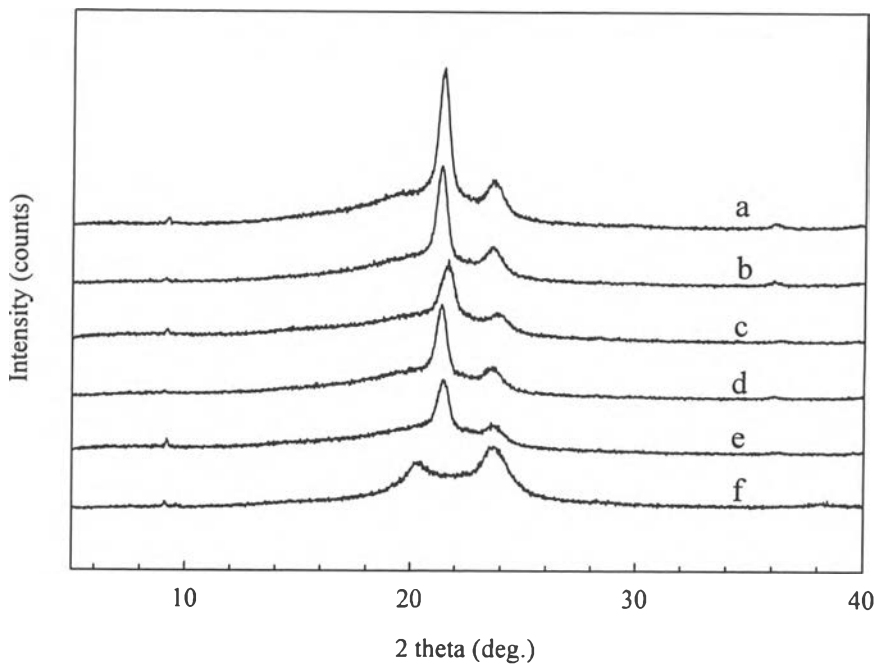

Figure D1 WAXS patterns of 20/80 Ny6/LDPE blends: (a) LDPE, (b) 5.0 phr, (c) 1.5 phr, (d) 0.5 phr, (e) 0 phr of Na-EMAA, (f) Ny6.

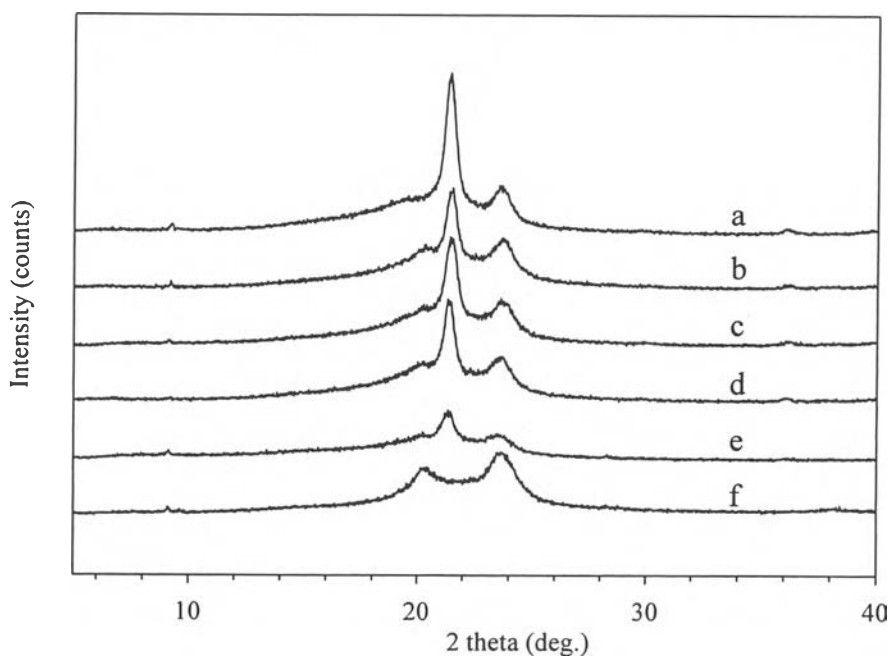

Figure D2 WAXS patterns of 40/60 Ny6/LDPE blends: (a) LDPE, (b) 5.0 phr, (c) 1.5 phr, (d) 0.5 phr , (e) 0 phr of Na-EMAA, (f) Ny6.

