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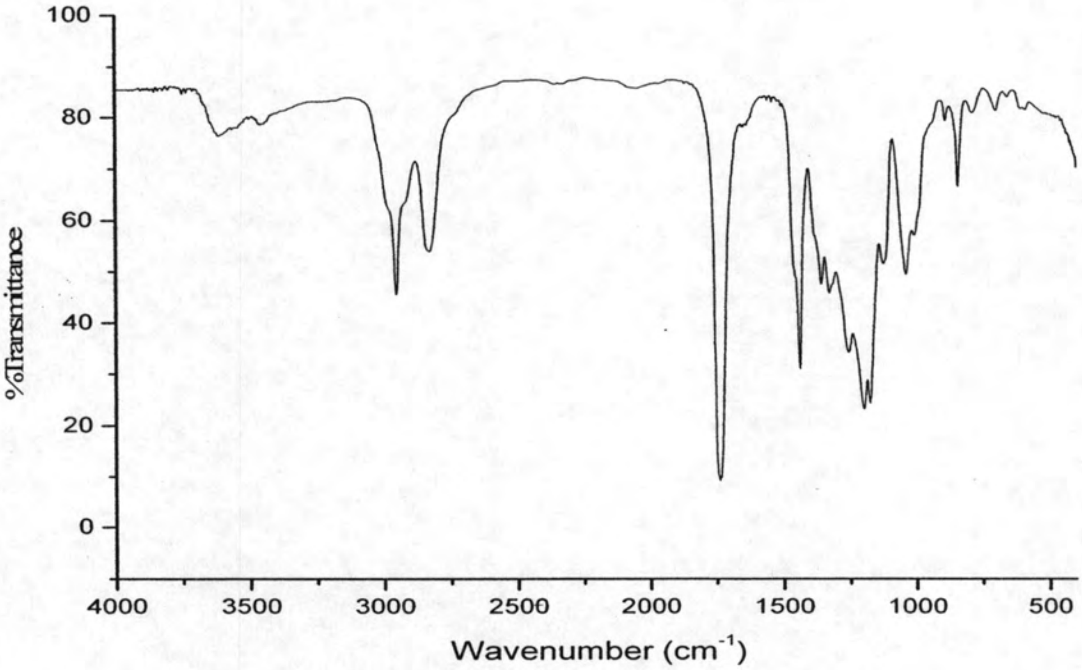
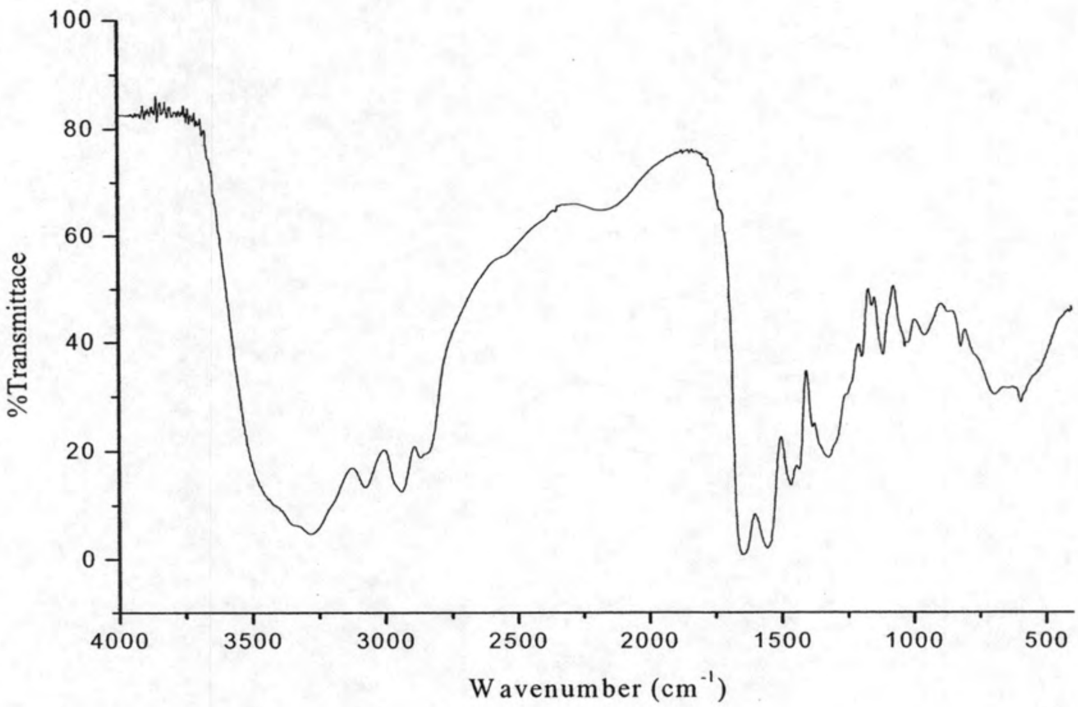
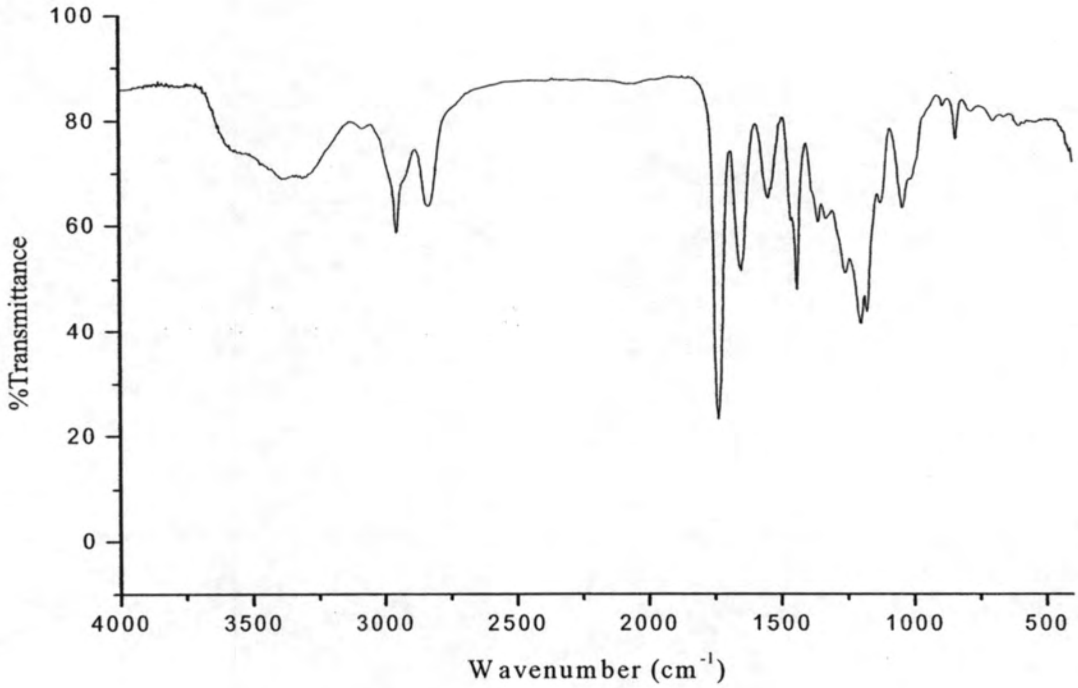
APPENDIX



