REFERENCES

Agarwal, P.K., Horrion, J. (1989). Thermal and mechanical properties of blends of a low density polyethylene and ethylene-acrylic acid copolymers. Polymer communications, 30, 264-267.

Aklonis, J.J., and Macknight, W.J. (Eds.). (1983). Introduction of Polymer Viscoelastic. New York: John Wilson and sons.

Bikiaris, D., Prinos, J., and Perrier, C. (1997). Thermoanalytical study of the effect of EAA and starch on the thermo-oxidative degradation of LDPE. Polymer Degradation and Stability, 57, 313-324.

Cardoso, R.S., Simoes, A.L.C., Diez Filho, M.A., and Mendes, L.C. (1998). HDPE/ROSIN blends: I-Morphology, mechanical and rheological properties. Polymer Bulletin, 40, 779-786.

Chen, Y.S., Hsu, T.J., and Chen, S.I. (1991). Vibration damping characteristics of laminated steel sheet. Metallurgical Transactions A, 22A, 653-656.

Daniel, W.F., Richard, R.A. (1985). Encyclopedia of Polymer Science and Engineering. New York: John Wiley.

Eguiburn, J.L., Irin, J.J., and Fernandez-Berridi, M.L. (1998). Blends of amorphous and crystalline polylactides with poly(methyl methacrylate) and poly (methyl acrylate): a miscibility study. Polymer, 39, 6891-6897.

Erro, R., Gaztelumendi, M., and Nazabal, J. (2000). Effect of the chemical structure on the miscibility level and poperties of phenoxy/polyn\methacrylate blends. Journal of Applied Polymer Science, 77, 2978-2986.

Fairley, G., and Prud Homme, R.E. (1987). A contribution to the understanding of polyethylene/ionomer/polyamide-6 blends. Polymer Engineering and Science, 27, 20, 1495-1503.

Favis, B.D., and Chalifoux, J.P. (1998). Influence of composition on the morphology of polypropylene/polycarbonate blends. Polymer, 29, 1761-1767.

Folkes, M.J., Hope, P.S. (1991). Polymer blends and Alloys. 1st ed., Chapman and Hall.

Grady, B.P., Genetti, W.B., Lamirand, R.J., and Shaha, M. (2000). An investigation of heat transfer effects in isothermal crystallization studies of low-density polyethylene.

George, O., (1991). Principles of polymerization. New York: John Wiley and sons.

Jo, W.H., kwon, Y.K., and Kwon, I.H. (1991). Phase behavior of terpolymer blends of poly(styrene-co-acrylic acid), poly(ethylenen oxide), and poly(methyl methacrylate). Macromolecules, 24, 4708-4712.

Kang, N., Xu, Y.Z., Wu, J.G., Feng, W., Weng S.F., and Xu, D.F. (2000). The correlation between crystalline behavior of polyethylene segments and hydrogen bonds among carboxyl groups in ethylene-acrylic acid copolymers. Physical Chemistry Chemical Physics, 2, 3627-3630.

Liao Fu-Sen., Tzu-Chien J.H. (1992). Prediction of vibration damping properties of polymer-laminated steel sheet using time-temperature superposition principle. Journal of Applied Polymer Science, 45, 893-900.

Meng, Y.Z., and Yjong, S.C. (1999). Preparation and properties of injection-moulded blends of poly(vinyl chloride) and liquid crystal copolyester. Polymer, 40, 2711-2718.

Mohanty, S., Roy, S., Santra, R.N., and Nando, G.B. (1995). Miscibility of blends of epoxidized natural rubber and poly(ethylene-co-acrylic acid). Journal of Applied Polymer Science, 58, 1947-1957.

Mohanty, S., Vijavan, K., Neelkantan, N.R., and Nando, G.B. (1997). Mechanical and dynamic mechanical properties of zinc neutalized salts of poly (ethylene-co-crylic acid) and its blends with epoxidized natural rubber. Polymer Engineering and Science, 37, 8, 1395-1400.

Murayama, T. (1978). Dynamic Mechanical Analysis of Polymeric Material, New York: Elsevier Scientific Publishing.

Painter, P.C., and Coleman, M.M. (Eds.). (1997). Fundamentals of Polymer Science, Pensyvania: Technomic Publishing.

Peiffer, D.G., Antony, P., and De, S.K. (1998). Compatibilization of ionomeric polyblends by intermolecular ionic interactions. Rubber Chemistry and Technology, 72, 449-463.

Ridgeway, A.L., and Mergenhagen, L.K. (1992). Ethylene acrylic acid-polybutylene blends for packaging applications. Tappi Journal, 76, 1, 169-173.

Yoshikawa, K., Molnar, A., and Eisenberg, A. (1994). Rheological properties of blends of lithium- or sodium- sulfonated polystyrene ionomers with polyamide6. Polymer Engineering and Science, 34, 13, 1056-1064.

