REFERENCES

Armat, R., and Moet, A. (1993). Morphological origin of toughness in polyethylene-nylon-6 blends. Polymer, 34(5), 977-985.

Brandrup, J., and Immergut, E.H. Eds. (1989). Polymer Handbook (1), 3rd Ed. John Wiley & Sons, V109-V116.

Chen, C., Fontan, E., Min, K., and White, J. (1988). An investigation of instability of phase morphology of blends of nylons with polyethylenes and polystyrenes and effects of compatibilizing agents. Polymer Engineering and Science, 28(2), 69-80.

Dagli, S., and Kamdar, K. (1994). Effects of component addition protocol on the reactive compatibilization of HDPE/PET blends. Polymer Engineering and Science, 34(23), 1709-1719.

Ganzeveld, K.J., and Janssen, L.P.B.M. (1992). The graftng of maleic anhydride on high density polyethylene in an extruder. Polymer Engineering and Science, 32(7), 467-474.

Guerrero, C., Lozano, T., Gonzalez, V., and Arroyo, E. (2001). Properties and morphology of poly(ethylene terephthalate) and high-density polyethylene blends. Journal of Applied Polymer Science, 82, 1382-1390.

Jiang,C., Filippi, S., and Magagnini, P. (2003). Reactive compatibilizer precursors for LDPE/PA6 blends. II: maleic anhydride grafted polyethlenes. Polymer, 44, 2411-2422.

Jurkowski, B., Kelar, K., and Ciesielska, D. (1998). Influence of chemical and mechanical compatibilization on structure and properties of polyethylene/polyamide blends. Journal of applied polymer science. 69, 719-727.

Koulouri, E.G., Georgaki, A.X., and Kallitsis, J.K. (1997). Reactive compatibilization of aliphatic polyamides with functionalized polyethylenes. Polymer, 38(16), 4185-4192.

Kudva, R.A., Keskkula, H., and Paul, D.R. (1999). Morphology and mechanical properties of compatibilied nylon6/polyethylene blends. Polymer, 40,

6003-6021.

Leclair, A., and Favis, B.D. (1996). The role of interfacial contact in immiscible binary polymer blends and its influence on mechanical properties. Polymer, 37(21), 4723-4728.

Leewajanakul, P., Pattanaolarn, R., Ellis, J.W., Nithitanakul, M., and Grady, B.P. (2003). Use of zinc-neutralized ethylene/methacrylic and copolymer ionomers as blend compatibilizers for nylon 6 and low-density polyethylene. Journal of Applied Polymer Science, 89, 620-629.

Lim, S., and White, J. (1994). Influence of a compatibilizing agent on the phase morphology of a polyethylene-polyamide 6 blend in a modular intermeshing co-rotating twin screw extruder. Polymer Engineering and Science, 34(3), 221-228.

Mascia, L., and Hashim, K. (1998). Compatibilization of poly(vinylidene fluoride)/nylon 6 blends by carboxylic acid functionalization and metal salts formation. Polymer, 39(2), 369-378.

Min, K., and White, J. (1984). Development of phase morphology in incompatible polymer blends during mixing and its variation in extrusion. Polymer Engineering and Science, 24(17), 1327-1336.

Psarski, M., Pracella, M., and Galeski, A. (2000). Crystal phase and crystallinity of polyamide 6/functionalized polyolefin blends. Polymer, 41, 4923-4932.

Sailaja, R.R.N., and Chanda, M. (2001). Use of maleic anhydride-grafted polyethylene as compatibilizer for HDPE-Tapioca starch blends: effects on mechanical properties. Journal of Applied Polymer Science, 80, 863-872.

Silva, E.F., and Soares, B.G. (1996). Polyethylene/polyamide-6 blends containing mercapto-modified EVA. Journal of Applied Polymer Science, 60, 1687-1694.

Valenza, A., Geuskens, G., and Spadaro, G. (1997). Blends of polyamide 6 and linear low density polyethylene functionalized with methacrylic acid derivatives. European Polymer Journal, 33(6), 957-962.