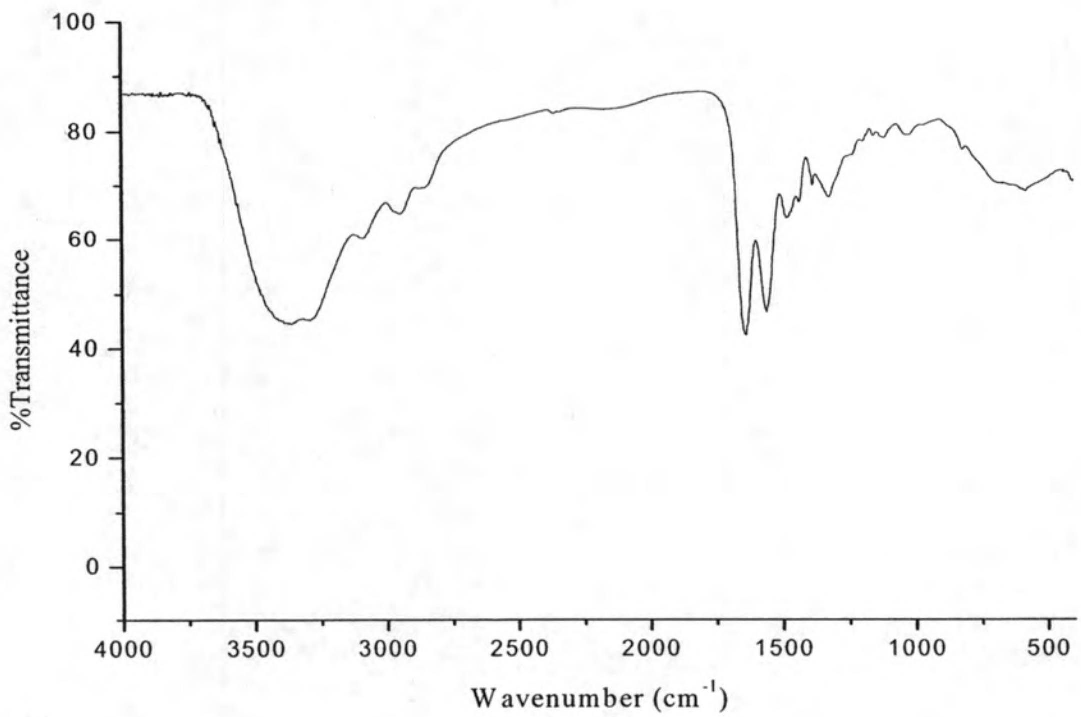
A 1. FTIR spectrum of G-0.5 hyperbranched dendritic PAMAM .