Zhao, Hei, Z., Wang, Z., and Thang, B. (1999). Studies on blends LLDPE and ethylene-methacrylic acid random copolymer. European Polymer Journal, 35, 355-360.

APPENDICES

Appendix A Mean Value of Mechanical Properties of ESCOR®310/EAAs Blends

Tensile Properties of ESCOR®310/EAAs Blends

- Young's modulus of ESCOR®310/EAAs Blends

Table A1 Young's modulus of ESCOR®310/EAAs blends

EAA Content	EAA1	EAA2	EAA4	EAA5
0	145.8	145.8	145.8	145.8
5	151.2	169.1	145.9	160.6
10	184.5	200.8	153.6	156.4
20	202.7	205.2	212.7	195.9
30	262.7	265.1	250.3	147.4
40	338.4	288.8	245.0	226.6
50	457.1	261.6	245.9	283.2
60	358.8	276.6	253.7	202.2
70	371.3	296.5	330.2	180.5
80	382.9	338.9	347.9	152.5
90	400.8	415.5	344.3	176.8
95	434.2	433.6	300.9	186.2
100	429.9	386.2	414.5	201.4

- Tensile Strength at Break of ESCOR®310/EAAs Blends

Table A2 Tensile strength at break of ESCOR®310/EAAs blends

EAA Content	EAA1	EAA2	EAA4	EAA5
0	10.24	10.24	10.24	10.24
5	9.71	10.15	10.61	9.99
10	9.84	10.32	10.92	10.75
20	10.00	10.65	10.97	11.52
30	10.36	10.90	11.54	11.92
40	10.81	11.32	11.51	12.48
50	10.99	12.03	11.99	13.08
60	11.65	12.31	12.02	13.70
70	12.22	12.54	12.22	14.27
80	12.48	12.63	13.01	14.78
90	12.62	13.28	13.29	15.13
95	12.71	13.44	13.17	15.29
100	12.72	14.02	13.84	13.83

- Elongation at Break of ESCOR®310/EAAs Blends

Table A3 Elongation at break of ESCOR®310/EAAs blends

EAA Content	EAA1	EAA2	EAA4	EAA5
0	683.80	683.80	683.80	683.80
5	685.00	700.57	682.53	671.05
10	677.94	681.75	666.97	675.05
20	670.00	677.77	656.55	670.00
30	637.63	663.6	631.93	665.05
40	622.13	656.35	624.30	647.70
50	620.97	642.40	616.33	644.95
60	603.30	614.33	605.37	629.87
70	566.97	587.02	604.27	599.62
80	563.47	585.32	594.65	598.07
90	553.65	584.82	588.87	575.5
95	463.67	559.20	551.27	567.05
100	541.57	595.25	592.13	582.30

- Hardness of ESCOR®310/EAAs Blends

Table A4 Hardness of ESCOR®310/EAAs blends

EAA Content	EAA1	EAA2	EAA4	EAA5
0	47.54	47.54	47.54	47.54
5	46.90	47.28	48.88	48.96
10	47.88	47.38	49.41	48.46
20	48.90	48.54	49.80	50.02
30	49.10	48.74	50.08	49.30
40	49.56	50.34	51.58	51.24
50	50.40	50.80	51.72	51.68
60	51.56	51.12	52.76	52.34
70	51.88	52.48	52.92	53.56
80	53.20	53.16	53.88	55.68
90	53.72	53.68	54.00	55.44
95	53.16	54.58	55.14	55.74
100	53.86	54.82	53.86	53.94

- Gloss Properties of ESCOR®310/EAAs Blends

Table A5 Gloss value at 60° of ESCOR®310/EAAs blends

EAA Content	EAA1	EAA2	EAA4	EAA5
0	94.0	94.0	94.0	94.0
20	87.7	91.9	95.2	85.0
40	84.8	88.1	87.8	94.0
60	87.2	88.0	85.4	94.8
80	89.0	86.2	83.2	95.0
100	89.4	85.7	88.8	98.0

Table A6 Gloss value at 20° of ESCOR®310/EAAs blends

EAA Content	EAA1	EAA2	EAA4	EAA5
0	72.8	72.8	72.8	72.8
20	65.9	70.2	75.0	63.6
40	61.1	69.9	67.2	72.3
60	65.0	71.1	63.7	73.2
80	69.2	68.3	65.2	75.7
100	71.3	66.9	68.7	75.7

