REFERENCES

Abdullilah, I., Ahmad, S., and Sulaiman, S. (1995). Blending of natural rubber with linear low-density polyethylene. Appilied of Polymer Science, 58, 1125-1133.

Barnes, H. A., Hutton, J. F., and Walters, F. R. S. (1989). An introduction to rheology. Elsview.

Brandrup J., and Immergut, E. H. (Eds.) (1989). Polymer handbook. Vol.2. (441-434). New York: John Wiley & Son.

Chesters, A. K. (1991). The modeling of coalescence processes in fluid-liquid dispersions: a review of current understanding. Trans Chem E, 69, 259-270.

Choi, G. D., Won, H. J., and Kim, H. G. (1996). The effect of the viscosity ratio of dispersed phase to matrix on the rheological, morphological, and mechanical properties of polymer blends containing a LCP. Applied Polymer Science, 59, 443-452.

Cook, W. D., Zhang, T., Moad, G., Deipan, G. V., Cser, F., Fox, B., and Shea, M. O. (1996). Morphology-property relationships in ABS/PET blends. I. Compositional effects. Applied Polymer Science, 62(10), 1699-1708.

Dealy, J. M., and Wissbrum, K. F. (1990). Melt rheology and its role in plastic processing. London: Chapman & Hall.

Doi, M., and Ohta, T. (1991). Dynamics and Rheology of complex interfaces. Chem. Phys., 95, 1242-1248.

Favis, B. D., and Chalifoux, J. P. (1987). The viscosity ratio on the morphology of polypropylene/polycarbonate blends during processing. Polymer Engineering and Science, 27(20), 1591-1600.

Foles, M. J., and Hope, P.S. (Eds.) (1993). Polymer blends and alloy. London: Chapman & Halls.

Graebling, D., Muller, R. and Palierne, J. F. (1993). Linear viscoelastic behavior of some incompatible polymer blends in the melt: Interpretation of data with a model of emulsion of viscoelastic liquids. Macromolecules, 26, 320-329.

Henri U. (1993). Introduction to industrial polymer. New York: Hanser.

James, E. M. (Ed.) (1996). Physical properties of polymer handbook. New York: American Institute of Physics.

Kim, R. J., Jamieson, A. M., Hudson, S. D., Zloczower, I.M., and Hatsuo Ishida (1998). Influence of exothermic interaction on the morphology and droplet coalescence of melt-mixed immiscible polymer blends contain a block copolymer. Macromolecules, 31, 5383-5390.

Kumin, Y., and Han, C. D. (1996). Effect of shear flow and annealing on morphology of rapidly precipitated immiscible blends of PS/PI. Polymer, 36(26), 5795-5805.

Levitt, L., and Macosko, C. W. (1996). Influence of Normal stress difference on polymer drop deformation. Polymer Engineering and Science, 36 (12), 1647-1655.

Marh, J. E. (ed.) (1996). Physical properties of polymer handbook. New York: American Institute of Physics.

Mark, H. F., Bikales, N. M., Overberger, C. G., and Menges, G. (Eds.) (1986). Encyclopedia of polymer science and engineering vol.8 (pp. 254-276). New York: Wiley-Interscience.

Minale, M., Moldenaers, P., and Mawis, J. (1997). Effect of shear history on the morphology of immiscible polymer blends. Macromolecules, 30, 5470-5475.

Nakatani, A. I. (1996). Shear mixing/demixing of polymer blends. Ph.D. Thesis, University of Wisconsin, Madison, WI.

Nazir, A. M. (1998). Rheological properties and interfacial in polycarbonate/impact modifier blends: Effect of modifier shell molecular weight. Polymer Science: Part B: Polymer Physics, 36, 1095-1105.

Palierne, J. F. (1990). Linear rheology of viscoelastic emulsions with interfacial tension. Rheology Acta, 29, 204-214.

Sandararaj, U., and Macosko, C. W. (1995). Drop breakup and coalescence in polymer blends: The effects of concentration and compatibilization. Macromolecules, 28, 264-2657.

Schoolenberg, G. E., During, F., and Ingenbleck, G. (1998). Coalescence and interfacial tension measurements for polymer melts: experiment on a PS-PE model system. Polymer, 39(4), 765-772.

Shenoy, A. V., and Saini, D. R. (Eds.) (1996). Thermoplastic melt rheology and processing. New York: Marcel Dekker.

Smoluchowski, M. V., Physik, Z. (1916). Z. Physik Chemistry, 17, 557-585.

Stone, H. A., Bentley, B. J., and Leal, L. G. (1986). An experiment study of transient effects in the breakup of viscous drops. Fluid Mechanics., 173, 131-158.

Taylor, G. I. (1932). The viscosity of a fluid containing small drops of another fluid. Proc. R. Soc. London, A146, 41-49.

Utracki, L. A. (Ed.) (1989) Polymer alloys and blends: Thermodynamics and rheology. New York: Hanser.

Utracki, L. A. (Ed.) (1993). Two-phase polymer systems. New York: Hanser.

Utracki, L. A., and Sammut, P. (1988). Rheological of polystyrene /polyethylene blends. Polymer Engineering and Science. 28(21), 1405-1415.

Utracki, L.A., and Shi, Z. H. (1992). Development of polymer blend morphology during compounding in a twin-screw extruder: Part I: Droplet dispersion and coalescence-A Review. Polymer Engineering and Science, 32(24), 1824-1833.

Vinckier I. (1998). Microstructure analysis and rheology of immiscible polymer blends. Ph.D. Thesis, Department of chemical engineering, de Croylann, Belgium.

Vittorio, C., Blawzdziewicz, J., amd Loewenberg, M. (1998). Drop breakup in three-dimensional viscous flows. Physics Fluids, 10(8), 1781-1783.

Wensheng, B., and Jiasong, H. (1996). The effect of mixing time on the morphology of immiscible polymer blends. Applied Polymer Science, 62, 1445-1456.

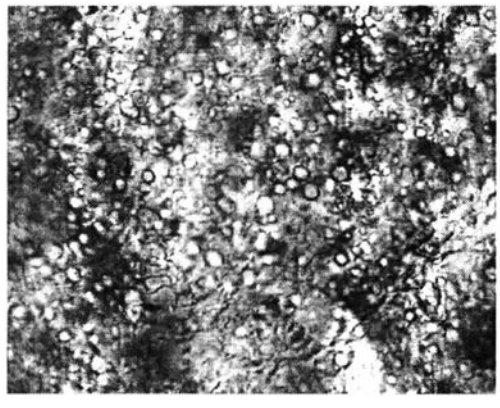
Wu, S. (1987). Formation of dispersed phase in incompatible polymer blends: Interfacial and rheological effects. Polymer Engineering and Science, 27(5), 335-343.

Zloczower, I. M., Tadmor, Z. (Eds.) (1994). Mixing and compounding of polymer. New York: Hanser.

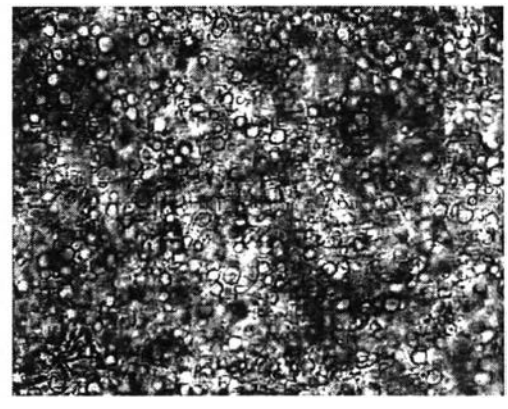
APPENDIX A

MICROGRAPHS OF THE BLENDS

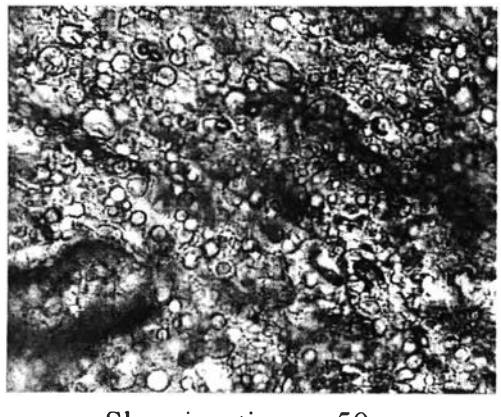
Figure A (1.1) The micrographs of the PS/PP blends of various shearing time at the shear strain rate of 1 s^{-1}, 200 °C. (Magnification: 400 times)



