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APPENDICES

APPENDIX A

The determination of the trace amount of acrylamide by gas chromatography

The standard method for determination of the trace amount of acrylamide is based on METHOD 8032A. The procedure is as follows:

1. Procedure

1.1 Bromination

1.1 Pipet 50 ml of sample into a 100-ml glass –stoppered flask. Dissolve 7.5 g of potassium bromide into the sample, with stirring.

1.2 Adjust the pH of the solution with concentrated hydrobromic acid until the pH is between 1 and 3.

1.3 Wrap the flask with aluminum foil in order to exclude light. Add 2.5 ml of saturated bromine water, with stirring. Store the flask and contents in the dark, at 0°C, for at least 1 hour.

1.4 After reacting the solution for at least 1 hour, decompose the excess of bromine by adding 1 M sodium thiosulfate solution, drop, until the solution becomes colorless.

1.5 Add 15 g of sodium sulfate and stir vigorously using a magnetic stirrer.

1.2 Extraction

1.2.1 Transfer the solution into a 150 ml separatory funnel. Rinse the reaction flask three times with 1 ml aliquots of organic-free reagent water. Transfer the rinsing into the separatory funnel.

1.2.2 Extract the aqueous solution twice with 10 ml portions of ethyl acetate for 2 min each extraction. Dry the organic phase with 1 g of sodium sulfate.

1.2.3 Transfer the organic phase into a 25 ml volume metric flask. Rinse the sodium sulfate with three 1.5 ml portions of ethyl acetate and combine the rinsing with the organic phase.

1.2.4 Make the solution up to the 25 ml mark with ethyl acetate. Inject a 5 μL aliquot of this solution into the gas chromatograph.

2. Calibration

2.1 Inject 5 μL of a blank into gas chromatograph.

2.2 Prepare a minimum of five solutions of acrylamide.

The calibration curve of 2, 3-dibromopropionamide is shown in Figure A-1.

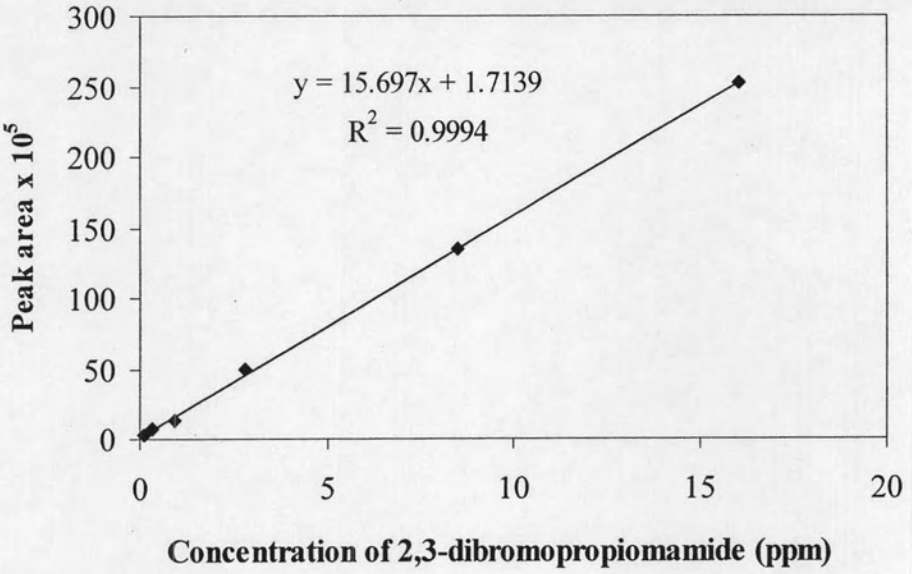


Figure A-1 Standard curve of brominated sample at concentrations ranged from 0.1 to 15 ppm.

APPENDIX B

The results of particle size distribution of mica are shown in Figure B-1, when mica was dispersed in water.