Valenza, A., Visco, A.M., and Acierno, D. (2002). Characterization of blends with polyamide 6 and ethylene acrylic acid copolymers at different

acrylic acid content. Polymer Testing, 21, 101-109.

Willis, J.M., and Favis, B.D. (1988). Processing-morphology relationships of compatibilized polyolefin/polyamide blends. Part I: The effect of an ionomer compatibilizer on blend morphology. Polymer Engineering and Science, 28(21), 1416-1426.

Yao, Z., Yin, Z., Sun, G., Liu, C., Tong, J., and Ren, L. (2000). Morphology, thermal behavior, and mechanical properties of PA6/UHMWPE blends with HDPE-g-MAH as a compatibilizing agent. Journal of Applied Polymer Science, 75, 232-238.

APPENDICES

Appendix A Scanning Electron Microscopic Analysis

Table A1 Number average diameter of dispersed phase size (D_n) of PA6/HDPE blends without Fusabond®

PA6/HDPE composition	80/20	60/40	50/50	40/60	20/80
D_n (μm)	12.03	11.65	8.74	7.70	4.97

Table A2 Number average diameter of dispersed phase size (D_n) of PA6/HDPE blends with Fusabond®

Fusabond (% wt.)	D_n of PA6/ HDPE blends (μm)				
	80/20	60/40	50/50	40/60	20/80
0	12.03	11.65	8.74	7.70	4.97
0.1	9.34	11.55	3.99	5.69	4.41
0.5	2.71	6.21	1.33	1.56	1.92
1.0	0.81	0.84	0.57	1.00	0.96
2.5	0.30	0.33	0.31	0.62	0.61
5.0	0.28	0.31	0.24	0.49	0.38
35	0.15	0.11	0.21	0.15	0.18

Appendix B Differential Scanning Calorimetric Analysis

Table B1 Delta H (ΔH) of PA6 and HDPE components in the PA6/HDPE blends

PA6/HDPE composition	ΔH of PA6 (J/g)	ΔH of HDPE (J/g)
100/0	67.5	-
80/20	47.3	24.1
60/40	38.0	45.6
50/50	32.9	58.6
40/60	22.7	73.5
20/80	11.2	100.6
0/100	-	127.7

Table B2 Delta H (ΔH) of PA6 component in the PA6/HDPE blends with Fusabond®

Fusabond (% wt.)	ΔH of PA6 component in PA6/HDPE blend (J/g)				
	80/20	60/40	50/50	40/60	20/80
0	47.3	38.0	32.9	22.7	11.2
0.1	48.6	37.1	35.1	19.3	9.1
0.5	45.5	34.8	30.6	23.4	7.3
1.0	43.8	32.9	26.3	19.3	9.9
2.5	44.5	33.7	32.8	23.3	10.4
5.0	47.0	36.7	31.2	18.0	14.2
10.0	45.0	30.8	26.2	20.2	10.3
15.0	40.2	30.3	25.1	20.2	9.7
35.0	31.6	24.6	22.8	13.4	6.5

Table B3 Delta H (ΔH) of HDPE component in the PA6/HDPE blends with Fusabond®

Fusabond (% wt.)	ΔH of HDPE component in PA6/HDPE blend (J/g)				
	80/20	60/40	50/50	40/60	20/80
0	24.1	45.6	58.6	73.5	100.6
0.1	25.9	46.1	63.9	78.8	102.1
0.5	29.3	51.9	65.2	74.0	105.4
1.0	39.4	63.9	72.1	83.2	106.3
2.5	36.1	63.4	68.0	88.6	118.3
5.0	37.8	58.8	70.6	82.2	112.3
10.0	41.3	61.4	72.5	85.4	108.3
15.0	40.3	63.2	73.4	84.7	108.4
35.0	47.3	67.0	74.0	90.8	109.4

- **Pure Fusabond®: ΔH = 137.8 J/g**

Appendix C Tensile properties, Impact strength, and Hardness

Table C1 Tensile modulus of PA6/HDPE blends without Fusabond®

PA6/HDPE composition	100/0	80/20	60/40	50/50	40/60	20/80	0/100
Tensile modulus (MPa)	3408.32	3170.04	2414.53	2019.30	2548.07	2560.53	2847.79