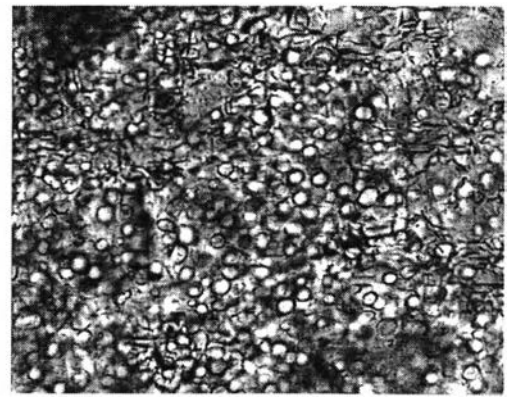
Initial micrograph from the brabender



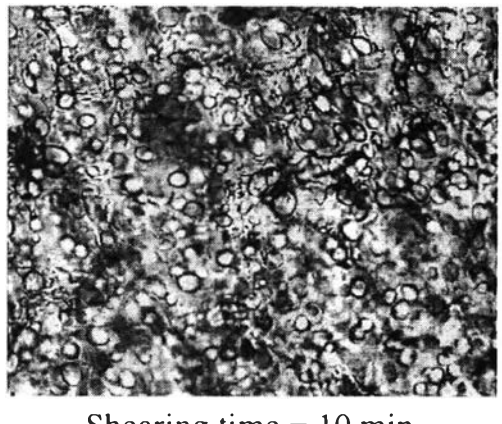
Shearing time = 5 s



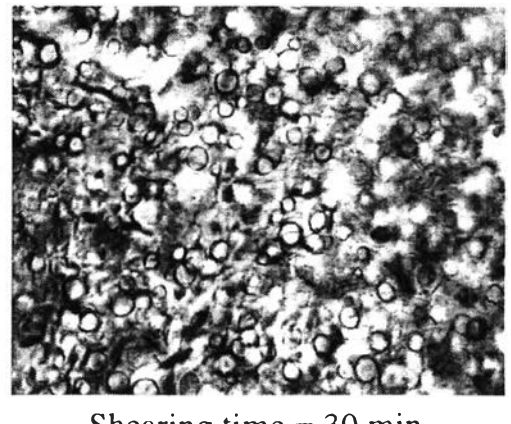
Shearing time = 50 s



Shearing time = 5 min

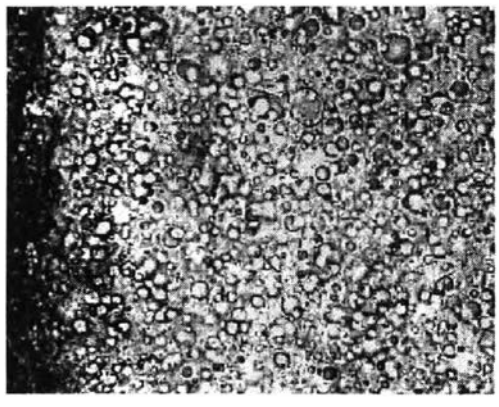


Shearing time = 10 min

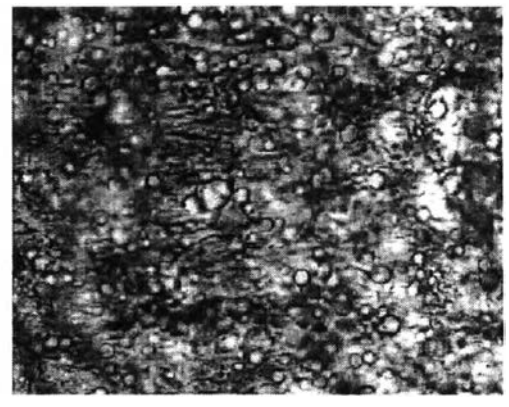


Shearing time = 30 min

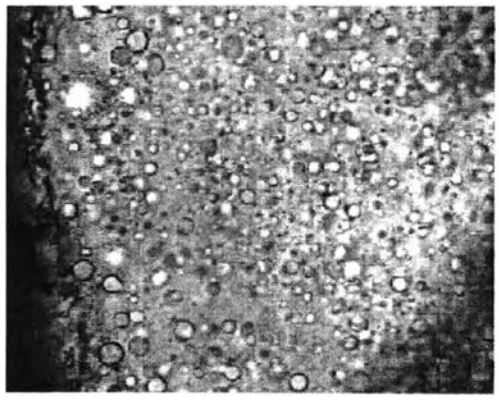
Figure A (1.2) The micrographs of the PS/PP blends of various shearing time at the shear strain rate of 10 s^{-1}, 200 °C. (Magnification: 400 times)



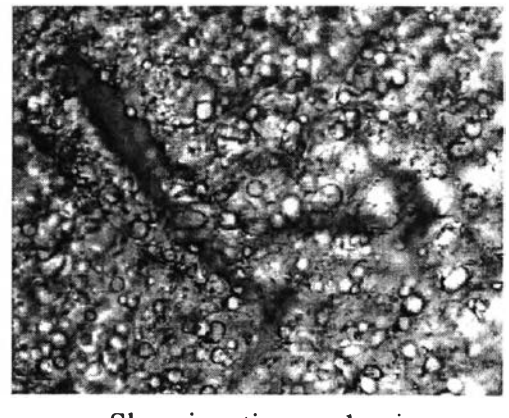
Shearing time = 3 s



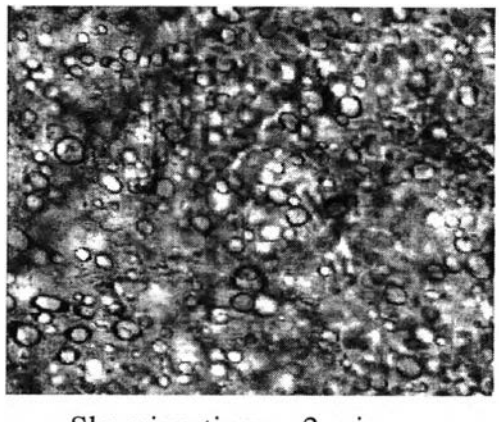
Shearing time = 10 s



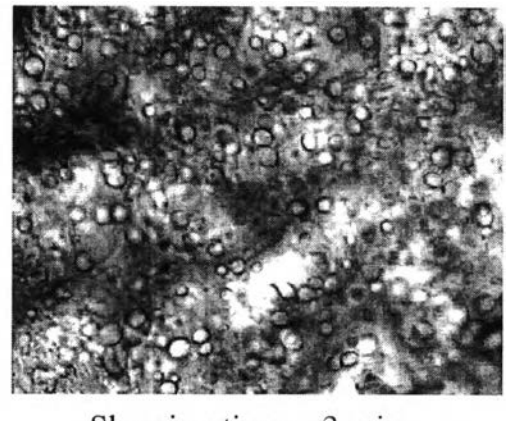
Shearing time = 20 s



Shearing time = 1 min

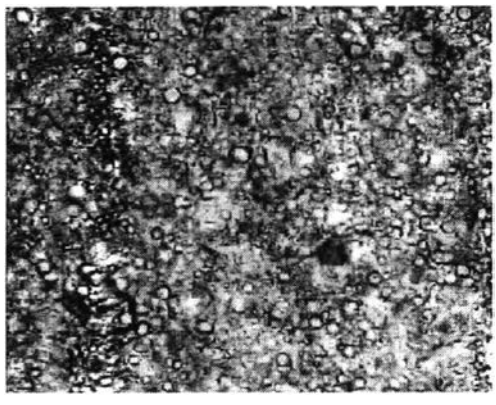


Shearing time = 2 min

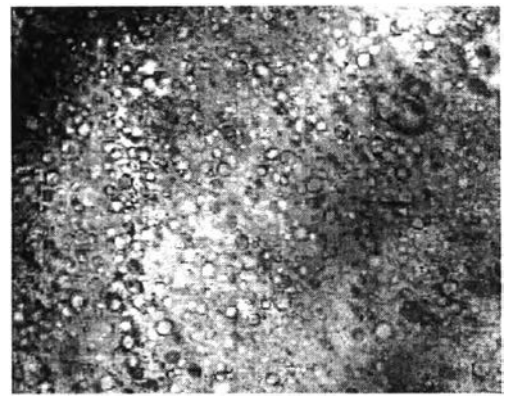


Shearing time = 3 min

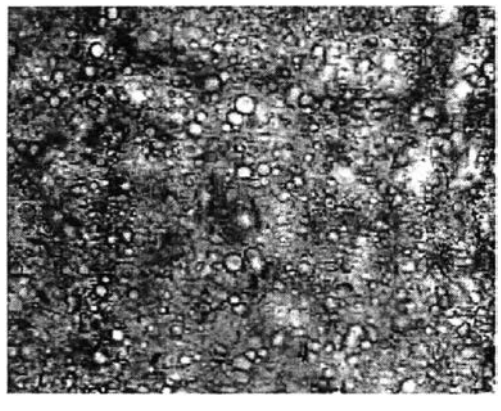
Figure A (1.3) The micrographs of the PS/PP blends of various shearing time at the shear strain rate of 100 s^{-1}, 200 °C. (Magnification: 400 times)



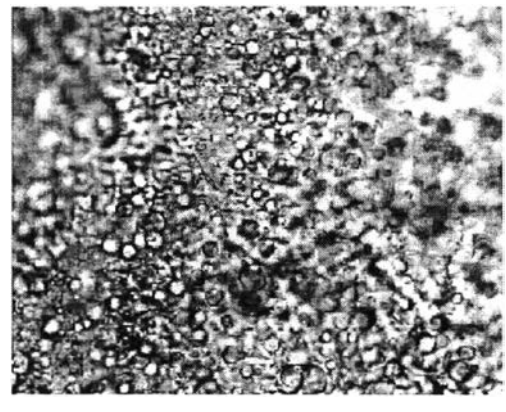
Shearing time = 3 s



Shearing time = 5 s

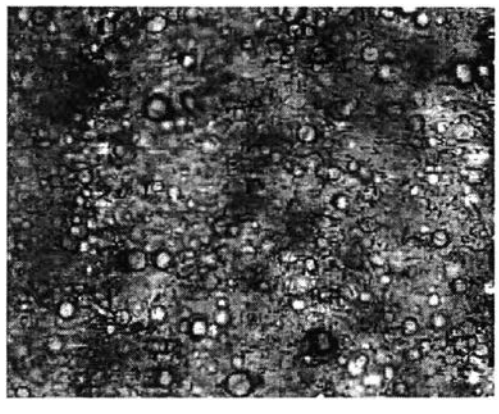


Shearing time = 20 s

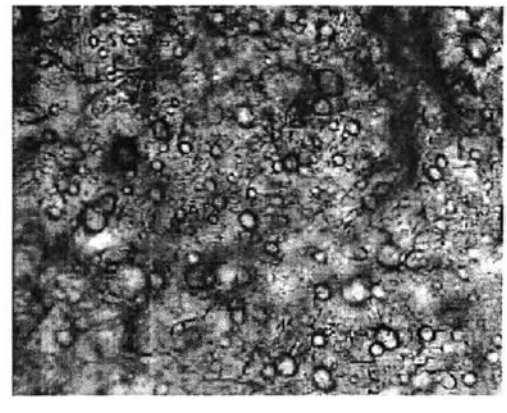


Shearing time = 1 min

Figure A (1.4) The micrographs of the PS/PP blends of various shearing time at the shear strain rate of 800 s^{-1}, 200 °C. (Magnification: 400 times)

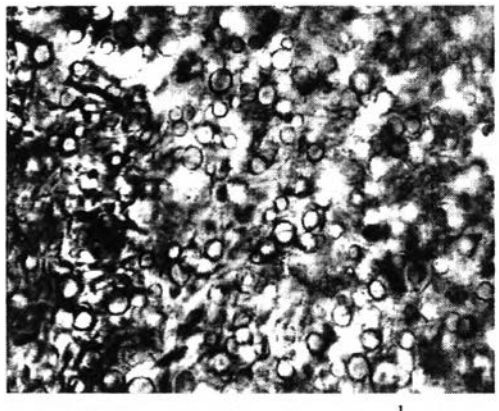


Shearing time = 15 s

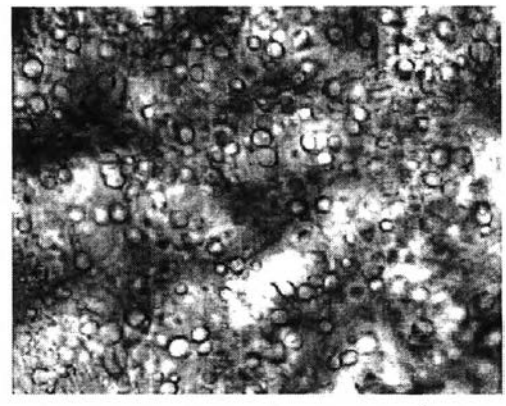


Shearing time = 1 min

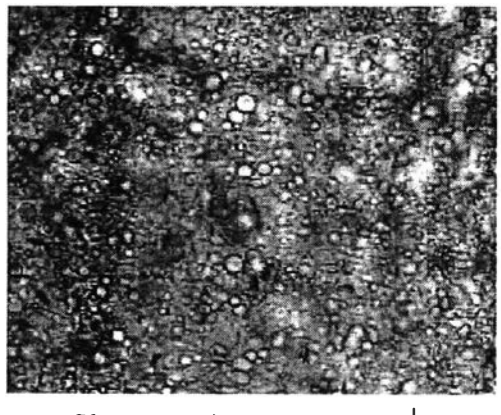
Figure A (2) The micrographs of the PS/PP blends of various shear strain rate at 200 °C. (Magnification: 400 times)