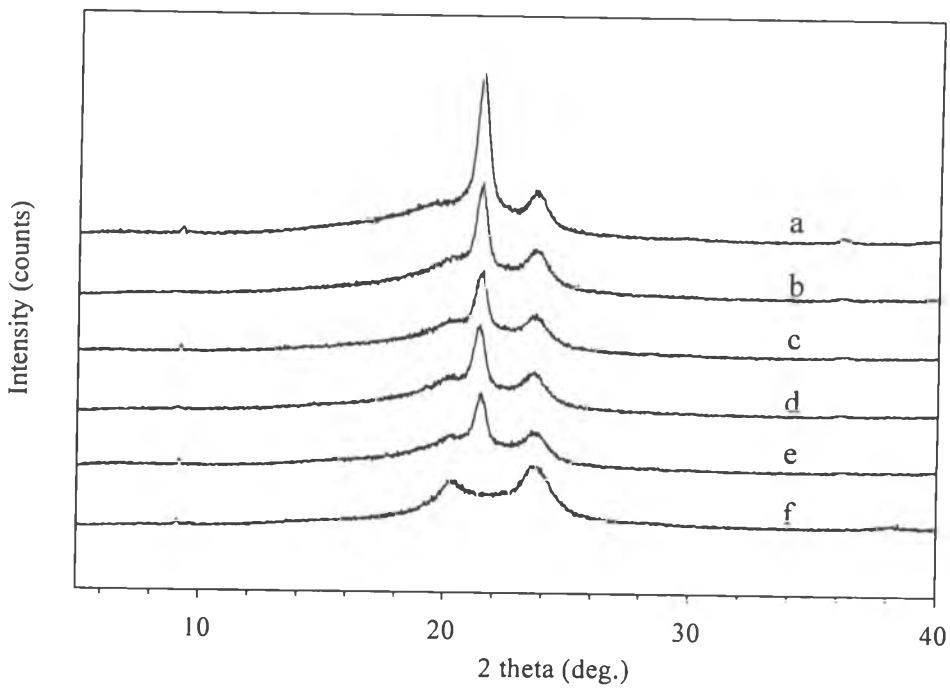

Figure D3 WAXS patterns of 50/50 Ny6/LDPE blends: (a) LDPE, (b) 5.0 phr, (c) 1.5 phr, (d) 0.5 phr , (e) 0 phr of Na-EMAA, (f) Ny6.