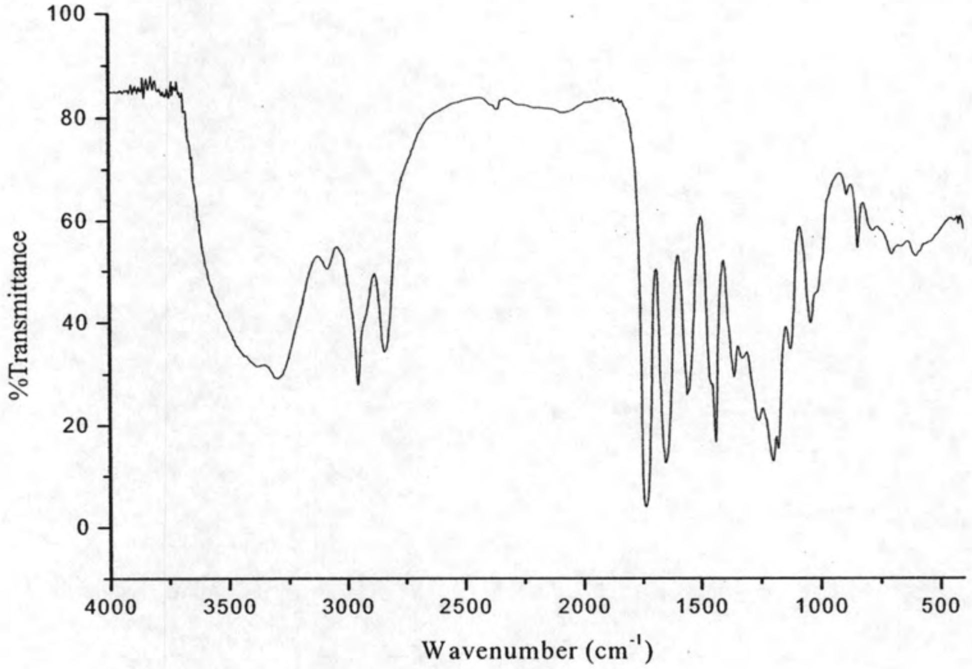
A 2. FTIR spectrum of G0.0 hyperbranched dendritic PAMAM .



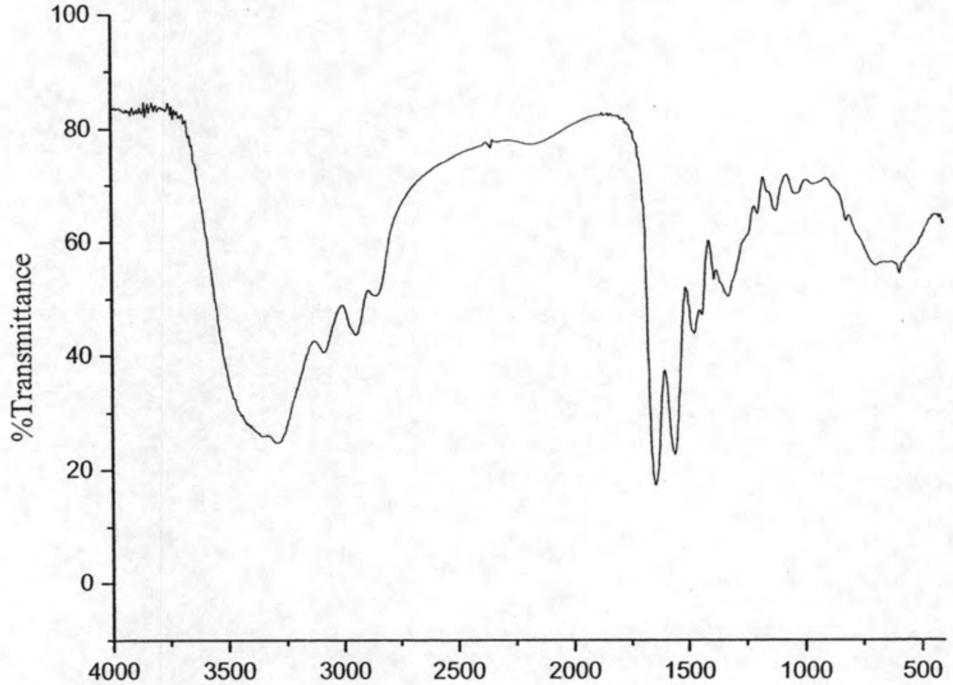
A 3. FTIR spectrum of G0.5 hyperbranched dendritic PAMAM .