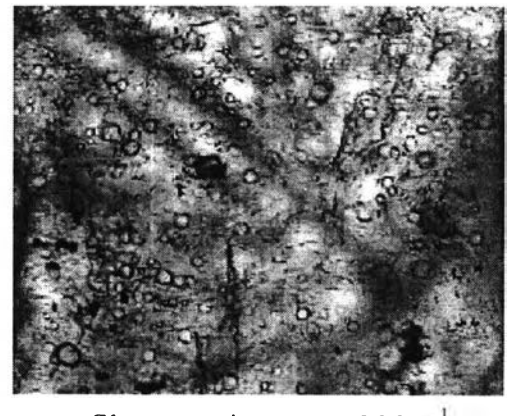
Shear strain rate = 1 s^{-1}



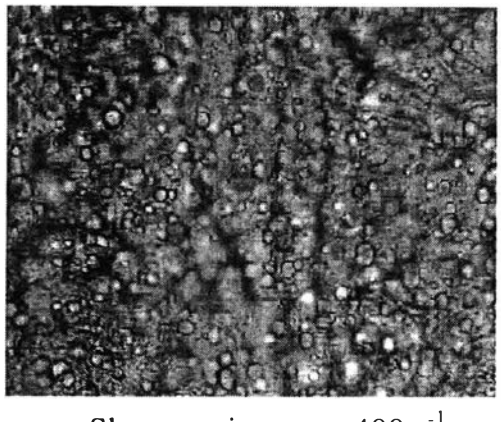
Shear strain rate = 10 s^{-1}



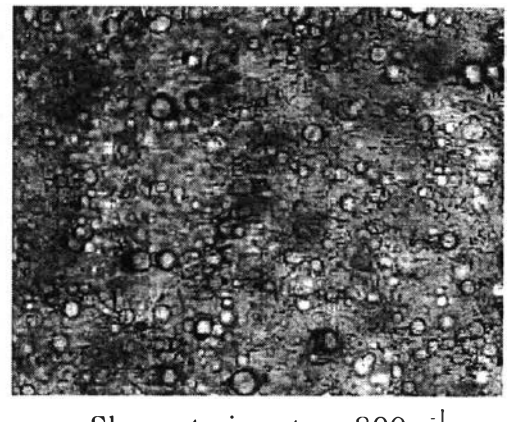
Shear strain rate =100 s^{-1}



Shear strain rate = 200 s^{-1}

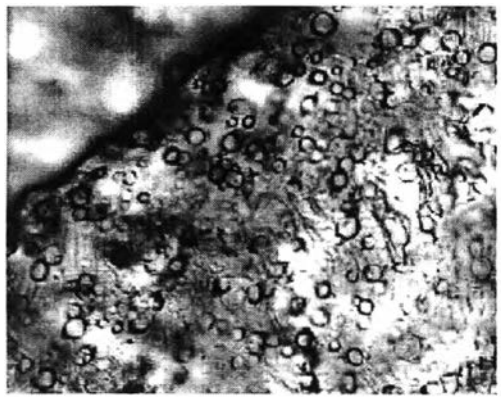


Shear strain rate = 400 s^{-1}

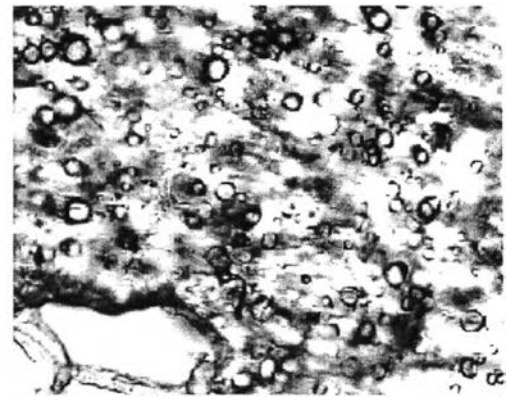


Shear strain rate = 800 s^{-1}

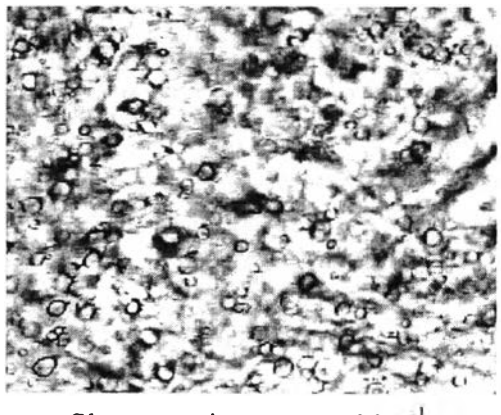
Figure A (3) The micrographs of the PS/HDPE blends of various shear strain rate at 200 °C. (Magnification: 400 times)



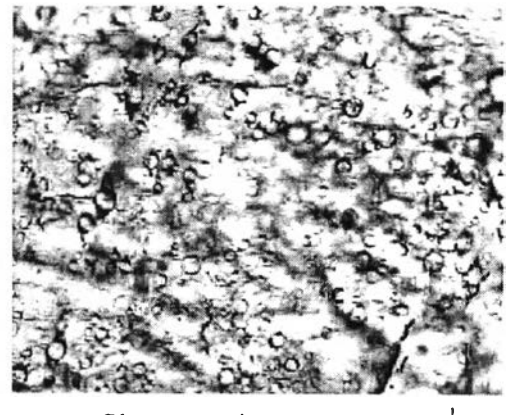
Shear strain rate = 1 s^{-1}



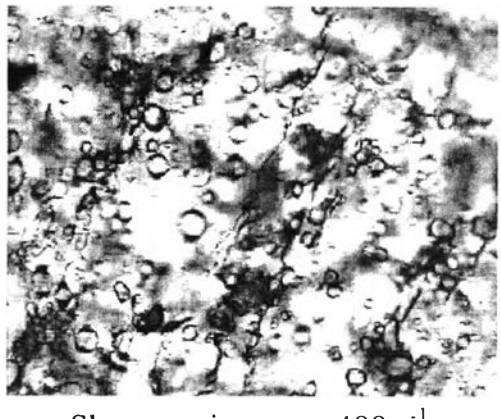
Shear strain rate = 10 s^{-1}



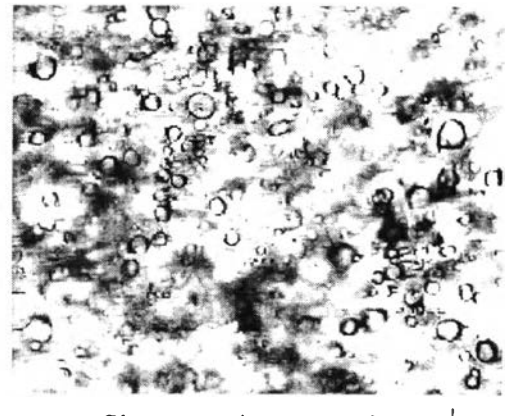
Shear strain rate = 100 s^{-1}



Shear strain rate = 200 s^{-1}

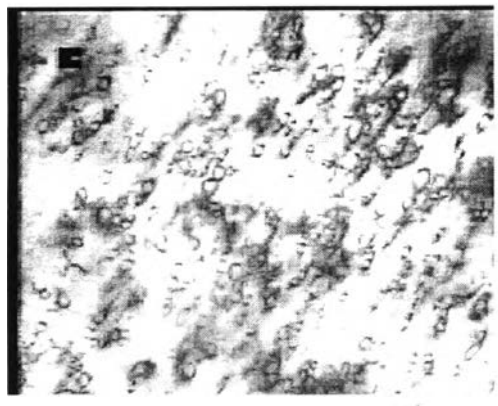


Shear strain rate = 400 s^{-1}

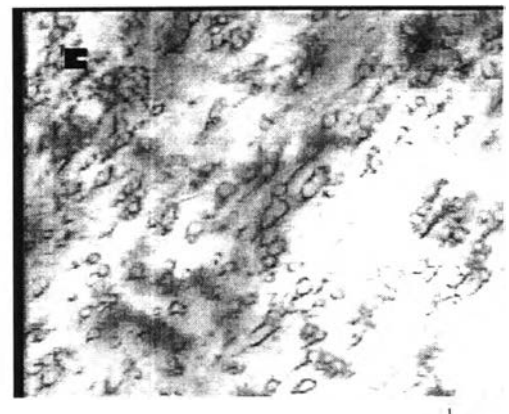


Shear strain rate = 800 s^{-1}

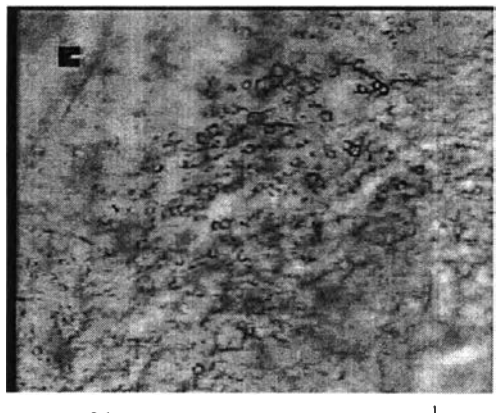
Figure A (4) The micrographs of the PMMA/HDPE blends of various shear strain rate at 200 °C. (Magnification: 500 times)