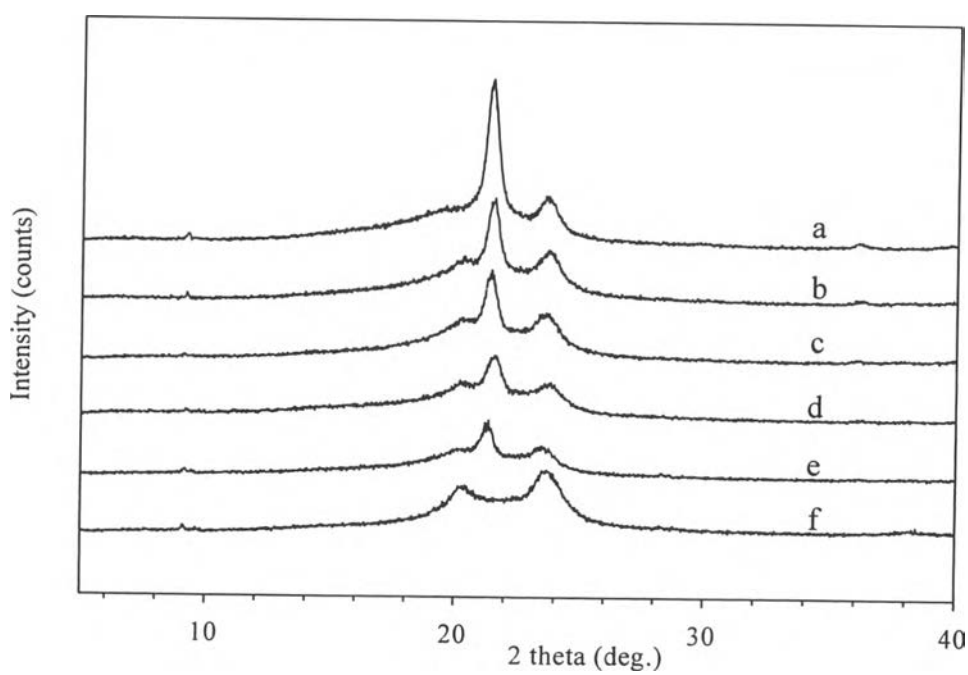

Figure D4 WAXS patterns of 60/40 Ny6/LDPE blends: (a) LDPE, (b) 5.0 phr, (c) 1.5 phr, (d) 0.5 phr , (e) 0 phr of Na-EMAA, (f) Ny6.

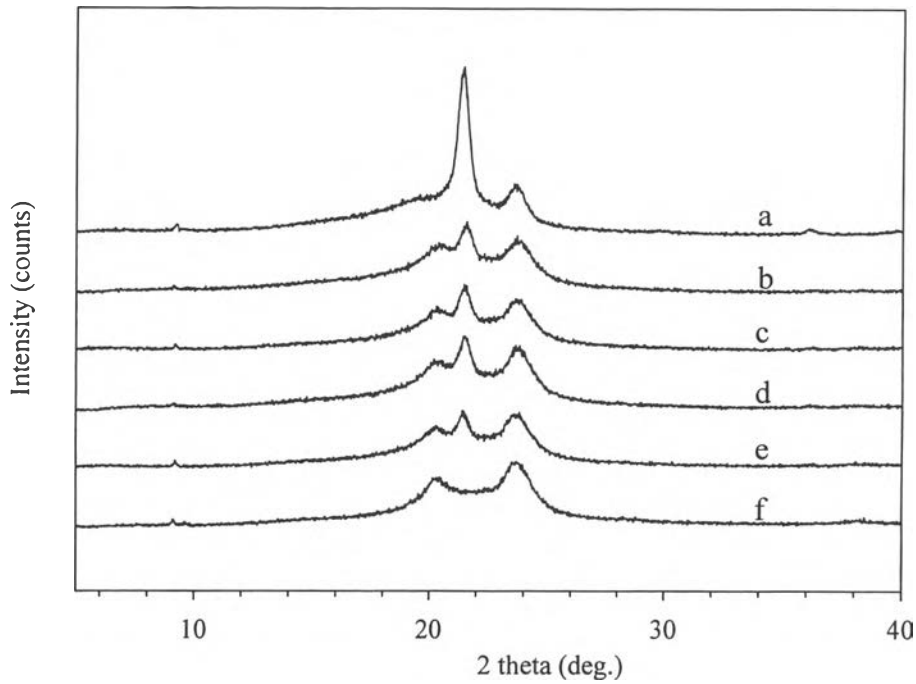

Figure D5 WAXS patterns of 80/20 Ny6/LDPE blends: (a) LDPE, (b) 5.0 phr, (c) 1.5 phr, (d) 0.5 phr, (e) 0 phr of Na-EMAA, (f) Ny6.