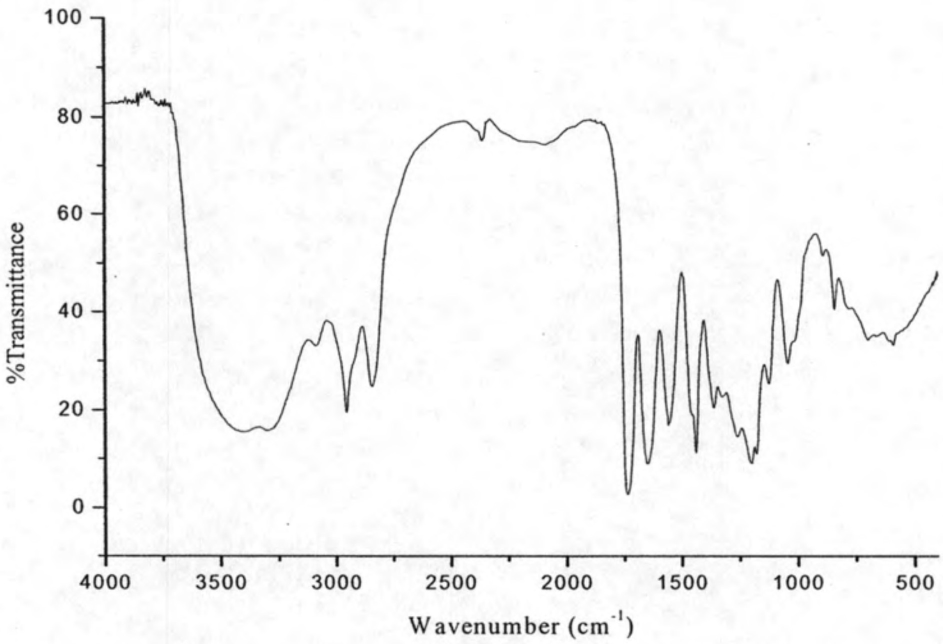
A 4. FTIR spectrum of G1.0 hyperbranched dendritic PAMAM .



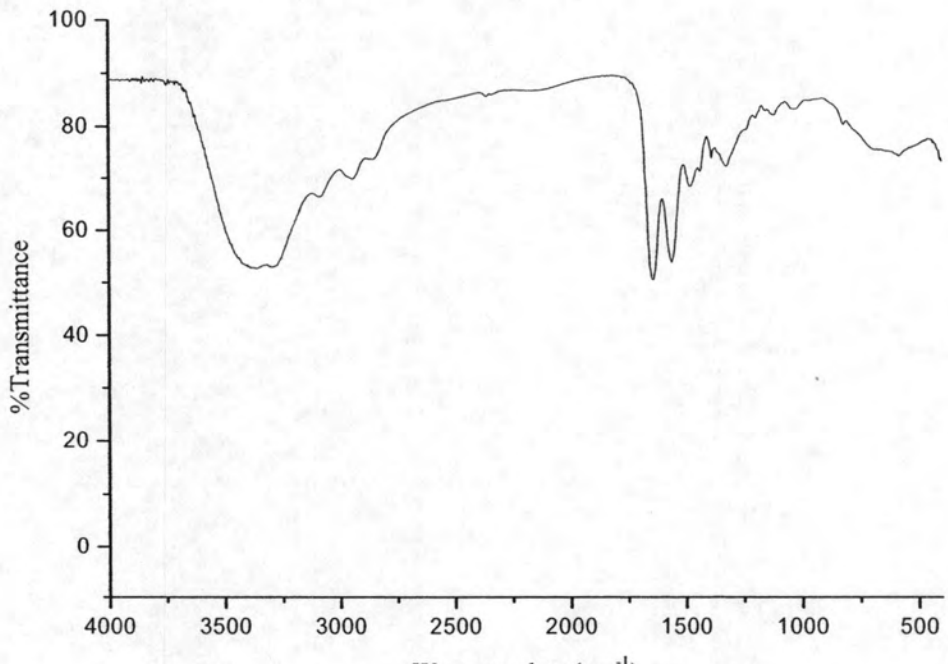
A 5. FTIR spectrum of G1.5 hyperbranched dendritic PAMAM .