Appendix B Rheological Properties of ESCOR®310/EAA5 Blends

Table B1 Rheological properties (G', dyn/cm^2) of ESCOR®310/EAA5 blends

Freq (rad/s)	EAA Content					
	0	20	40	60	80	100
0.10000	2037.94	1790.53	1652.41	1549.99	1446.74	1330.39
0.15849	2653.72	2469.45	2290.27	2151.03	1947.97	1966.81
0.25119	3487.57	3345.36	3162.90	2868.14	2756.96	2633.86
0.39811	4510.47	4367.27	4088.70	3894.34	3622.70	3496.56
0.63096	5763.72	5663.18	5420.30	5072.88	4896.24	4649.76
1.00000	7453.54	7390.98	6991.18	6639.67	6430.47	6155.55
1.58489	9489.07	9393.75	8932.36	8590.36	8363.24	8035.41
2.51189	11763.35	11874.5	11365.36	10854.00	10795.60	10321.00
3.98107	14776.40	14920.70	14284.84	13811.70	13757.80	13145.75
6.30957	18238.00	18568.30	17844.30	17192.50	17404.45	16587.90
10.0000	22438.20	22997.55	22078.00	21421.95	21845.55	20722.30
15.8489	27591.20	28195.00	27087.00	26454.70	27178.65	25768.00
25.1189	33836.40	34765.05	33547.20	32846.55	33810.70	39504.75
39.8107	41060.65	42249.20	40861.20	40091.95	41471.25	48429.60
63.0957	49765.95	51301.75	49628.65	48998.95	50903.35	59352.25
100.000	60557.00	62390.50	60513.25	59767.20	62289.65	64587.31

Table B2 Rheological properties (G", dyn/cm^2) of ESCOR®310/EAA5 blends

Freq (rad/s)	EAA Content					
	0	20	40	60	80	100
0.10000	1206.41	931.85	876.57	861.61	646.61	774.04
0.15849	1597.84	1392.25	1218.93	1199.47	893.06	1063.84
0.25119	2248.37	2053.71	1834.20	1614.23	1330.87	1574.22
0.39811	3158.05	2869.05	2609.32	2317.19	2036.40	2022.59
0.63096	4334.18	4005.72	3658.31	3337.33	2932.055	2982.79
1.00000	5909.42	5426.50	5080.79	4698.25	4206.83	4108.08
1.58489	7879.57	7493.79	7004.84	6443.91	5853.27	5753.46
2.51189	10553.45	9914.10	9329.58	8631.59	8084.59	7739.88
3.98107	13696.75	13224.20	12455.90	11691.85	11024.60	10601.15
6.30957	17808.05	17469.20	16494.40	15460.85	14738.95	14254.40
10.0000	23166.95	22757.45	21565.95	20300.00	19565.80	18824.45
15.8489	29475.45	29293.80	27869.50	26428.50	25745.35	24535.00
25.1189	37780.65	37700.90	35887.45	34229.99	33548.85	32089.2
39.8107	47519.65	47677.20	45676.40	43673.70	43220.55	41160.05
63.0957	59443.00	59983.65	57625.15	55275.65	55317.05	52446.00
100.000	74397.95	75344.6	72671.45	69775.45	70296.20	66416.80

Table B3 Rheological properties (Eta*, Pa-s) of ESCOR®310/EAA5 blends

Freq (rad/s)	EAA Content					
	0	20	40	60	80	100
0.6	11670.20	10993.95	10364.20	9623.87	8982.36	11670.20
1	9667.84	9169.65	8642.51	8133.83	7629.33	9667.84
10	3290.49	3169.15	3086.31	2951.27	2903.45	3290.49
100	979.14	962.89	945.67	918.76	929.02	979.14

X-Ray Diffraction Measurement of ESCOR®310/EAAs Blends

Table B4 Crystal lattice structure and percent crystallinity of ESCOR®310/EAA1 blends from X-ray measurement

EAA 2 Content	Percent Crystallinity	d-spacing		2θ	
		110	200	110	200
0	11.8	4.18	3.76	21.22	23.66
10	10.0	4.14	3.74	21.46	23.80
20	12.5	4.12	3.74	21.58	23.80
40	13.2	4.12	3.74	21.54	23.82
60	13.8	4.12	3.74	21.56	23.78
80	16.1	4.13	3.72	21.52	23.88
90	16.9	4.15	3.77	21.38	23.70
100	20.1	4.14	3.74	21.44	23.76

Table B5 Crystal lattice structure and percent crystallinity of ESCOR®310/EAA2 blends from X-ray measurement

EAA 2 Content	Percent Crystallinity	d-spacing		2θ	
		110	200	110	200
0	11.8	4.18	3.76	21.22	23.66
20	5.2	4.15	3.74	21.38	23.76
40	9.7	4.19	3.77	21.16	23.60
60	10.4	4.18	3.76	21.24	23.62
80	16.0	4.14	3.74	21.44	23.78
100	18.2	4.12	3.75	21.50	23.72

Table B6 Crystal lattice structure and percent crystallinity of ESCOR®310/EAA4 blends from X-ray measurement