Table C2 Tensile modulus of PA6/HDPE blends with Fusabond®

Fusabond (% wt.)	Tensile modulus of PA6/HDPE blends (MPa)				
	80/20	60/40	50/50	40/60	20/80
0	3170.04	2414.53	2019.30	2548.07	2560.53
0.1	3332.37	2754.37	2748.29	2799.27	2521.75
0.5	3356.43	3204.36	2899.56	2948.94	2626.14
1.0	3431.65	3080.79	2912.98	2912.47	2794.61
2.5	4172.67	3552.70	3444.74	3054.83	3004.84
5.0	4374.62	3651.01	3445.67	3506.52	2874.13
10.0	4519.32	3931.53	3561.79	3451.96	2427.48
15.0	4199.15	3105.88	3051.86	3008.23	2216.36
35.0	2616.34	2065.27	1981.70	1839.37	1785.97

Table C3 Tensile strength of PA6/HDPE blends without Fusabond®

PA6/HDPE composition	100/0	80/20	60/40	50/50	40/60	20/80	0/100
Tensile strength (MPa)	59.12	34.77	23.75	16.23	14.36	20.41	27.38

Table C4 Tensile strength of PA6/HDPE blends with Fusabond®

Fusabond (% wt.)	Tensile strength of PA6/HDPE blends (MPa)				
	80/20	60/40	50/50	40/60	20/80
0	34.77	23.75	16.23	14.36	20.41
0.1	32.06	24.78	27.37	19.78	21.82
0.5	34.72	35.40	31.39	24.54	26.32
1.0	39.08	35.97	32.69	29.44	28.26
2.5	39.72	37.18	33.56	29.53	27.32
5.0	44.75	38.91	35.26	30.17	27.74
10.0	47.06	38.16	34.96	29.24	26.99
15.0	45.15	38.12	33.35	30.34	28.02
35.0	34.89	30.14	27.02	27.44	26.62

Table C5 Impact strength of PA6/HDPE blends without Fusabond®

PA6/HDPE composition	100/0	80/20	60/40	50/50	100/0
Impact strength (J/m)	101.03	112.07	77.42	94.82	227.32

Table C6 Impact strength of PA6/HDPE blends with Fusabond®

Fusabond (% wt.)	Impact strength of PA6/HDPE blends (J/m)		
	80/20	60/40	50/50
0	112.07	77.42	94.82
0.1	95.42	45.36	66.79
0.5	80.41	59.77	56.24
1.0	117.1	70.17	65.79
2.5	120.85	105.59	79.13
5.0	137.05	127.00	108.45
10.0	141.55	135.86	123.91
15.0	151.3	146.54	140.31
35.0	369.76	305.97	362.36

Table C7 Hardness of PA6/HDPE blends without Fusabond®

PA6/HDPE composition	100/0	80/20	60/40	50/50	40/60	20/80	0/100
Hardness (R scale)	98.51	82.32	43.40	32.77	44.62	53.80	47.48

Table C8 Hardness of PA6/HDPE blends with Fusabond®

Fusabond (% wt.)	Hardness of PA6/HDPE blends (R scale)				
	80/20	60/40	50/50	40/60	20/80
0	82.32	43.40	32.77	44.62	53.80
0.1	86.43	79.04	74.29	61.33	54.85
0.5	85.94	79.82	74.98	63.71	57.26
1.0	88.30	80.15	75.14	62.26	58.39
2.5	89.93	81.82	75.37	64.53	58.65
5.0	88.15	82.23	76.37	65.85	62.57
10.0	88.73	79.59	71.73	70.42	66.32
15.0	90.00	78.75	73.13	69.72	63.50
35.0	87.84	73.96	65.84	63.09	60.96

CURRICULUM VITAE

Name: Ms. Sureerat Sangwijit

Date of Birth: July 11, 1980

Nationality: Thai

University Education:

1998-2002 Bachelor of Science Degree in Chemistry, Faculty of Science, Srinakharinwirot University, Bangkok, Thailand.