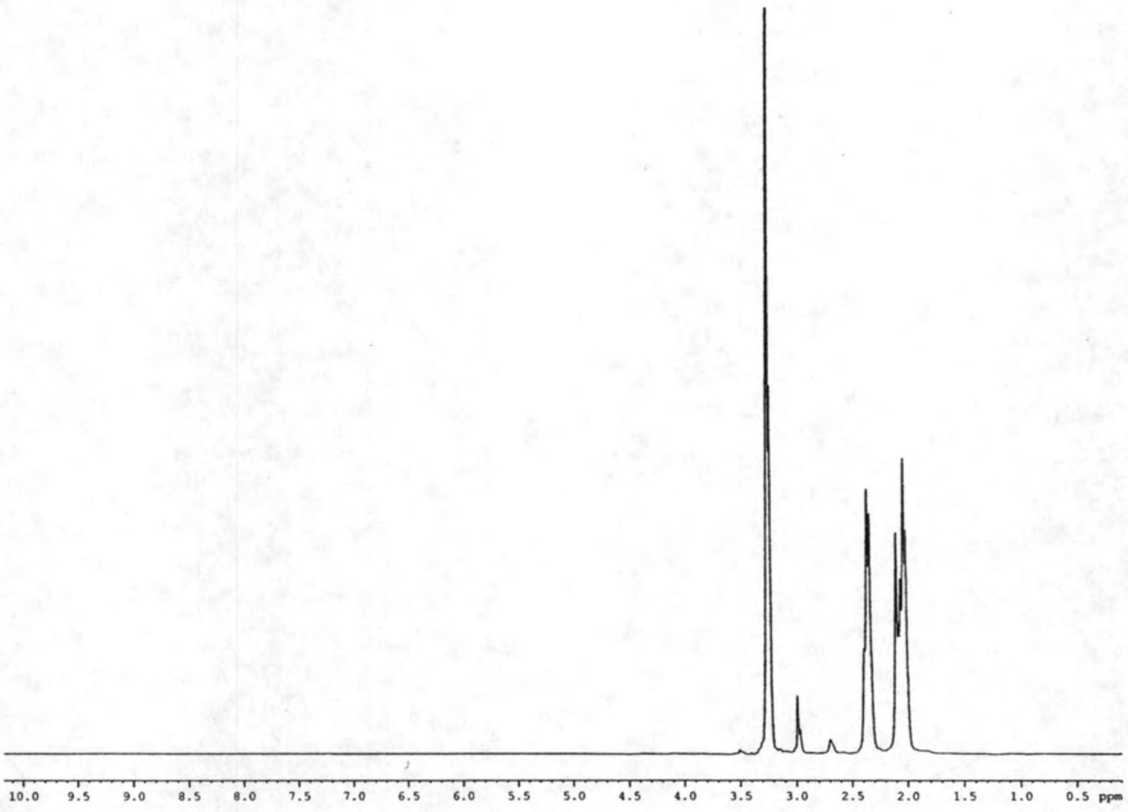
A 6. FTIR spectrum of G2.0 hyperbranched dendritic PAMAM .



A 7. FTIR spectrum of G2.5 hyperbranched dendritic PAMAM .