Shear strain rate = 1 s^{-1}

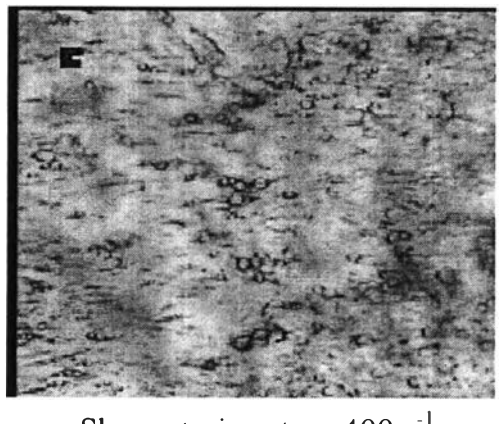


Shear strain rate = 10 s^{-1}

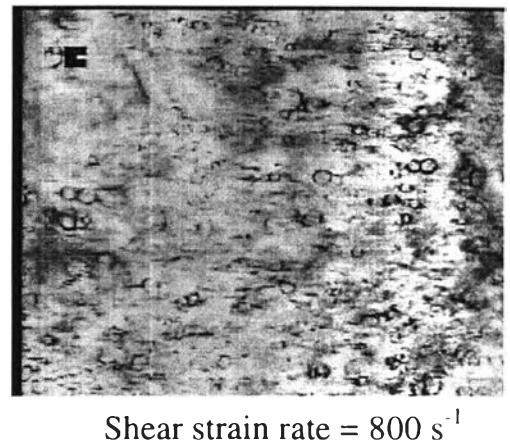


Shear strain rate = 100 s^{-1}

Shear strain rate = 200 s^{-1}



Shear strain rate = 400 s^{-1}



Shear strain rate = 800 s^{-1}

APPENDIX B

DROPLET SIZE DISTRIBUTION FUNCTIONS

Table B (1) Droplet size distribution functions for the PS/PP blends at the shear strain rate of 1 s^{-1}, 200 °C.

shearing time = 5 s		shearing time = 10 s		shearing time = 30 s		shearing time = 50 s		shearing time =1 min	
d	f(d)	d	f(d)	d	f(d)	d	f(d)	d	f(d)
1.8750	0.0000	1.8750	0.0000	2.1250	0.0000	1.8750	0.0000	2.1250	0.0000
2.1250	0.0084	2.1250	0.0042	2.3750	0.0435	2.1250	0.0085	2.3750	0.0521
2.5000	0.0837	2.3750	0.0336	3.1250	0.1498	2.3750	0.0213	3.1250	0.1146
3.1250	0.1632	3.1250	0.1555	3.8750	0.2609	2.6250	0.0128	3.8750	0.2049
3.8750	0.2301	4.0000	0.2566	4.3750	0.2271	3.1250	0.1319	4.3750	0.1597
4.3750	0.2218	4.3750	0.2227	5.1250	0.1739	3.8750	0.2043	5.1250	0.1944
5.1250	0.1339	5.1250	0.1807	5.6250	0.0918	4.3750	0.2213	5.6250	0.1354
5.6250	0.0837	5.6250	0.0925	6.3750	0.0193	5.1250	0.1660	6.3750	0.0556
6.3750	0.0418	6.3750	0.0294	6.8750	0.0145	5.6250	0.1064	6.8750	0.0347
6.8750	0.0209	6.8750	0.0084	8.1250	0.0097	6.3750	0.0766	7.6250	0.0243
7.6250	0.0042	7.6250	0.0042	8.3750	0.0000	7.6250	0.0170	8.1250	0.0069
8.1250	0.0042	8.1250	0.0042			8.1250	0.0085	8.8750	0.0069
8.3750	0.0000	8.3750	0.0000			8.8750	0.0043	9.1250	0.0000

shearing time=5 min		shearing time=10 min		shearing time=20 min		shearing time=30 min	
d	f(d)	d	f(d)	d	f(d)	d	f(d)
2.1250	0.0000	2.8750	0.0000	2.8750	0.0000	3.6750	0.0000
2.3750	0.0079	3.1250	0.0042	3.8750	0.0042	3.8750	0.0045
3.1250	0.0276	3.8750	0.0211	4.3750	0.0167	4.3750	0.0179
3.8750	0.0827	4.3750	0.0675	5.1250	0.0753	5.1250	0.0759
4.3750	0.2126	5.1250	0.1350	5.6250	0.1046	5.6250	0.1116
5.1250	0.2283	5.6250	0.2068	6.3750	0.1423	6.3750	0.1518
5.6250	0.1575	6.3750	0.2110	6.8750	0.2134	7.0000	0.1759
6.3750	0.1181	6.8750	0.1435	7.6250	0.1506	7.6250	0.1518
6.8750	0.0591	7.6250	0.0928	8.1250	0.0921	8.2500	0.0893
7.6250	0.0354	8.1250	0.0549	8.8750	0.0711	8.8750	0.0759
8.1250	0.0197	8.8750	0.0169	9.3750	0.0460	9.3750	0.0492
8.8750	0.0079	9.3750	0.0084	10.6250	0.0293	10.6250	0.0268
9.8750	0.0039	9.8750	0.0042	11.1250	0.0126	11.1250	0.0134
10.1250	0.0000	10.1250	0.0042	11.3750	0.0126	11.3750	0.0134
		10.3750	0.0000	11.6250	0.0000		

Table B (2) Droplet size distribution functions for the PS/PP blends at the shear strain rate of 10 s^{-1}, 200 °C.

shearing time = 3 s		shearing time = 5 s		shearing time = 8 s		shearing time = 10 s		shearing time = 20 s	
d	f(d)	d	f(d)	d	f(d)	d	f(d)	d	f(d)
2.1250	0.0000	2.1250	0.0000	2.1250	0.0000	2.1250	0.0000	2.1250	0.0000
2.3750	0.0754	2.3750	0.0298	2.3750	0.0375	2.3750	0.0090	2.5200	0.0601
3.1250	0.1548	3.1250	0.1523	3.1250	0.1667	3.1250	0.0679	3.1250	0.1138
3.8750	0.2143	3.8750	0.2483	3.8750	0.2292	3.8750	0.2172	3.8750	0.1793
4.3750	0.2421	4.3750	0.2517	4.3750	0.2333	4.3750	0.2172	4.3750	0.1379
5.1250	0.1508	5.3600	0.1430	5.1250	0.1375	5.1250	0.1493	5.1250	0.1655
5.6250	0.0833	5.6250	0.0861	5.6250	0.1250	5.6250	0.1448	5.6250	0.1414
6.3750	0.0437	6.3750	0.0550	6.3750	0.0417	6.3750	0.0633	6.3750	0.0655
6.8750	0.0159	6.8750	0.0220	6.8750	0.0083	6.8750	0.0814	6.8750	0.0552
7.6250	0.0119	7.6250	0.0066	7.6250	0.0125	7.6250	0.0317	7.6250	0.0345
8.1250	0.0079	7.8750	0.0030	8.6250	0.0000	8.1250	0.0181	8.1250	0.0207
8.3750	0.0000	8.1250	0.0000			8.3750	0.0000	8.8750	0.0172
								9.3750	0.0035
								11.1250	0.0034
								12.0000	0.0000

shearing time = 30 s		shearing time = 1 min		shearing time = 2 min		shearing time = 3 min		shearing time = 5 min	
d	f(d)	d	f(d)	d	f(d)	d	f(d)	d	f(d)
2.1250	0.0000	2.8750	0.0000	2.8750	0.0000	2.8750	0.0000	2.8750	0.0000
2.3750	0.0039	3.1250	0.0184	3.1250	0.0043	3.1250	0.0049	3.1200	0.0079
3.1250	0.0311	3.8750	0.0553	3.8750	0.0736	3.8750	0.0300	3.8750	0.0748
3.8750	0.1178	4.3750	0.1751	4.3750	0.1255	4.3750	0.0800	4.3750	0.1181
4.4500	0.2050	5.1250	0.2304	5.1250	0.2078	5.1250	0.1471	5.1250	0.1457
5.1250	0.2230	5.6250	0.1935	5.6250	0.1861	5.6250	0.2401	5.6250	0.1575
5.6250	0.1607	6.3750	0.1290	6.3750	0.1299	6.3750	0.1910	6.3750	0.1496
6.3750	0.1206	6.8750	0.0783	6.8750	0.0866	6.8750	0.1420	6.8750	0.1260
7.0000	0.0640	7.6250	0.0599	7.6250	0.0563	8.1250	0.0600	7.6250	0.0945
7.6250	0.0389	8.1250	0.0323	8.1250	0.0390	8.8750	0.0200	8.1250	0.0591
8.5000	0.0156	8.8750	0.0138	8.8750	0.0216	10.1250	0.0150	8.8750	0.0315
9.3750	0.0078	9.3750	0.0138	9.3750	0.0043	10.6250	0.0050	9.6000	0.0157
10.1250	0.0039	10.1250	0.0046	9.6250	0.0043	10.8750	0.0000	10.1250	0.0118
10.3750	0.0000	10.3750	0.0000	10.6250	0.0043			10.6250	0.0039
				10.8750	0.0000			10.8750	0.0000

Table B (3) Droplet size distribution functions for the PS/PP blends at the shear strain rates of 100 s^{-1}, 200 °C.

shearing time = 3 s		shearing time = 5 s		shearing time = 10 s		shearing time = 20 s		shearing time = 60 s	
d	f(d)	d	f(d)	d	f(d)	d	f(d)	d	f(d)
2.1250	0.0000	2.1250	0.0000	2.1250	0.0000	2.1250	0.0000	2.1250	0.0000
2.3750	0.0383	2.3750	0.0446	2.3750	0.0183	2.3750	0.0466	2.3750	0.0118
3.1250	0.1770	3.1250	0.1875	3.1250	0.1507	3.1250	0.1992	3.1250	0.1417
3.8750	0.2775	3.8250	0.2679	3.8250	0.3014	3.8750	0.2669	3.8750	0.3268
4.3250	0.2775	4.3750	0.2768	4.3750	0.2740	4.3750	0.2288	4.3750	0.3031
5.1250	0.1388	5.1250	0.1384	5.1250	0.1689	5.1250	0.1356	5.1250	0.1299
5.6250	0.0478	5.6250	0.0357	6.0000	0.0593	5.6250	0.0678	5.6250	0.0512
6.3750	0.0335	6.3750	0.0268	6.8750	0.0183	6.3750	0.0381	6.3750	0.0197
6.8750	0.0048	6.8750	0.0089	7.6250	0.0046	6.8750	0.0082	6.8750	0.0079
8.1250	0.0048	7.6250	0.0045	8.1250	0.0000	7.6250	0.0076	7.6250	0.0039
8.3750	0.0000	7.8250	0.0000			7.8750	0.0000	8.1250	0.0039
								8.3750	0.0000

Table B (4) Droplet size distribution functions for the PS/PP blends at the shear strain rates of 800 s^{-1}, 200 °C.

shearing time = 4 s		shearing time = 15 s		shearing time = 60 s	
d	f(d)	d	f(d)	d	f(d)
2.1250	0.0000	2.1250	0.0000	2.1250	0.0000
2.3750	0.0669	2.3750	0.0660	2.3750	0.0647
3.1250	0.1632	3.1250	0.1269	3.1250	0.1511
3.8750	0.2427	3.8250	0.1929	3.8750	0.2122
4.3250	0.1841	4.3750	0.2284	4.3750	0.1978
5.1250	0.1172	5.1250	0.1726	5.1250	0.1403
5.6250	0.0879	5.6250	0.0761	5.6250	0.1007
6.3750	0.0711	6.3750	0.0558	6.3750	0.0647
7.6250	0.0293	6.8750	0.0355	6.8750	0.0324
8.1250	0.0042	7.6250	0.0254	7.6250	0.0144
8.3750	0.0000	8.1250	0.0152	8.1250	0.0107
		8.8750	0.0081	8.3750	0.0107
		9.1250	0.0000	8.6250	0.0000

Table B (5) Droplet size distribution functions for the PS/PP blends at various shear strain rates, 200 °C.