Appendix E Differential Scanning Calorimetric Analysis

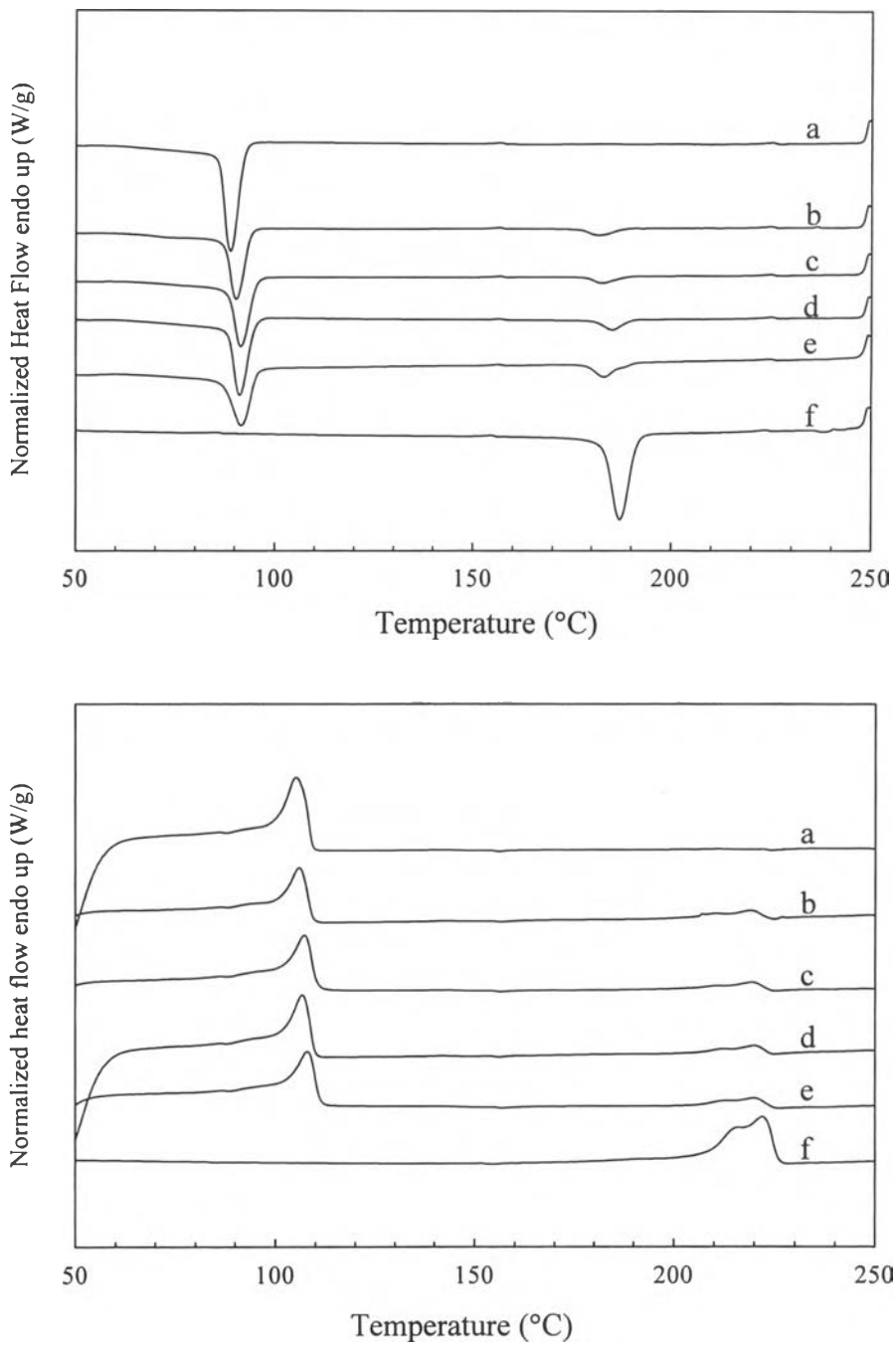

Figure E1 DSC thermograms of 20/80 Ny6/LDPE blends: (a) LDPE, (b) 5.0 phr, (c) 1.5 phr, (d) 0.5 phr, (e) 0 phr of Na-EMAA, (f) Ny6.