EAA 4 Content	Percent Crystallinity	d-spacing		2θ	
		110	200	110	200
0	11.8	4.18	3.76	21.22	23.66
20	11.5	4.14	3.72	21.48	23.88
40	14.0	4.16	3.76	21.34	23.64
60	13.1	4.14	3.73	21.46	23.82
80	14.9	4.15	3.75	21.38	23.72
100	15.6	4.17	3.78	21.30	23.52

Table B7 Crystal lattice structure and percent crystallinity of ESCOR®310/EAA5 blends from X-ray measurement

EAA 5 Content	Percent Crystallinity	d-spacing		2θ	
		110	200	110	200
0	11.8	4.18	3.76	21.22	23.66
20	9.3	4.15	3.74	21.40	23.74
40	12.2	4.17	3.77	21.28	23.58
60	12.5	4.14	3.74	21.46	23.80
80	14.0	4.18	3.77	21.24	23.58
100	10.8	4.18	3.75	21.20	23.68

Appendix C Melting, Crystalline Temperature, and Percent Crystallinity of ESCOR®310/EAAs Blends Measured by DSC

Table C1 Melting, crystallization temperature, and percent crystallinity of blends ESCOR®310/EAA1 measured by DSC

EAA1 Content	T_m (°C)	T_c (°C)	%Crystallinity
0	88.85	75.32	15.32
5	88.85	77.15	17.49
10	89.25	77.57	15.00
20	89.01, 100.27	76.89, 85.57	14.68
30	89.25, 100.14	76.63, 87.23	12.98
40	89.52, 100.76	75.97, 88.48	6.92
50	89.52, 101.08	75.57, 88.82	7.62
60	90.46, 101.22	75.30, 89.23	6.57
70	90.978, 101.58	74.64, 89.15	11.75
80	101.43	74.64, 89.48	17.49
90	101.75	89.48	14.97
95	101.75	89.48	14.06
100	101.10	87.82	16.41

Table C2 Melting, crystallization temperature, and percent crystallinity of ESCOR® 310/EAA2 blends measured by DSC

EAA2 Content	T_m (°C)	T_c (°C)	%Crystallinity
0	88.85	75.32	15.32
5	90.10	76.15	13.88
10	90.77	77.32	13.95
20	92.85	81.23	16.85
30	94.92	81.32	20.59
40	95.14	81.54	14.21
50	95.35	81.82	10.36
60	96.85	83.90	12.02
70	97.35	84.56	11.63
80	98.18	85.32	13.11
90	98.50	85.57	14.64
95	98.33	85.57	13.42
100	97.85	84.23	14.31

Table C3 Melting, crystallization temperature, and percent crystallinity of ESCOR® 310/EAA4 blends measured by DSC

EAA4 Content	T_m (°C)	T_c (°C)	%Crystallinity
0	88.85	75.32	15.32
5	89.93	75.98	11.86
10	90.52	76.73	14.02
20	90.00	77.84	16.20
30	91.85	79.90	17.97
40	93.18	79.20	13.07
50	94.68	81.90	15.08
60	95.60	82.32	12.27
70	96.18	82.98	13.42
80	96.68	83.32	13.37
90	96.60	83.57	15.11
95	96.60	83.65	14.71
100	97.35	82.48	15.80

Table C4 Melting, crystallization temperature, and percent crystallinity of ESCOR® 310/EAA5 blends measured by DSC

EAA5 Content	T_m (°C)	T_c (°C)	%Crystallinity
0	88.85	75.32	15.32
5	87.60	74.23	12.54
10	89.02	74.65	14.73
20	89.60	75.15	14.32
30	89.77	75.40	15.68
40	89.17	75.15	13.51
50	90.68	76.23	14.32
60	91.52	77.32	13.39
70	91.93	78.15	14.14
80	92.02	78.43	12.32
90	92.43	78.82	13.48
95	92.93	79.07	13.48
100	93.77	76.57	16.12