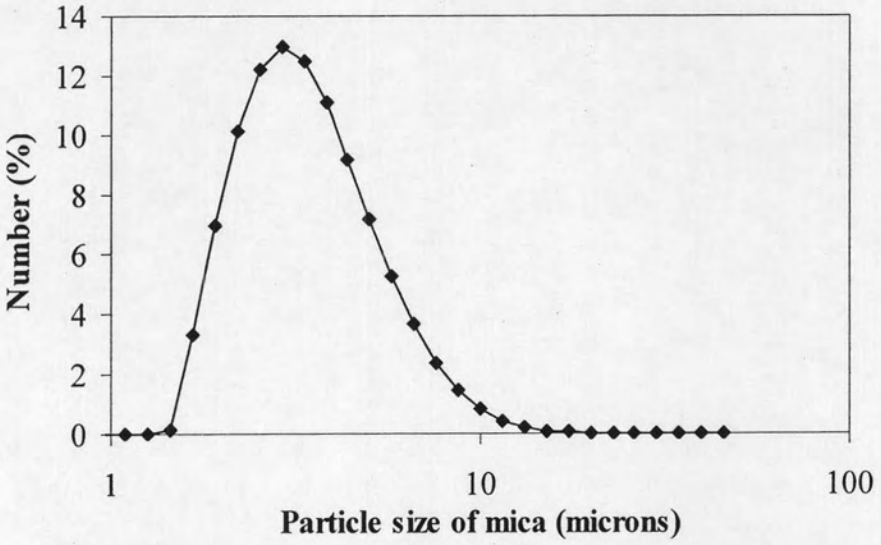
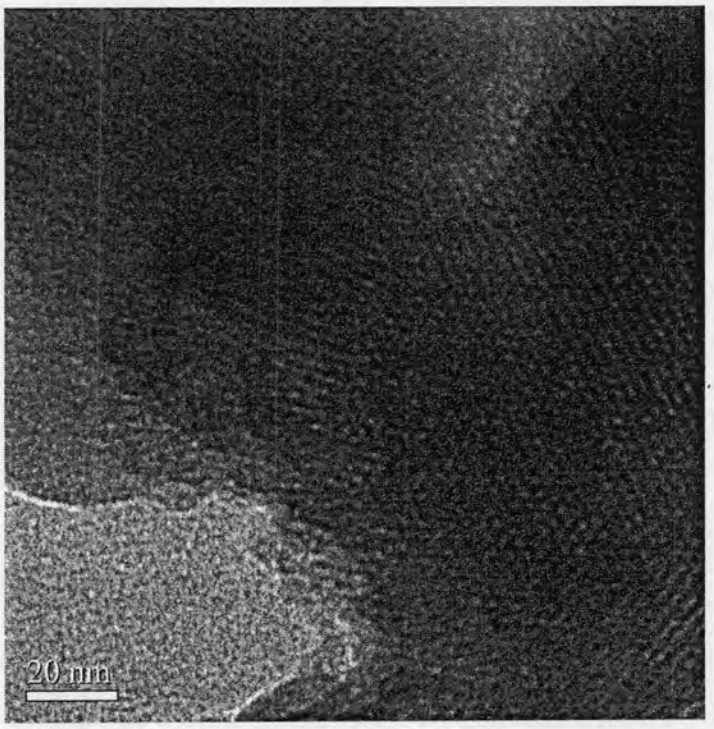