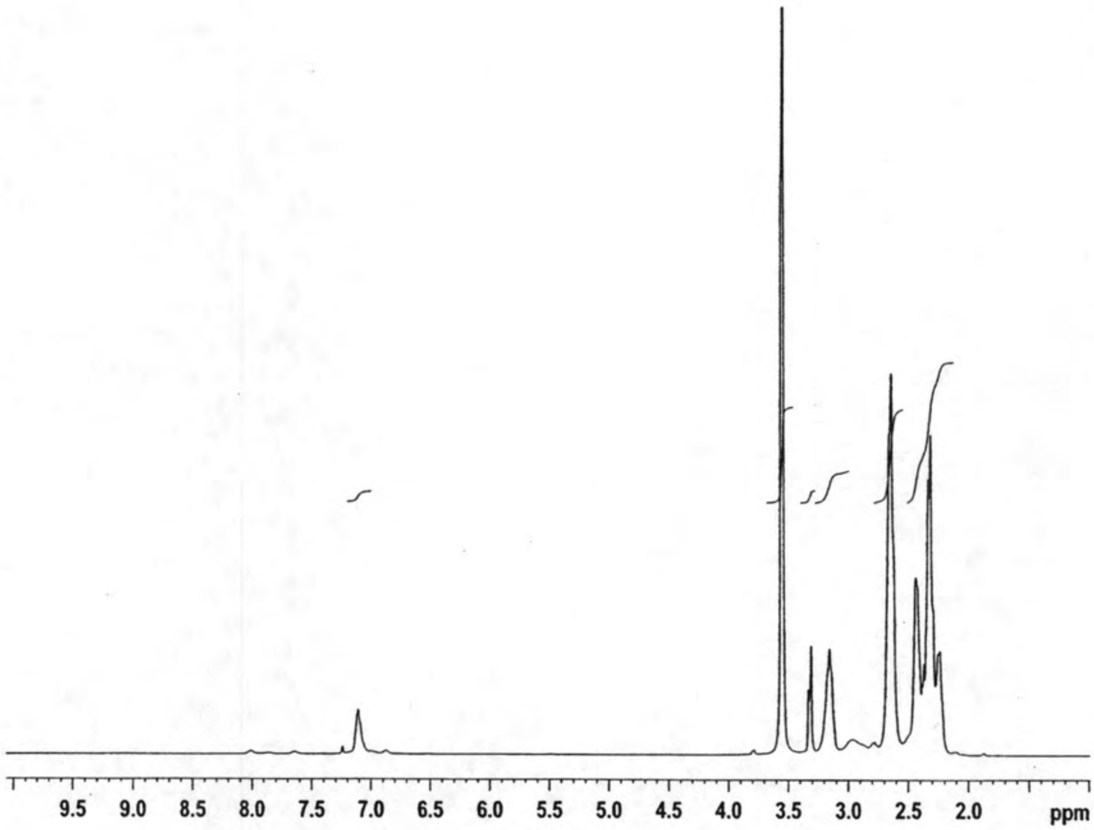


A 8. FTIR spectrum of G3.0 hyperbranched dendritic PAMAM .

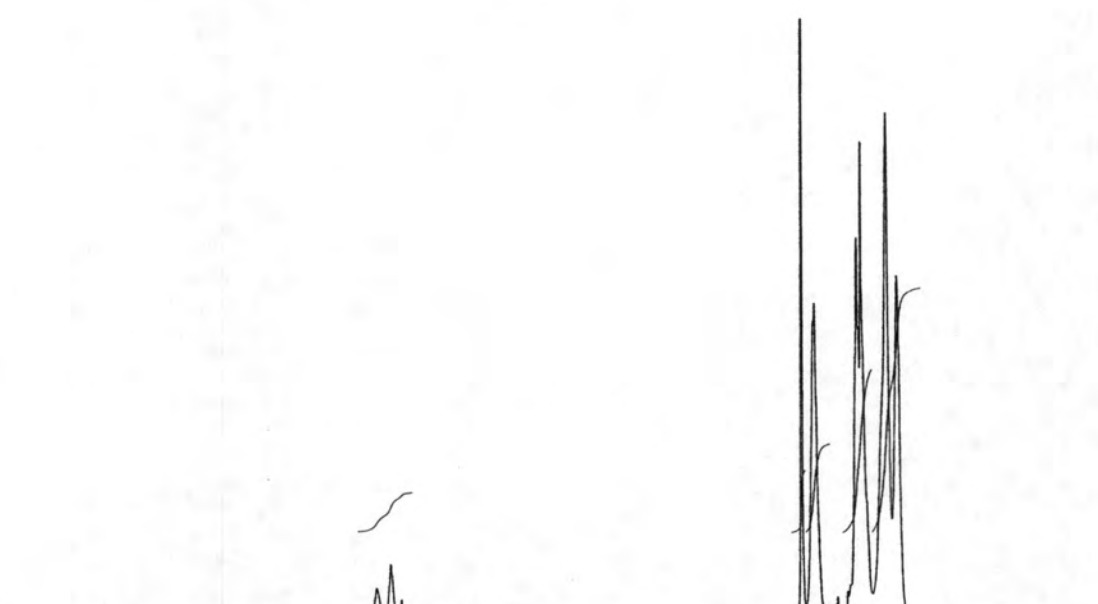


A 9. ^{1}H NMR spectrum of G-0.5 hyperbranched dendritic PAMAM .