Appendix D Dynamic Mechanical Properties of ESCOR®310/EAAs blends

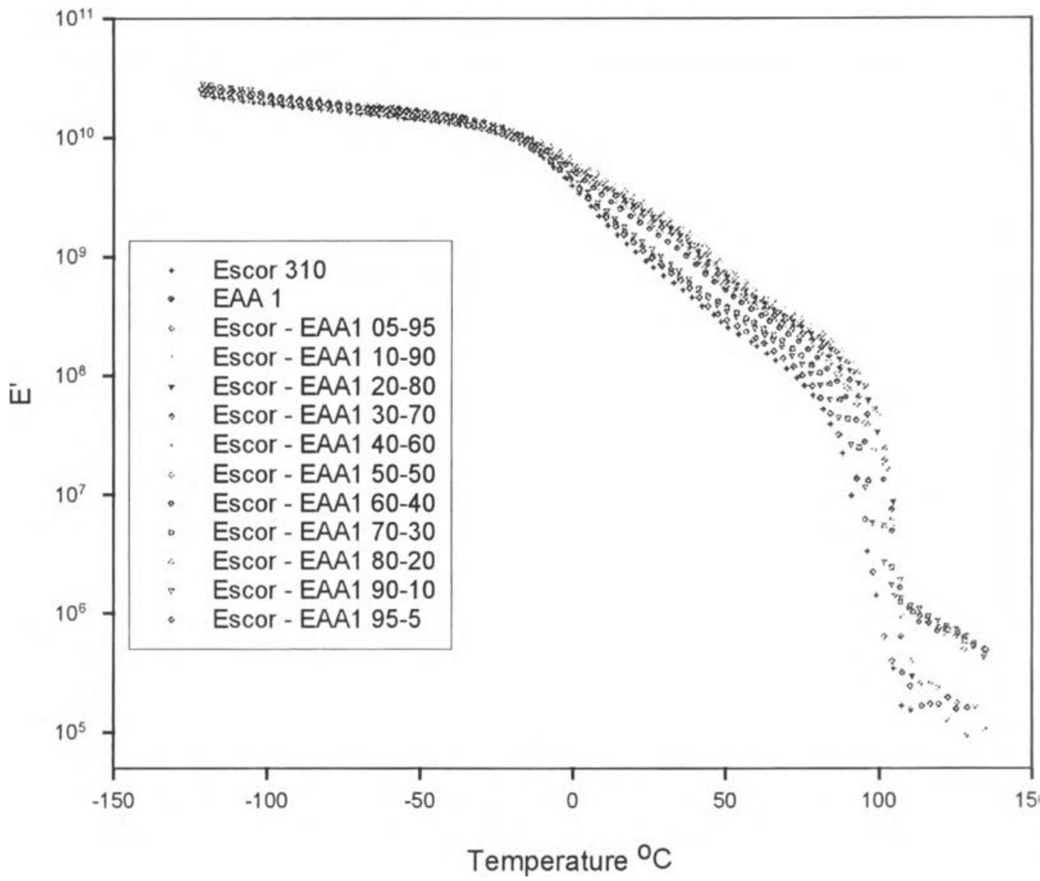

Figure D1 Storage dynamic mechanical properties (E') of ESCOR®310/EAA1

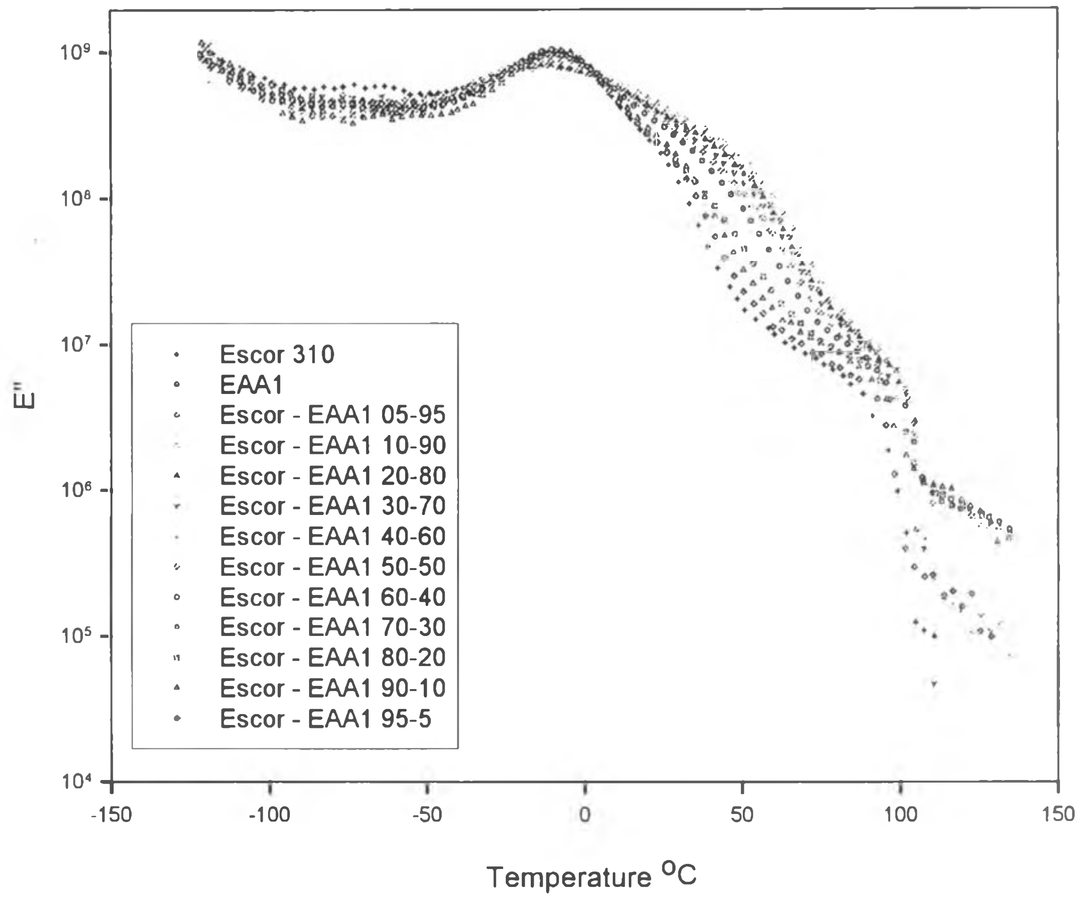