Initial drop size		$\dot{\gamma}$ = 1		$\dot{\gamma}$ = 10		$\dot{\gamma}$ = 100		$\dot{\gamma}$ = 200		$\dot{\gamma}$ = 400		$\dot{\gamma}$ = 800	
d	f(d)	d	f(d)	d	f(d)	d	f(d)	d	f(d)	d	f(d)	d	f(d)
2.375	0.060	3.875	0.004	3.125	0.005	2.375	0.012	2.375	0.140	2.375	0.102	2.375	0.065
3.125	0.269	4.375	0.017	3.875	0.029	3.125	0.142	3.125	0.274	3.125	0.223	3.125	0.151
3.875	0.293	5.125	0.075	4.375	0.083	3.875	0.327	3.875	0.344	3.875	0.234	3.875	0.212
4.375	0.234	5.625	0.104	5.125	0.146	4.375	0.303	4.375	0.149	4.375	0.193	4.375	0.198
5.125	0.072	6.375	0.133	5.625	0.239	5.125	0.130	5.125	0.047	5.125	0.127	5.125	0.140
5.625	0.036	7.000	0.213	6.375	0.190	5.625	0.051	5.625	0.023	5.625	0.076	5.625	0.101
6.875	0.012	7.750	0.158	6.875	0.141	6.375	0.020	6.375	0.013	6.375	0.036	6.375	0.065
7.625	0.000	8.250	0.092	7.625	0.063	6.875	0.008	6.875	0.004	6.875	0.005	6.875	0.032
8.125	0.000	8.875	0.071	8.125	0.059	7.625	0.004	7.625	0.000	7.000	0.000	7.625	0.014
		9.250	0.046	9.000	0.024	8.125	0.004	7.875	0.000			8.125	0.011
		10.625	0.029	10.125	0.015	8.375	0.000					8.875	0.011
		11.125	0.013	10.625	0.005	8.625	0.000					9.125	0.000
		11.375	0.013	10.875	0.000								

Table B (6) Droplet size distribution functions for the PS/HDPE blends at various shear strain rates, 200 °C.

Initial drop size		$\dot{\gamma}$ = 1		$\dot{\gamma}$ = 10		$\dot{\gamma}$ = 100		$\dot{\gamma}$ = 200		$\dot{\gamma}$ = 400		$\dot{\gamma}$ = 800	
d	f(d)	d	f(d)	d	f(d)	d	f(d)	d	f(d)	d	f(d)	d	f(d)
3.125	0.045	3.875	0.004	3.125	0.000	3.125	0.041	2.375	0.009	2.375	0.009	2.375	0.006
3.875	0.169	4.375	0.056	3.875	0.062	3.875	0.104	3.125	0.069	3.125	0.037	3.125	0.033
4.375	0.236	5.125	0.092	4.375	0.095	4.375	0.195	3.875	0.193	3.875	0.128	3.875	0.103
5.125	0.194	5.790	0.134	5.125	0.176	5.125	0.208	4.375	0.259	4.375	0.177	4.375	0.131
5.625	0.145	6.375	0.151	5.625	0.212	5.625	0.195	5.125	0.196	5.125	0.220	5.125	0.198
6.375	0.074	6.875	0.176	6.375	0.157	6.375	0.113	5.625	0.109	5.625	0.155	5.625	0.152
6.875	0.045	7.625	0.113	6.875	0.127	6.875	0.069	6.375	0.078	6.375	0.104	6.375	0.119
7.625	0.041	8.125	0.092	7.625	0.065	7.625	0.047	6.875	0.056	6.875	0.064	6.875	0.091
8.125	0.021	8.875	0.077	8.125	0.039	8.125	0.013	7.625	0.016	7.625	0.043	8.125	0.055
8.875	0.012	9.375	0.070	8.875	0.029	8.875	0.006	8.125	0.013	8.125	0.030	8.875	0.039
9.125	0.000	10.625	0.011	9.375	0.016	9.375	0.003	8.375	0.003	8.875	0.012	9.375	0.018
		11.125	0.004	11.125	0.003	9.625	0.000	8.625	0.000	10.125	0.006	10.375	0.009
		11.375	0.004	11.375	0.003					10.375	0.000	10.500	0.000

Table B (7) Droplet size distribution functions for the PMMA/HDPE blends at various shear strain rates, 200 °C.

Initial drop size		$\dot{\gamma}$ = 1		$\dot{\gamma}$ = 10		$\dot{\gamma}$ = 100		$\dot{\gamma}$ = 200		$\dot{\gamma}$ = 400		$\dot{\gamma}$ = 800	
d	f(d)	d	f(d)	d	f(d)	d	f(d)	d	f(d)	d	f(d)	d	f(d)
1.875	0.000	1.875	0.000	2.125	0.034	1.875	0.000	1.875	0.000	1.875	0.000	1.875	0.000
2.125	0.250	2.125	0.016	2.375	0.194	2.125	0.115	2.125	0.364	2.125	0.004	2.125	0.021
2.375	0.355	2.375	0.189	3.125	0.396	2.500	0.430	2.375	0.422	2.375	0.159	2.375	0.159
3.125	0.293	3.125	0.381	3.625	0.257	3.125	0.340	3.125	0.184	3.125	0.339	3.125	0.288
3.625	0.066	3.625	0.266	4.125	0.086	3.625	0.094	3.625	0.019	3.625	0.335	3.625	0.270
4.125	0.016	4.125	0.131	4.625	0.019	4.125	0.013	4.125	0.005	4.125	0.133	4.125	0.167
4.625	0.008	4.625	0.008	4.875	0.004	4.625	0.009	4.375	0.000	4.625	0.030	4.625	0.060
4.875	0.000	5.125	0.004	5.125	0.004	4.875	0.000			4.875	0.000	5.125	0.021
		5.375	0.000	5.625	0.004							5.375	0.000

Figure B (1) Distribution function of droplet size for the PS/PP blends as a function of shearing time at shear strain rate of 1 s^{-1}.

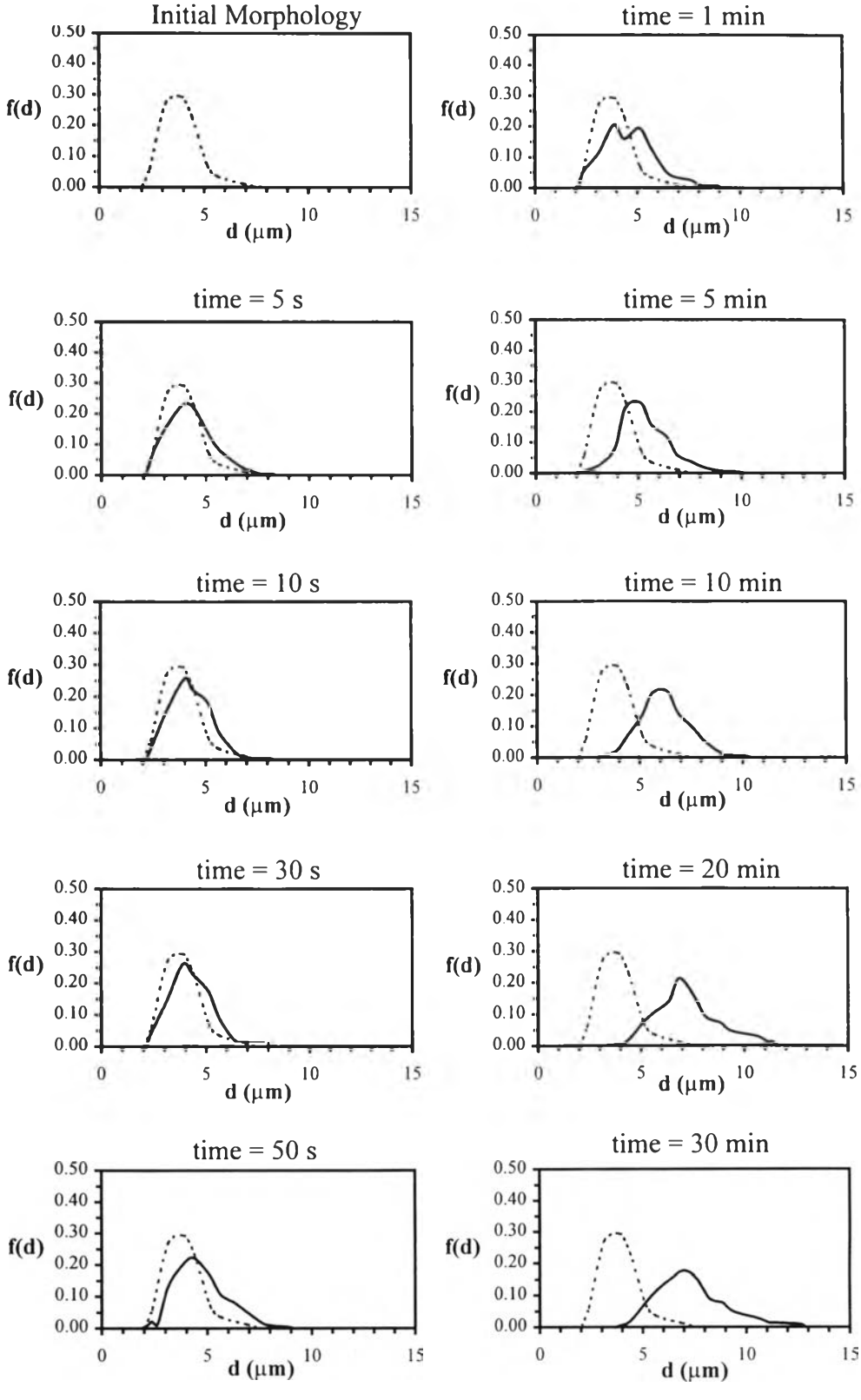


Figure B (2) Distribution function of droplet size of the PS/PP blends as a function of shearing time at the shear strain rate of 10 s^{-1}.