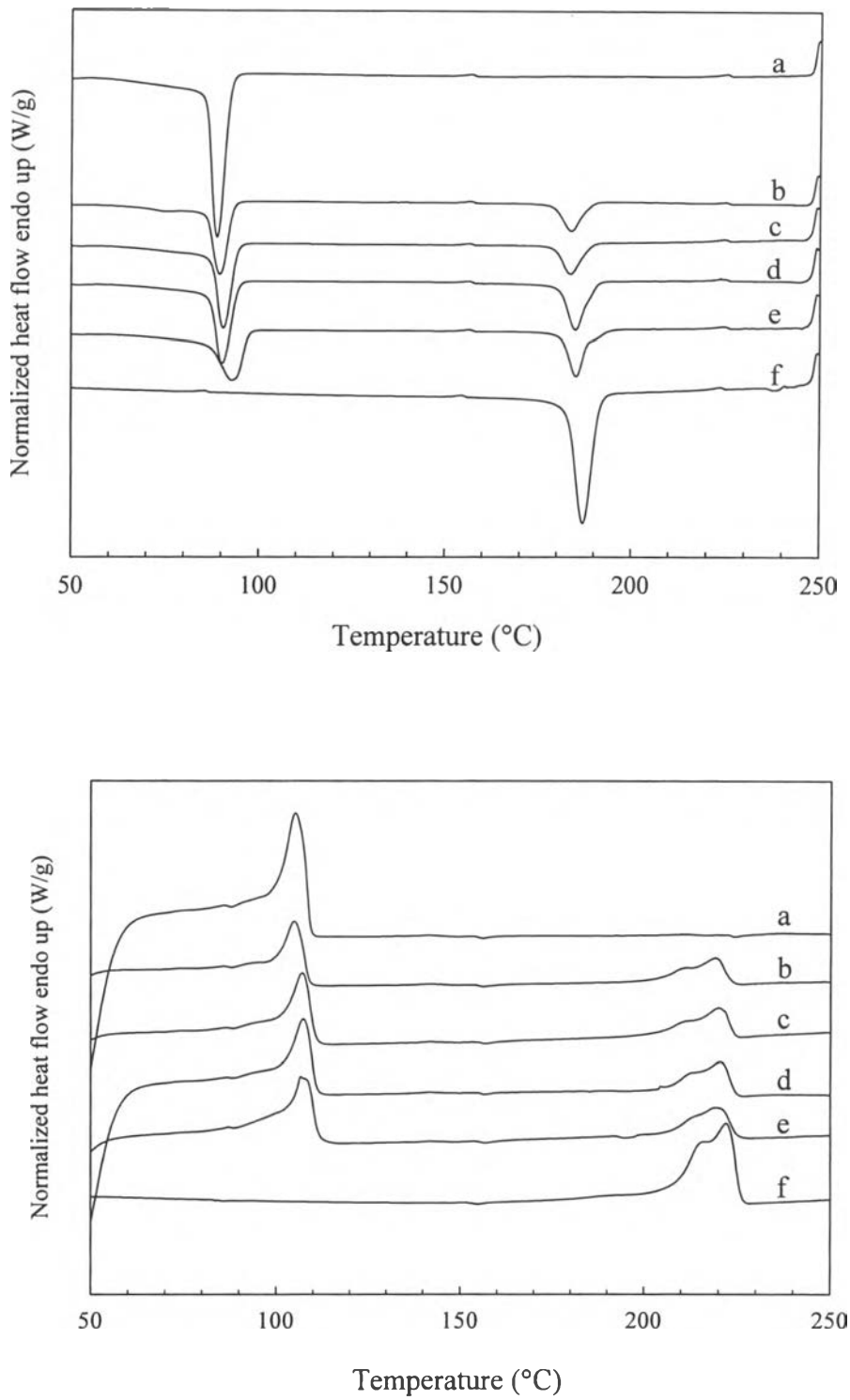

Figure E2 DSC thermograms of 40/60 Ny6/LDPE blends: (a) LDPE, (b) 5.0 phr, (c) 1.5 phr, (d) 0.5 phr, (e) 0 phr of Na-EMAA, (f) Ny6.