Figure D2 Loss dynamic mechanical properties (E") of ESCOR®310/EAA1.

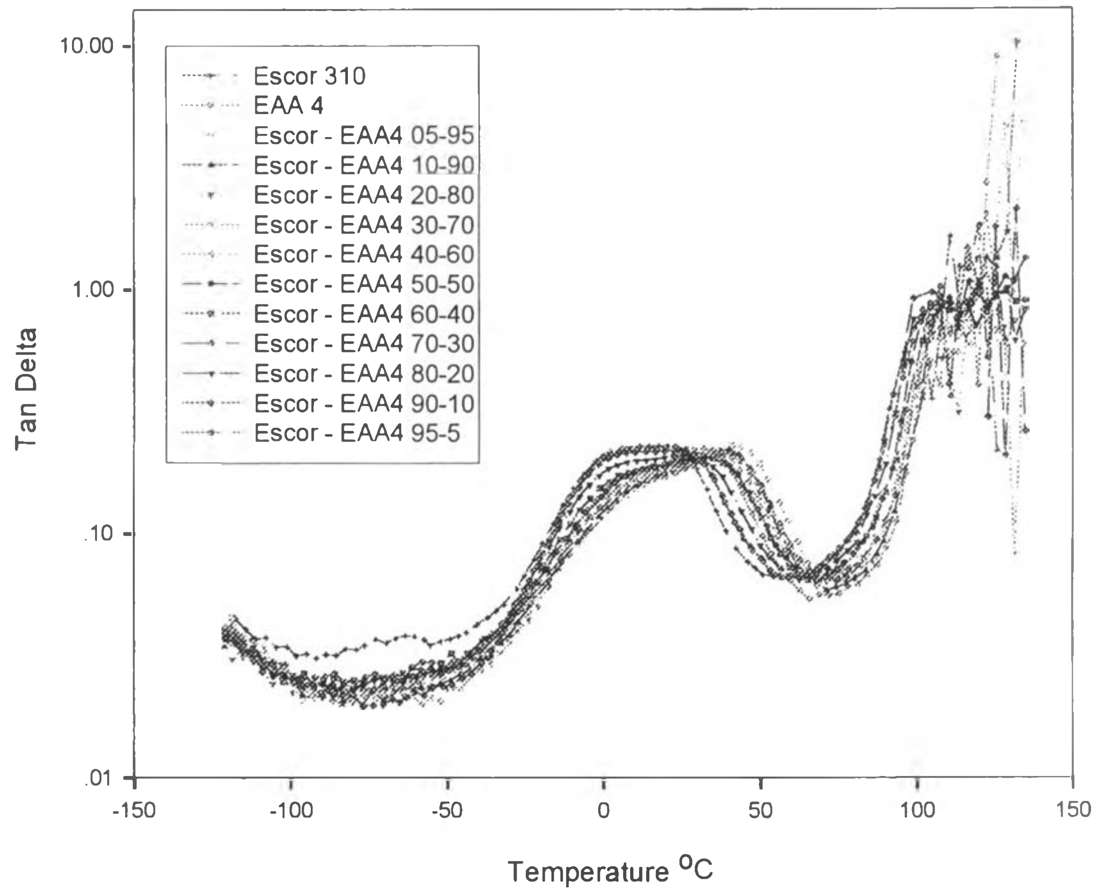

Figure D5 Tan delta dynamic mechanical properties (tan δ) of ESCOR®310/EAA4.