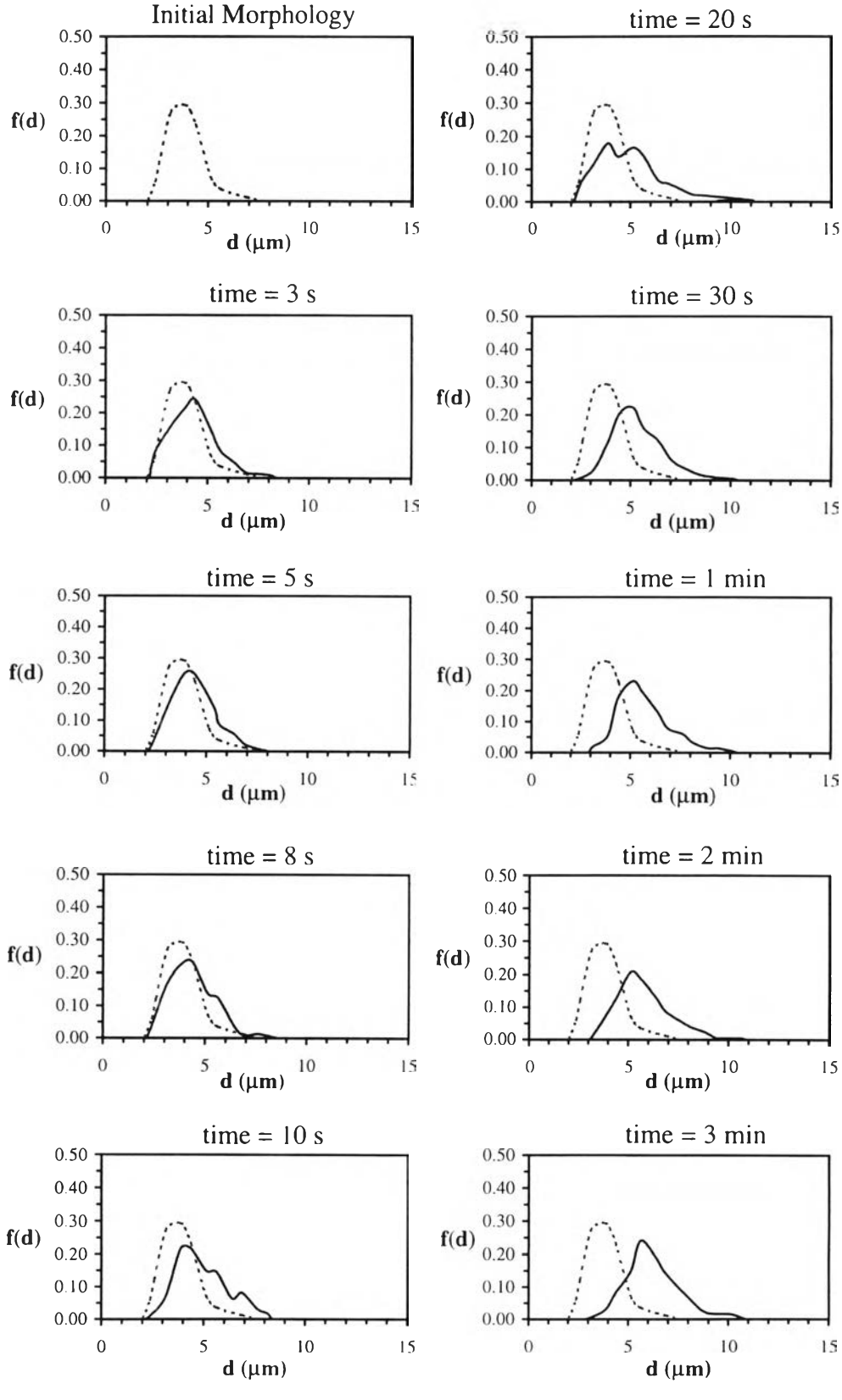


Figure B (3) Distribution function of droplet size of the PS/PP blends as a function shearing time at the shear strain rate of 100 s^{-1}.

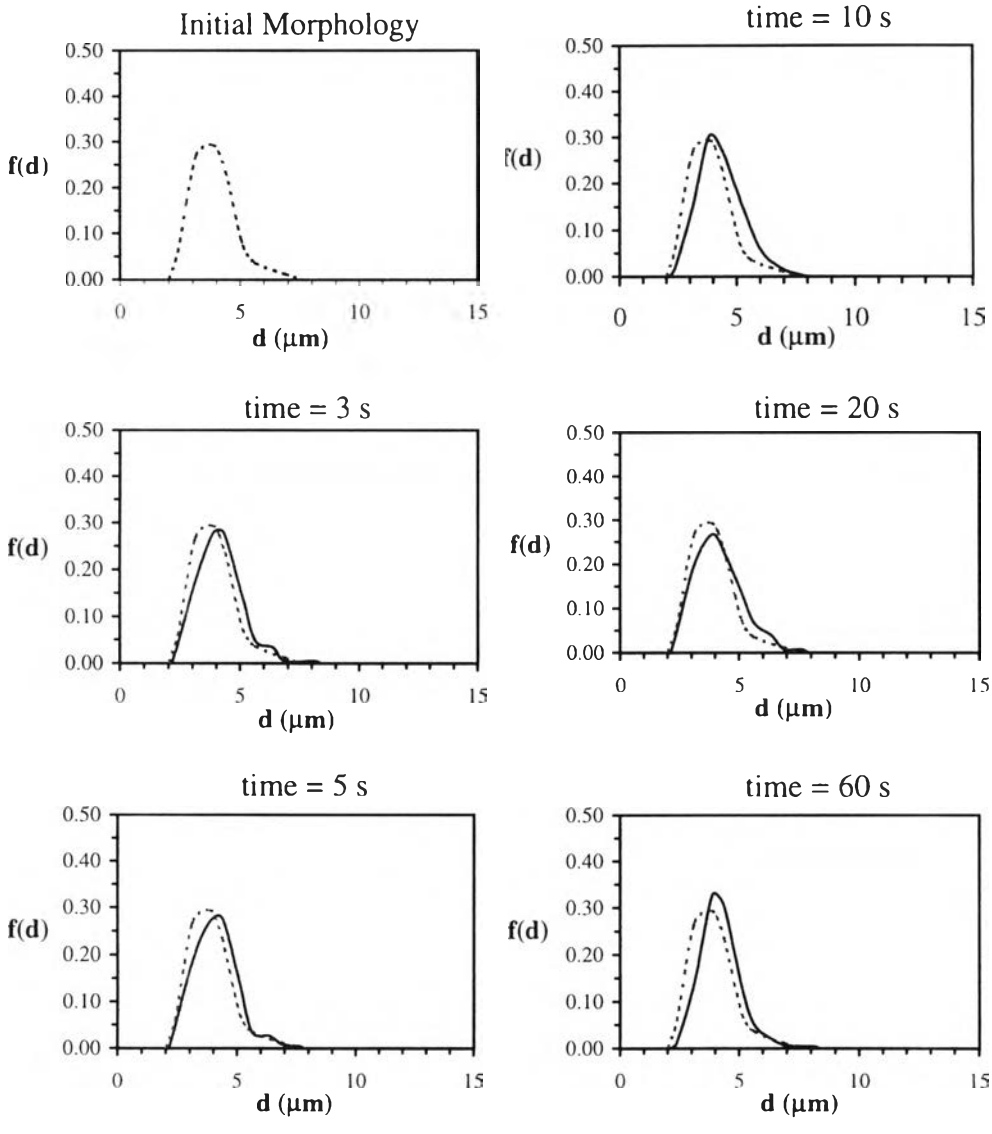


Figure B (4) Distribution function of droplet size of the PS/PP blends as a function of shearing time at the shear strain rate of 800 s^{-1}.