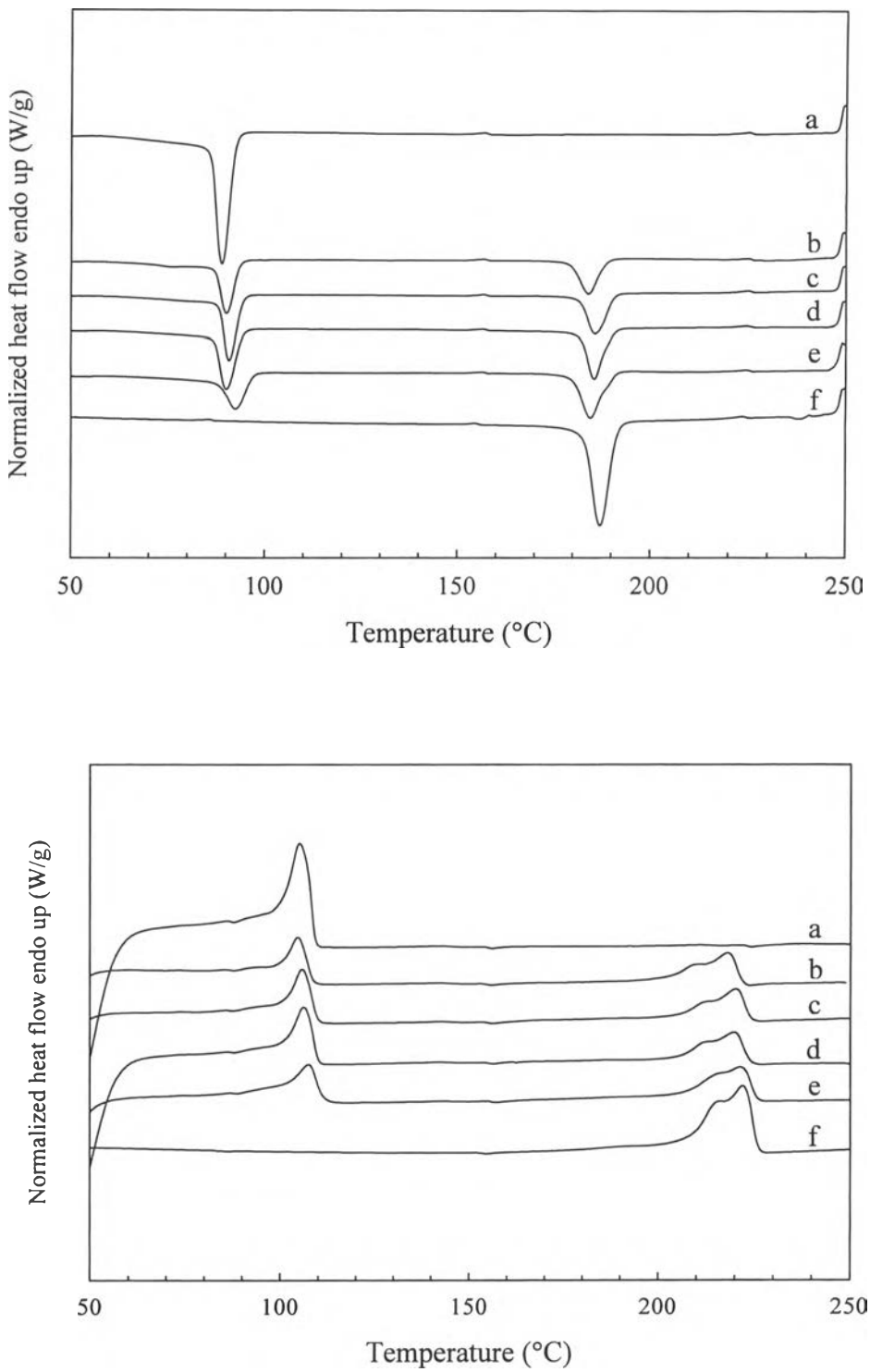

Figure E3 DSC thermograms of 50/50 Ny6/LDPE blends: (a) LDPE, (b) 5.0 phr, (c) 1.5 phr, (d) 0.5 phr, (e) 0 phr of Na-EMAA, (f) Ny6.