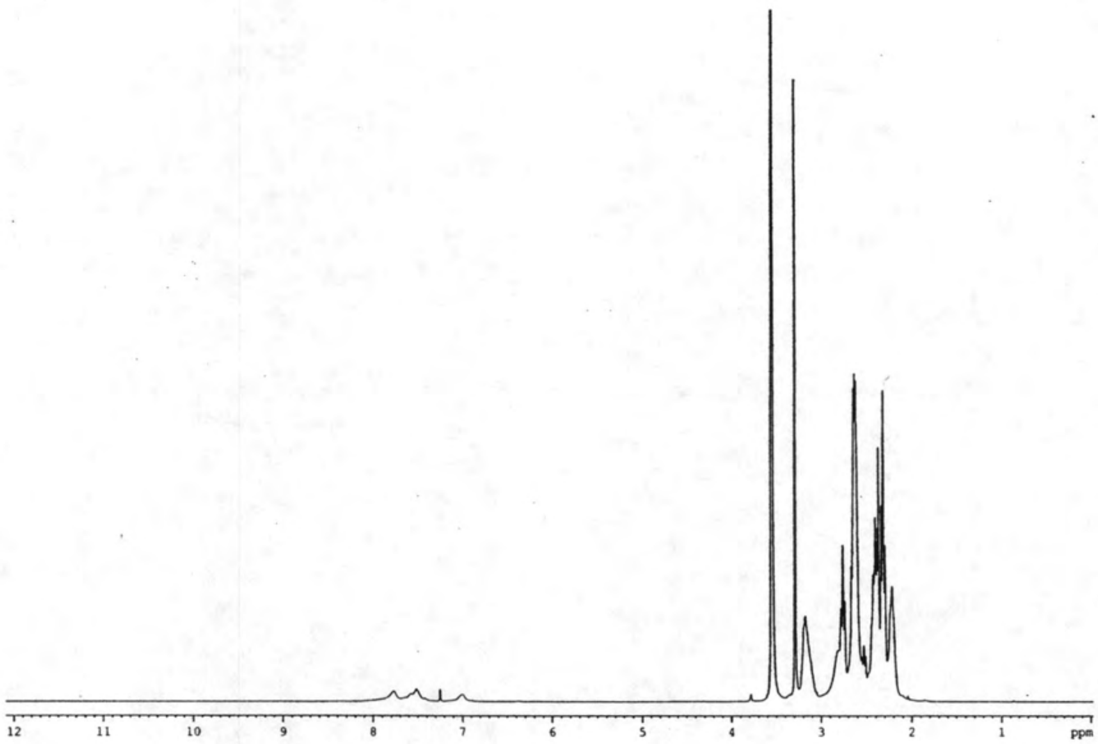
A 10. ^{1}H NMR spectrum of G0.0 hyperbranched dendritic PAMAM .



A 11. ^{1}H NMR spectrum of G0.5 hyperbranched dendritic PAMAM .