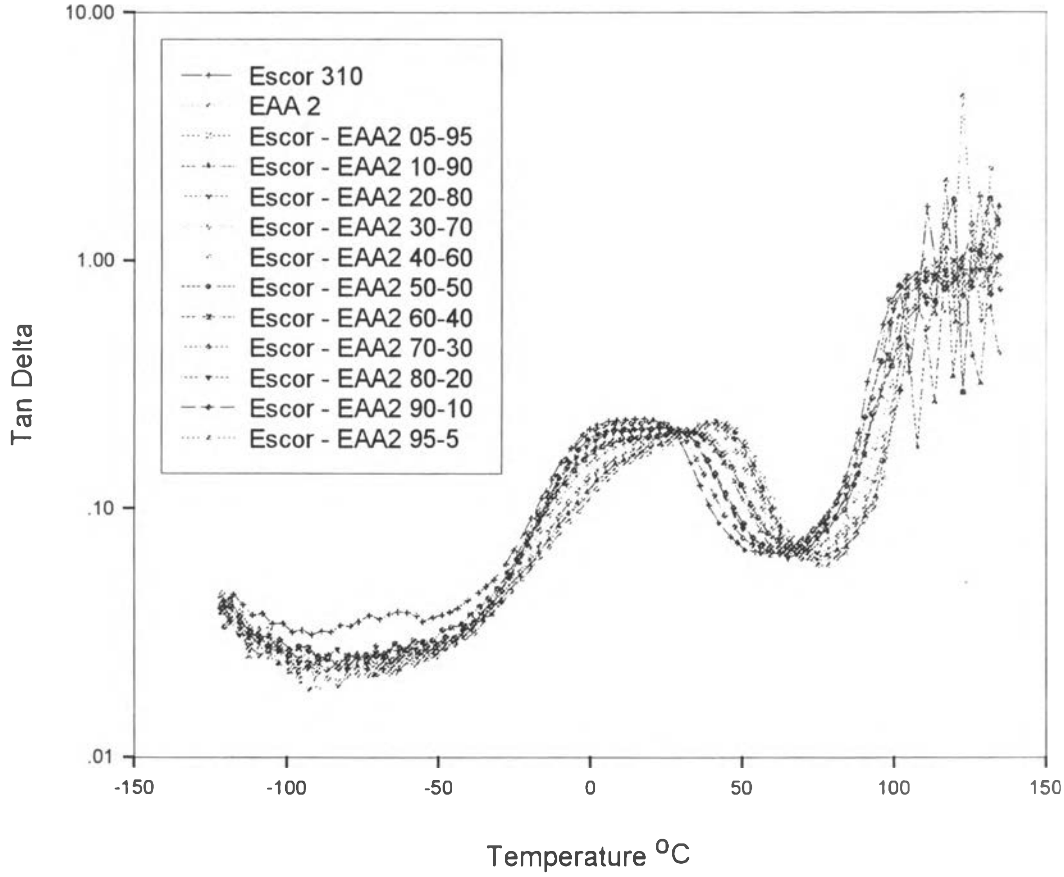

Figure D4 Tan delta dynamic mechanical properties (tan δ) of ESCOR®310/EAA2.