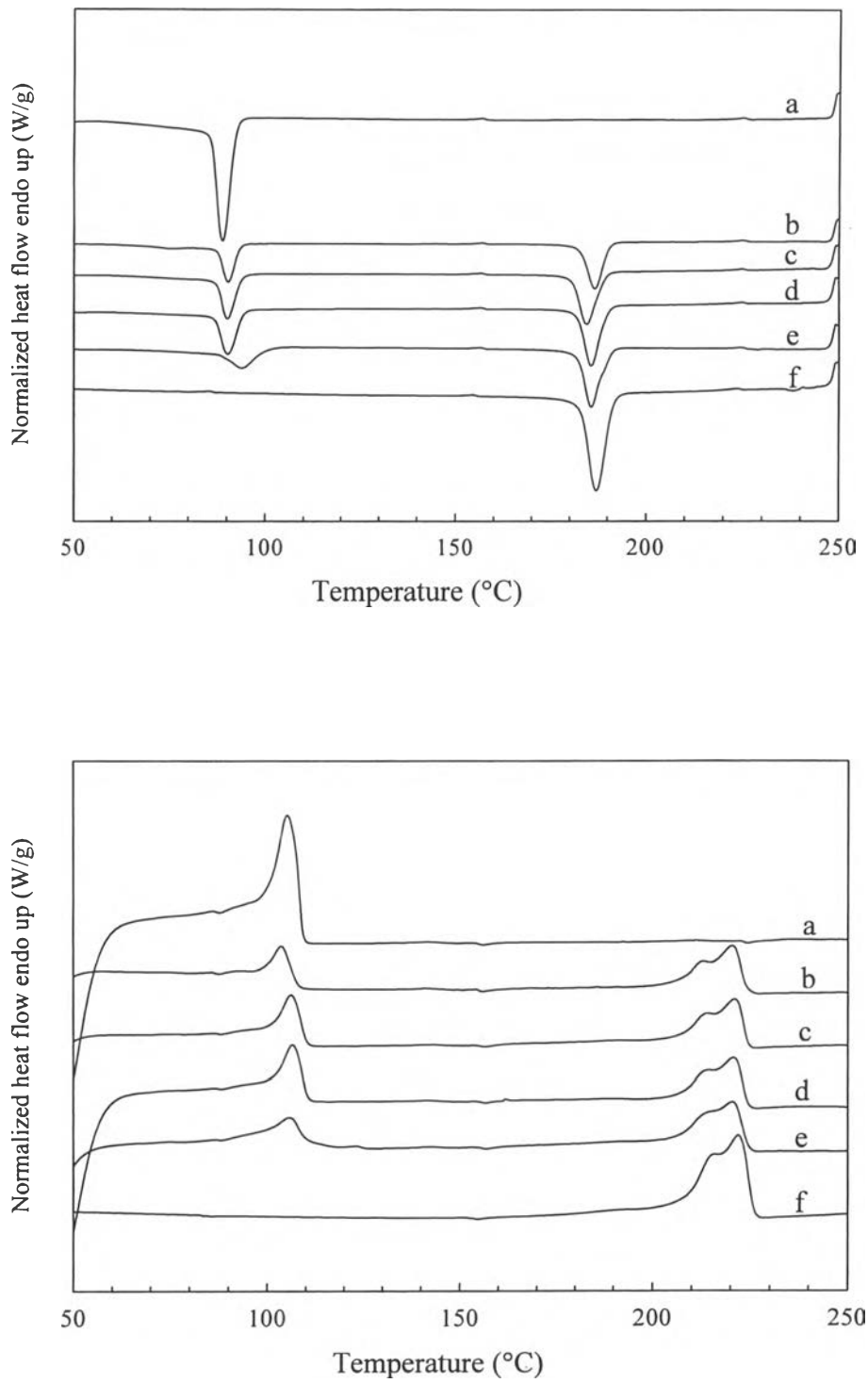

Figure E4 DSC thermograms of 60/40 Ny6/LDPE blends: (a) LDPE, (b) 5.0 phr, (c) 1.5 phr, (d) 0.5 phr, (e) 0 phr of Na-EMAA, (f) Ny6.