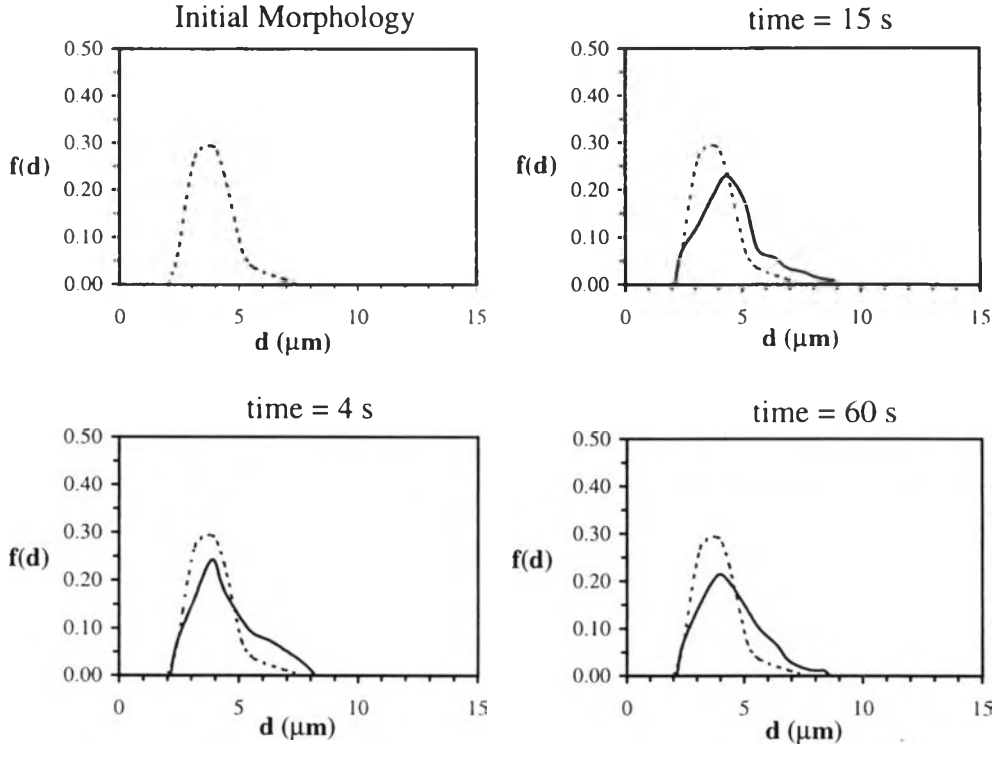
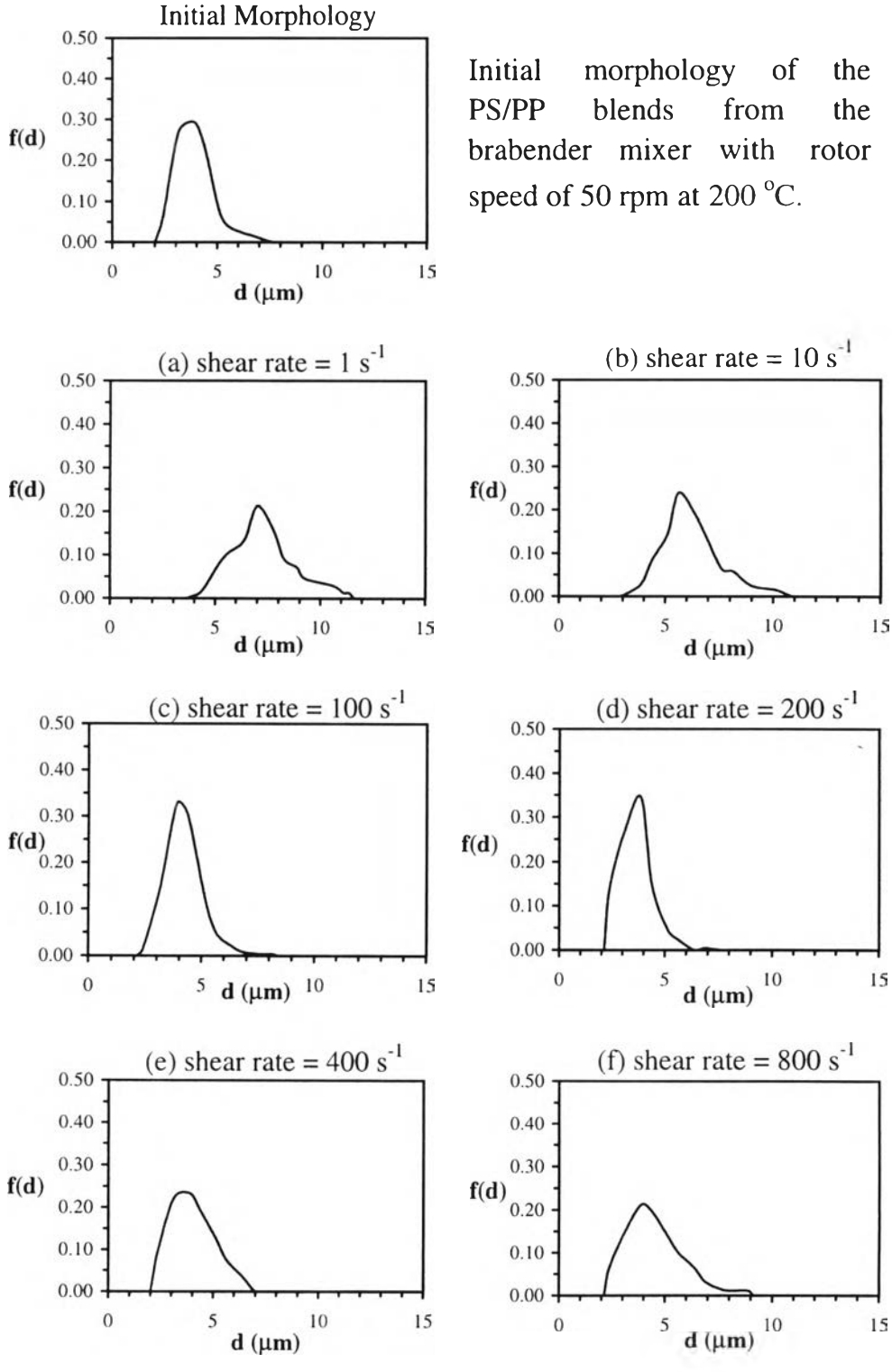
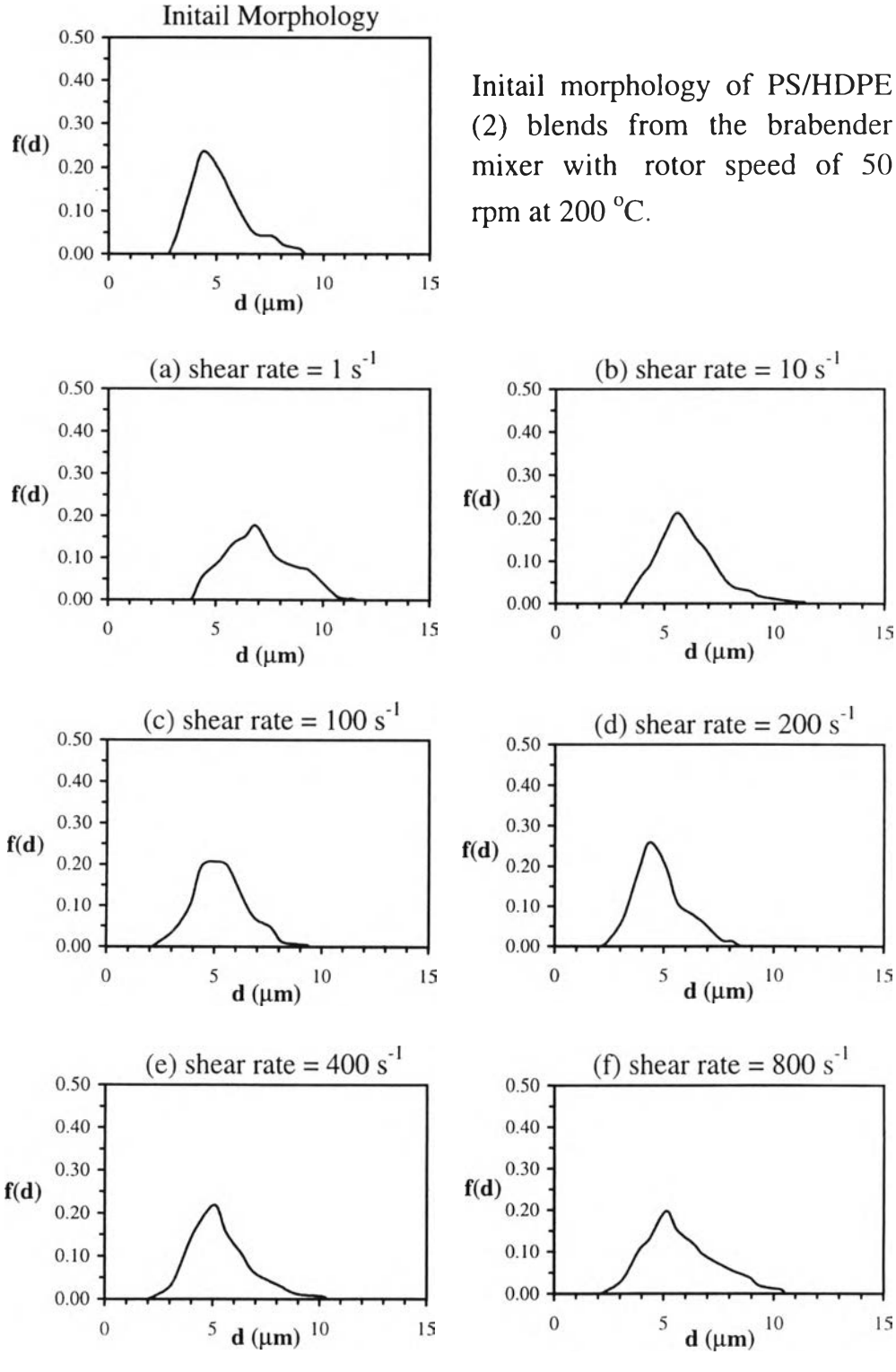


Figure B (5) Distribution function of droplet size of the PS/PP blends as a function of shear strain rate at 200 °C.



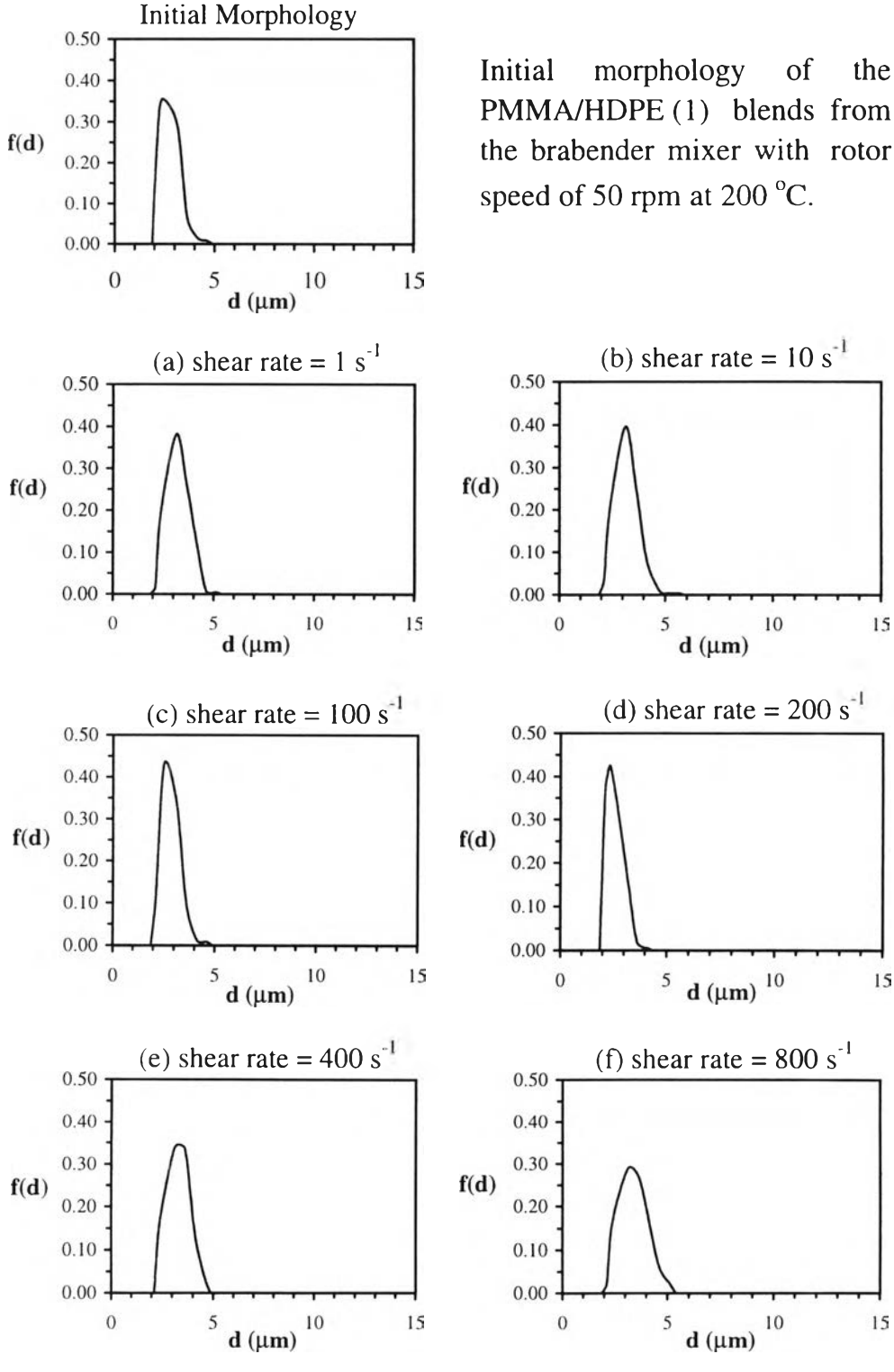
Initial morphology of the PS/PP blends from the brabender mixer with rotor speed of 50 rpm at 200 °C.