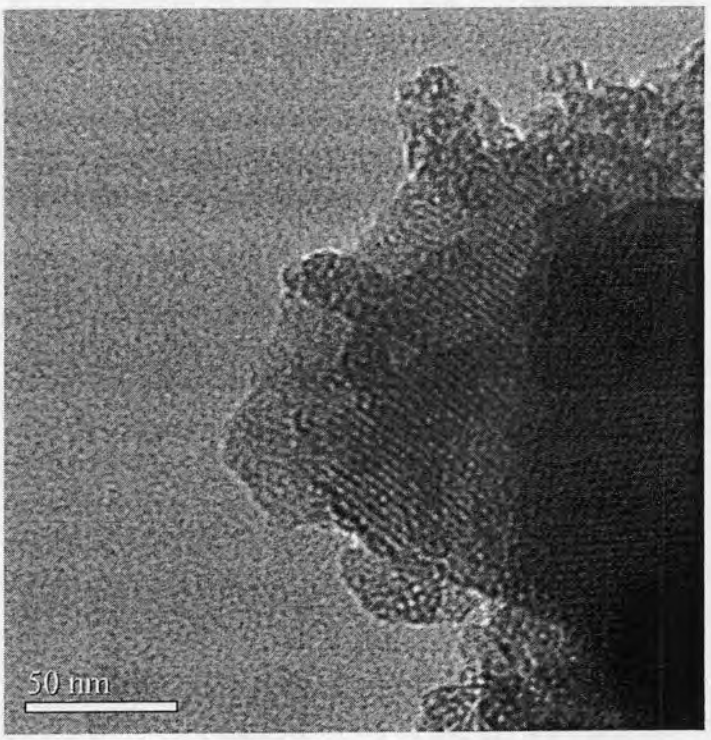
Figure B-1 Particle size distribution of mica

APPENDIX C

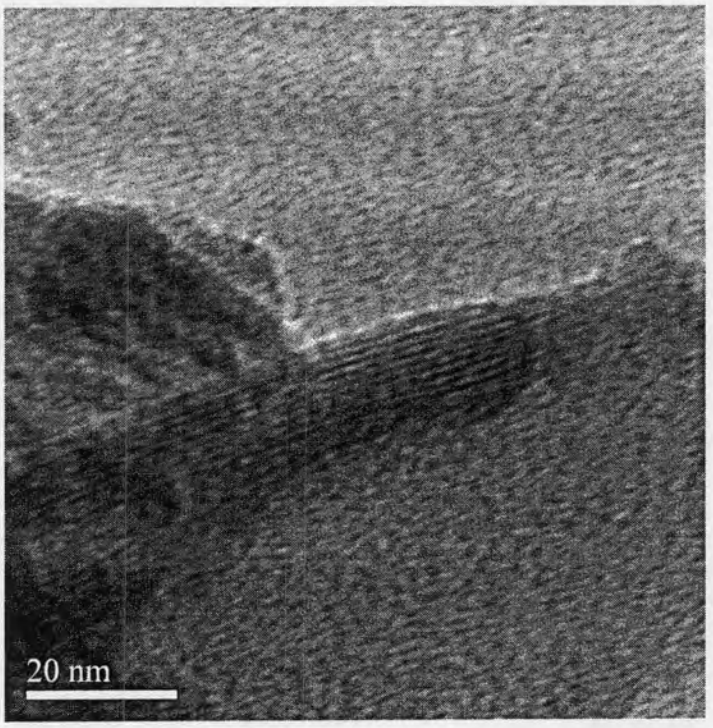
The TEM micrographs of polymer nanocomposites are shown in Figures C-1(a-d).