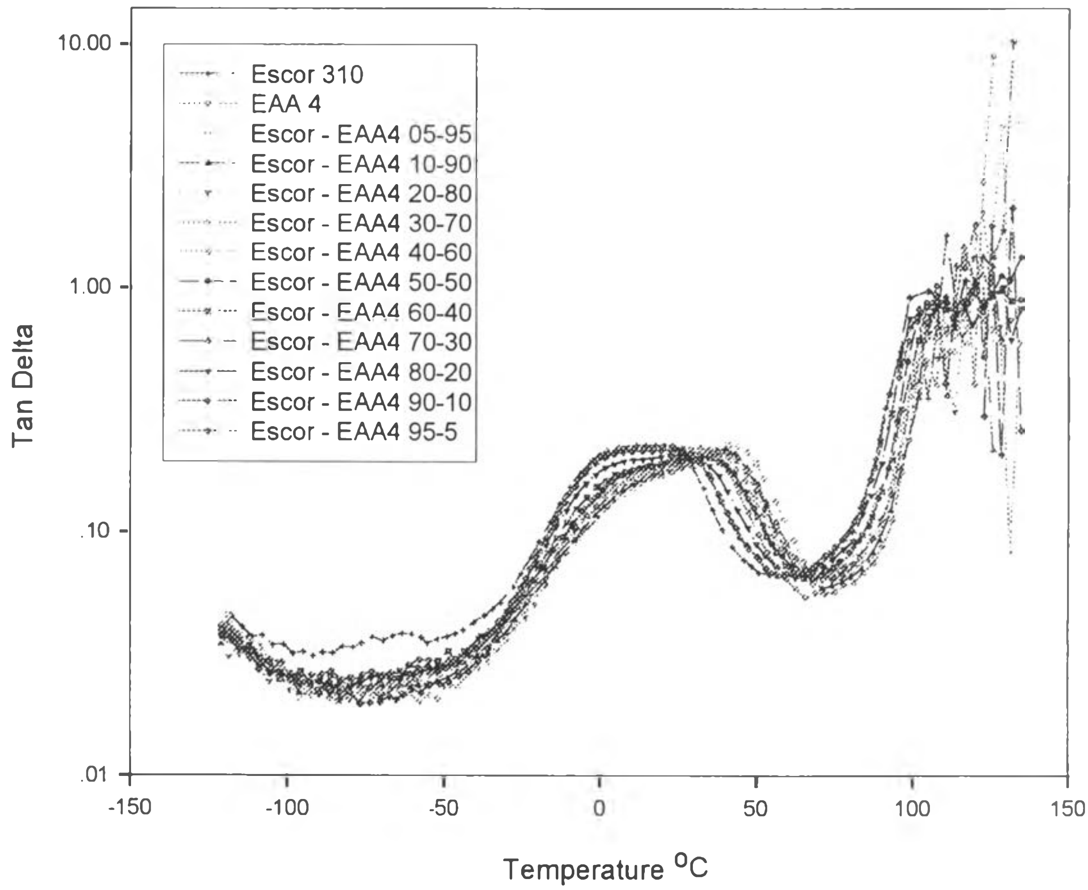

Figure D5 Tan delta dynamic mechanical properties (tan δ) of ESCOR®310/EAA4.

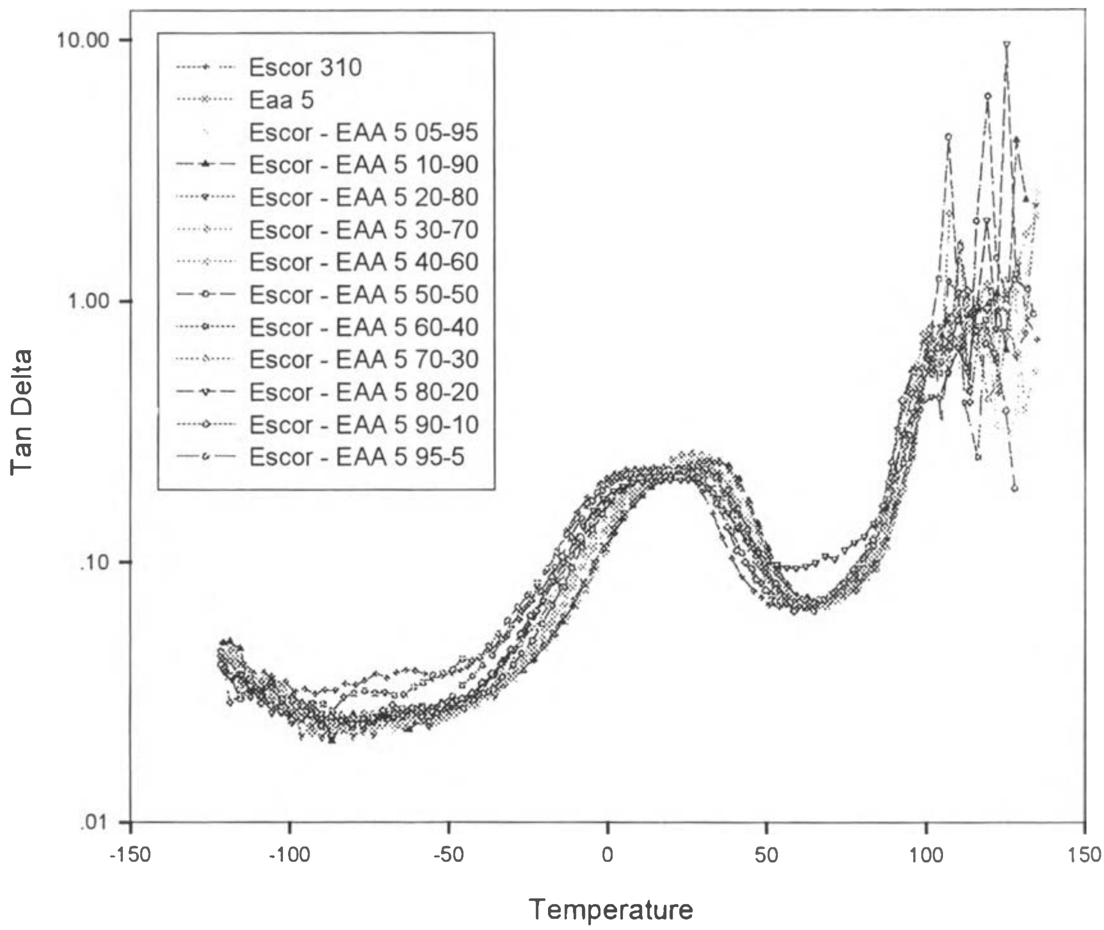

Figure D6 Tan delta dynamic mechanical properties (tan δ) of ESCOR®310/EAA5.

CURRICULUM VITAE

Name: Ms. Nuttakan Pongrakananon

Date of birth: July 15, 1979

Nationality: Thai

University Education:

1996-1999 Bachelor Degree of Science in Chemistry, Kasetsart University, Bangkok, Thailand (Honor)