Figure B (6) Distribution function of droplet size of the PS/HDPE(2) blends as a funtion of shear strain rate at 200°C.



Initail morphology of PS/HDPE (2) blends from the brabender mixer with rotor speed of 50 rpm at 200 °C.

Figure B (7) Distribution function of droplet size of the PMMA/HDPE(1) blends as a function of shear strain rate at 200°C.



APPENDIX C

THE HYSTERESIS DATA

Table C (1) The equilibrium droplet size of the PS/PP blends, blending with rotor speed of 10 rpm at 200 °C, at various shear strain rates and at 200 °C.

Ensemble average	Initial size	Shear strain rate (1/s)						
		1	10	25	100	200	400	800
Average (μm)	4.99	10.72	8.23	5.78	4.77	3.78	4.59	4.93
STD	1.28	2.69	2.60	1.60	1.24	1.08	1.19	1.24
maximum	11.38	18.39	18.39	14.57	10.14	8.19	10.73	9.42
minimum	2.49	5.70	3.05	2.49	2.49	2.49	2.49	2.49

Table C (2) The equilibrium droplet size of the PS/PP blends, blending with rotor speed of 50 rpm at 200 °C, at various shear strain rates and at 200 °C.

Ensemble average	Initial size	Shear strain rate (1/s)						
		1	10	25	100	200	400	800
Average (μm)	3.87	7.19	6.15	5.76	4.23	3.66	4.03	4.51
STD	0.87	1.29	1.59	1.53	0.86	0.85	1.03	1.32
maximum	6.93	11.38	10.73	11.58	8.19	6.93	6.93	8.86
minimum	2.49	3.80	2.49	2.49	2.49	2.49	2.49	2.49

APPENDIX D

THE CAPILLARY NUMBER, VISCOSITY RATIO, AND NORMAL STRESS RATIO DATA

Table D (1) The dimensionless parameters for the PS/PP blends at 200°C.

$\dot{\gamma}$ (1/sec)	D (μm)	Ca			η_d (P)	η_m (P)	η_r	N_d (dyn/cm^2)	N_m (dyn/cm^2)	N_d/N_m	N'_d at τ (dyn/cm^2)	N'_d/N_m
		experiment	Taylor	Wu								
25	5.78 ± 1.59	6.01 ± 1.66	0.89	7.66	9.00E+03	4.15E+03	2.17	6.00E+05	2.00E+05	3.00	5.00E+05	2.50
100	4.23 ± 0.86	6.15 ± 1.26	0.89	7.78	3.20E+03	1.45E+03	2.21	1.50E+06	4.80E+05	3.13	1.40E+06	2.92
200	3.57 ± 0.85	7.51 ± 1.89	0.89	7.73	2.30E+03	1.05E+03	2.19	2.50E+06	7.00E+05	3.57	2.40E+06	3.43
400	4.05 ± 1.03	10.06 ± 2.56	0.88	8.64	1.55E+03	6.20E+02	2.50	4.80E+06	1.00E+06	4.80	4.00E+06	4.00
800	4.43 ± 1.32	13.49 ± 4.04	0.88	9.02	1.00E+03	3.80E+02	2.63	7.00E+06	1.30E+06	5.38	5.89E+06	4.53

Table D (2) The dimensionless parameters for the PS/HDPE(2) blends at 200°C.

$\dot{\gamma}$ (1/sec)	D (μm)	Ca			η_d (P)	η_m (P)	η_r	N_d (dyn/cm^2)	N_m (dyn/cm^2)	N_d/N_m	N'_d at τ (dyn/cm^2)	N'_d/N_m
		experment	Taylor	Wu								
100	5.31 ± 1.19	7.92 ± 1.77	0.89	7.69	3.20E+03	1.47E+03	2.18	1.50E+06	3.00E+05	5.00	1.20E+06	4.00
200	4.84 ± 1.15	9.49 ± 2.12	0.88	8.28	2.30E+03	9.67E+02	2.38	2.50E+06	4.50E+05	5.56	2.00E+06	4.44
400	5.35 ± 1.37	14.11 ± 3.62	0.88	8.30	1.55E+03	6.50E+02	2.38	4.80E+06	6.80E+05	7.06	3.30E+06	4.85
800	5.73 ± 1.58	18.60 ± 5.15	0.88	8.64	1.00E+03	4.00E+02	2.50	7.00E+06	9.00E+05	7.78	5.00E+06	5.56

Table D (3) The dimensionless parameters for the PMMA/HDPE(1) blends at 200°C.

$\dot{\gamma}$ (1/sec)	D (μm)	Ca			η_d (P)	η_m (P)	η_r	N_d (dyn/cm^2)	N_m (dyn/cm^2)	N_d/N_m	N'_d at τ (dyn/cm^2)	N'_d/N_m
		experiment	Taylor	Wu								
100	2.79 ± 0.49	5.10 ± 0.91	0.91	4.82	4.00E+03	3.20E+03	1.25	1.40E+06	8.00E+05	1.75	1.40E+06	1.75
200	3.46 ± 0.43	7.90 ± 1.01	0.90	5.31	2.80E+03	2.00E+03	1.40	2.60E+06	1.10E+06	2.36	2.60E+06	2.36
400	3.34 ± 0.54	6.86 ± 1.12	0.89	6.82	1.70E+03	9.00E+02	1.89	4.00E+06	1.20E+06	3.33	4.00E+06	3.33
800	3.41 ± 0.67	7.47 ± 1.51	0.89	6.91	9.20E+02	4.80E+02	1.92	5.00E+06	1.40E+06	3.57	4.80E+06	3.43

APPENDIX E

THE FIRST NORMAL STRESS DIFFERENCES OF PS AND PMMA AS A FUNCTION OF SHEAR STRESS OF THE MATRIX PHASES

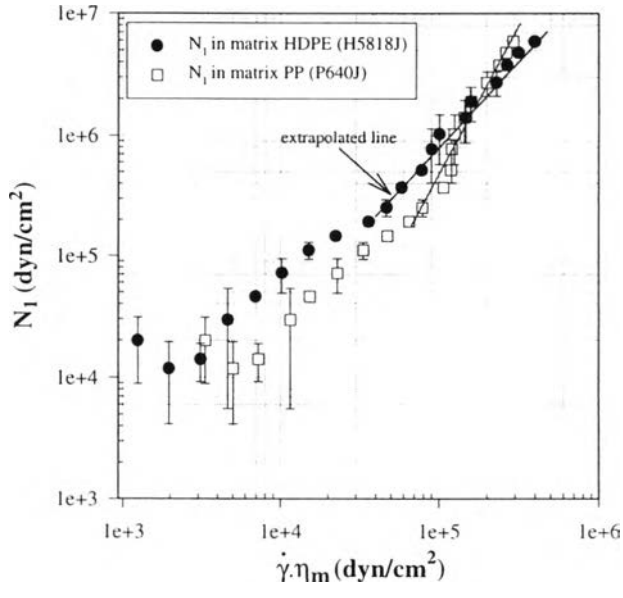


Figure E (1) The first normal stress difference N_1 of PS as a function of shear stress of PP and HDPE(2) at 200 °C.

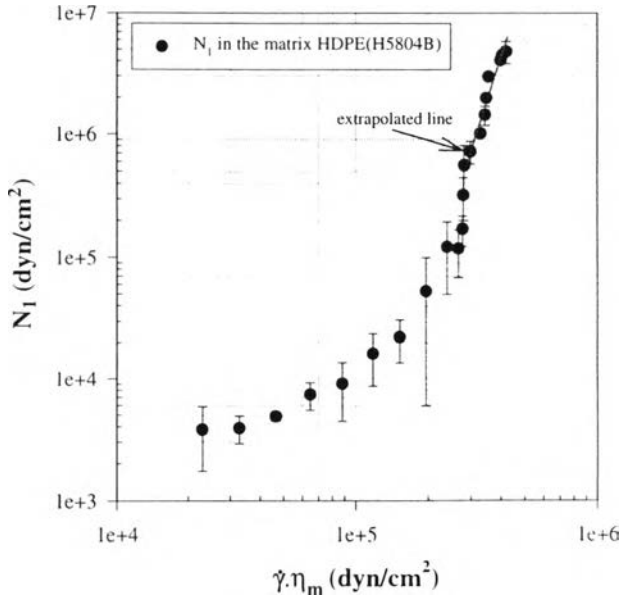


Figure E (2) The first normal stress difference N_1 of PMMA as a function of shear stress of HDPE(1) at 200 °C.

APPENDIX F

THE RHEOLOGY CHARACTERIZATIONS

Table F (1) The molecular weight characterization data.

Polymers	T (°C)	Molecular weights (g/mol) x 10^3					
		M_w		M_n		M_z	
		1	2	1	2	1	2
PP	185	145	133	121	895	539	339
HDPE(1)	160	146	118	100	202	925	825
HDPE(2)	160	53.1	52.7	9.85	23.4	276	206
PS	160	131	118	55.1	56.7	1930	1330
PMMA	220	730	857	10.2	12.4	351	311

Table F (2) The zero shear rate viscosity of homopolymers at 200 °C.

Polymers	The zero shear rate viscosity (dyn/cm^2)					
	1	2	3	4	5	AVG.
PP	2.16 x 10^4	2.05 x 10^4	2.01 x 10^4	2.03 x 10^4	2.10 x 10^4	2.09±0.05 x 10^4
HDPE(1)	2.30 x 10^5	2.01 x 10^5	2.80 x 10^5	1.83 x 10^5	2.50 x 10^5	2.30±0.40 x 10^5
HDPE(2)	8.50 x10^3	8.00 x10^3	7.00 x10^3	9.12 x10^3	8.13 x10^3	8.43±0.50 x 10^3
PS	9.00 x 10^4	6.00 x 10^4	7.61 x 10^4	7.82 x 10^4	5.01 x 10^4	7.09±1.58 x 10^4
PMMA	1.50 x 10^4	1.38 x 10^4	7.01 x 10^3	7.84 x 10^3	-	1.09±0.41 x 10^3

CURRICULUM VITAE

Name : Ms. Thanaporn Insuan

Birth Date : March 10, 1973

Nationality : Thai

University Education :

1991-1995 Bacherlor's Degree of Chemistry
King Mongkut's University of Technology
Thonburi, Bangkok

Working Experience :

1995-1997 Chemist
Research and Development Department
Thai Tin Plate Company