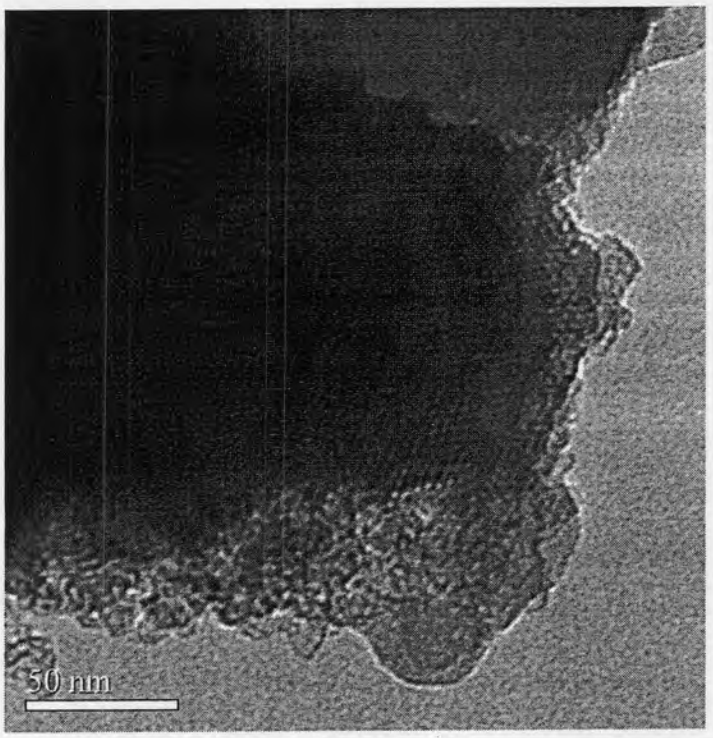
(a)



(b)



(c)



(d)

Figure C-1 TEM micrographs of (a-d) poly(AM-*co*-IA)/mica nanocomposites.

APPENDIX D

Table D-1 Thermogravimetric data of P(AM-*co*-IA)/mica composite at various mica contents, at 99/1 mole ratio of AM/IA*

AM/IA ratio 99/1, Mica content (% wt)	Number of decomposition stage	Temperature range (°C)	DTG maxima	Weight loss (%)	Residue at 800°C
0	1	25-215	195	9.8	15.7
	2	215-310	281	13.5	
	3	310-800	383	60.9	
5	1	25-212	63	12.6	22.00
	2	212-315	305	11.52	
	3	315-800	440	53.93	
15	1	25-240	216	8.4	34.2
	2	240-305	272	8.5	
	3	305-800	390	48.9	

*Polymerization reactions were carried out at AM/IA ratio of 99/1, 0.2% mole of N-MBA, 0.3% mole of APS, 1.2% mole of TEMED, mica contents at 5 and 15% wt, 50°C, and 30 min.

Table D-2 Thermogravimetric data of P(AM-*co*-IA)/mica composite at various mica contents, at 97/3 mole ratio of AM/IA*

AM/IA ratio 97/3, Mica content (% wt)	Number of decomposition stage	Temperature range (°C)	DTG maxima	Weight loss (%)	Residue at 800°C
0	1	25-140	82	6.1	16.8
	2	140-332	290	22.9	
	3	332-800	398	54.3	
5	1	25-118	69	5.8	22.2
	2	118-338	288	21.4	
	3	338-800	390	50.6	
15	1	25-119	79	5.7	28.1
	2	119-306	276	16.1	
	3	306-800	390	50.1	

*Polymerization reactions were carried out at AM/IA ratio of 97/3, 0.2% mole of N-MBA, 0.3% mole of APS, 1.2% mole of TEMED, mica contents at 5 and 15% wt, 50°C, and 30 min.

Table D-3 Thermogravimetric data of P(AM-*co*-IA)/mica composite at various mica contents, at 95/5 mole ratio of AM/IA*

AM/IA ratio 95/5, Mica content (% wt)	Number of decomposition stage	Temperature range (°C)	DTG maxima	Weight loss (%)	Residue at 800°C
0	1	25-210	81	11.4	20.24
	2	210-325	238	16.2	
	3	325-800	400	52.2	
5	1	25-210	83	10.45	28.86
	2	210-320	246	14.38	
	3	320-800	376	46.32	
15	1	25-170	89	6.88	34.75
	2	170-315	287	14.85	
	3	315-800	385	43.53	

*Polymerization reactions were carried out at AM/IA ratio of 95/5, 0.2%mole of N-MBA, 0.3% mole of APS, 1.2% mole of TEMED, mica contents at 5 and 15% wt, 50°C, and 30 min.

VITA

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