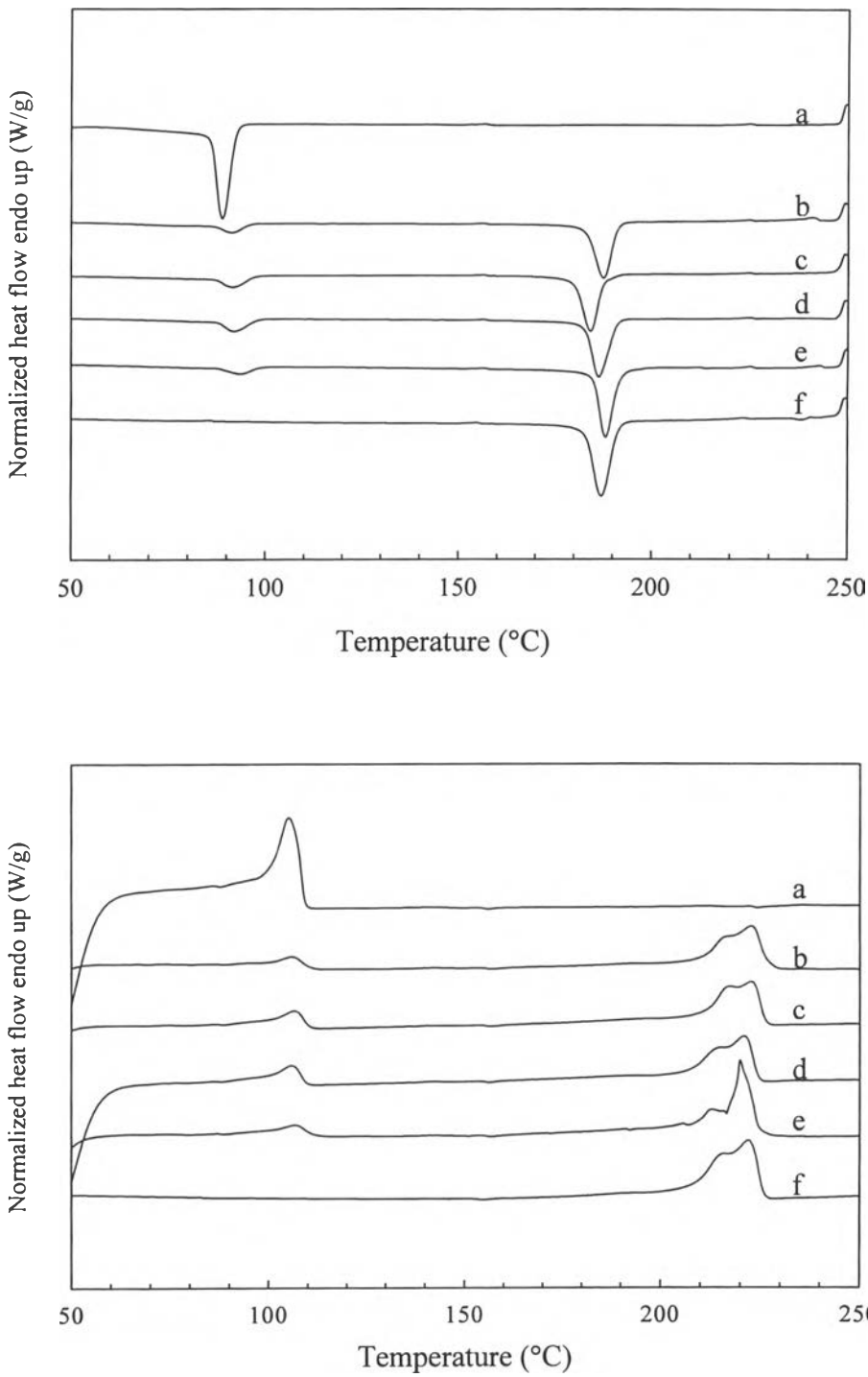

Figure E5 DSC thermograms of 80/20 Ny6/LDPE blends: (a) LDPE, (b) 5.0 phr, (c) 1.5 phr, (d) 0.5 phr, (e) 0 phr of Na-EMAA, (f) Ny6.

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