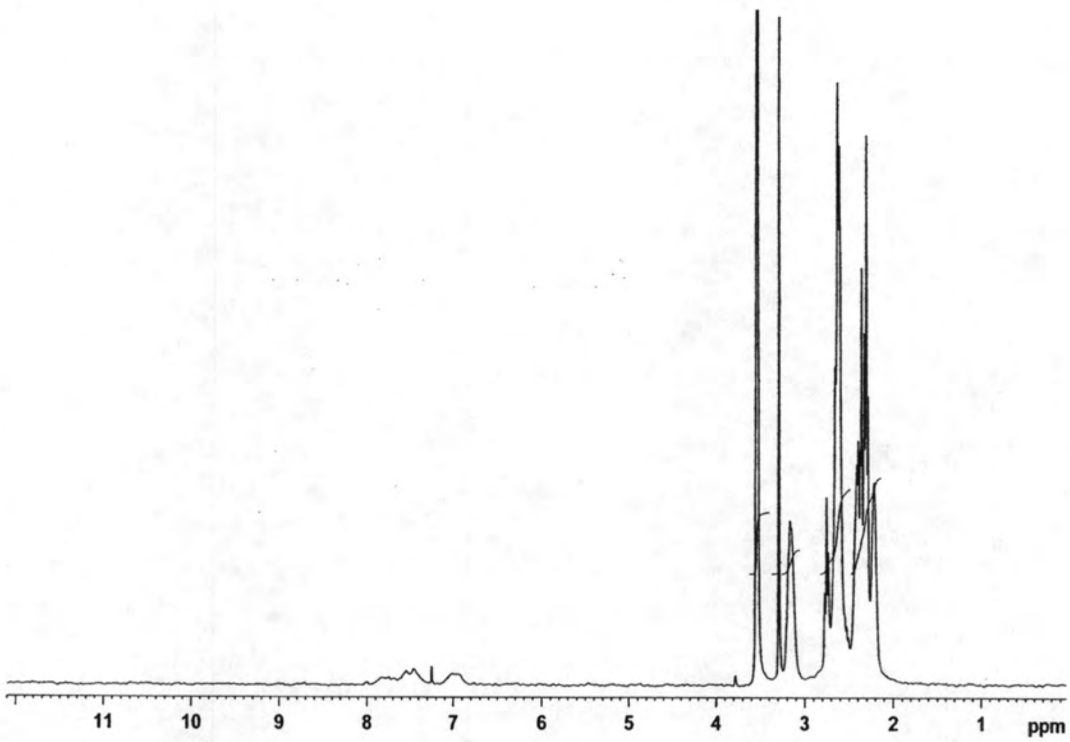


A 12. ^{1}H NMR spectrum of G1.0 hyperbranched dendritic PAMAM .



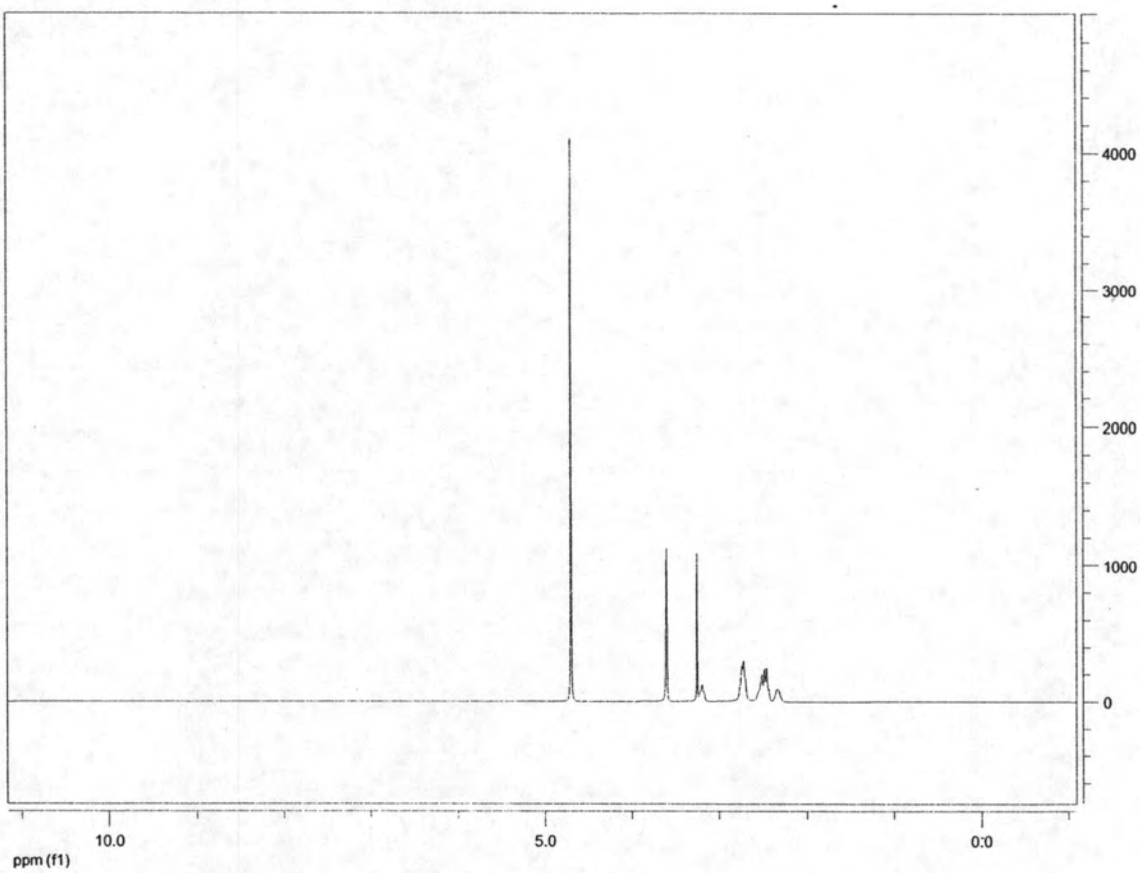
A 13. ^{1}H NMR spectrum of G1.5 hyperbranched dendritic PAMAM .

A 14. ^{1}H NMR spectrum of G2.0 hyperbranched dendritic PAMAM .

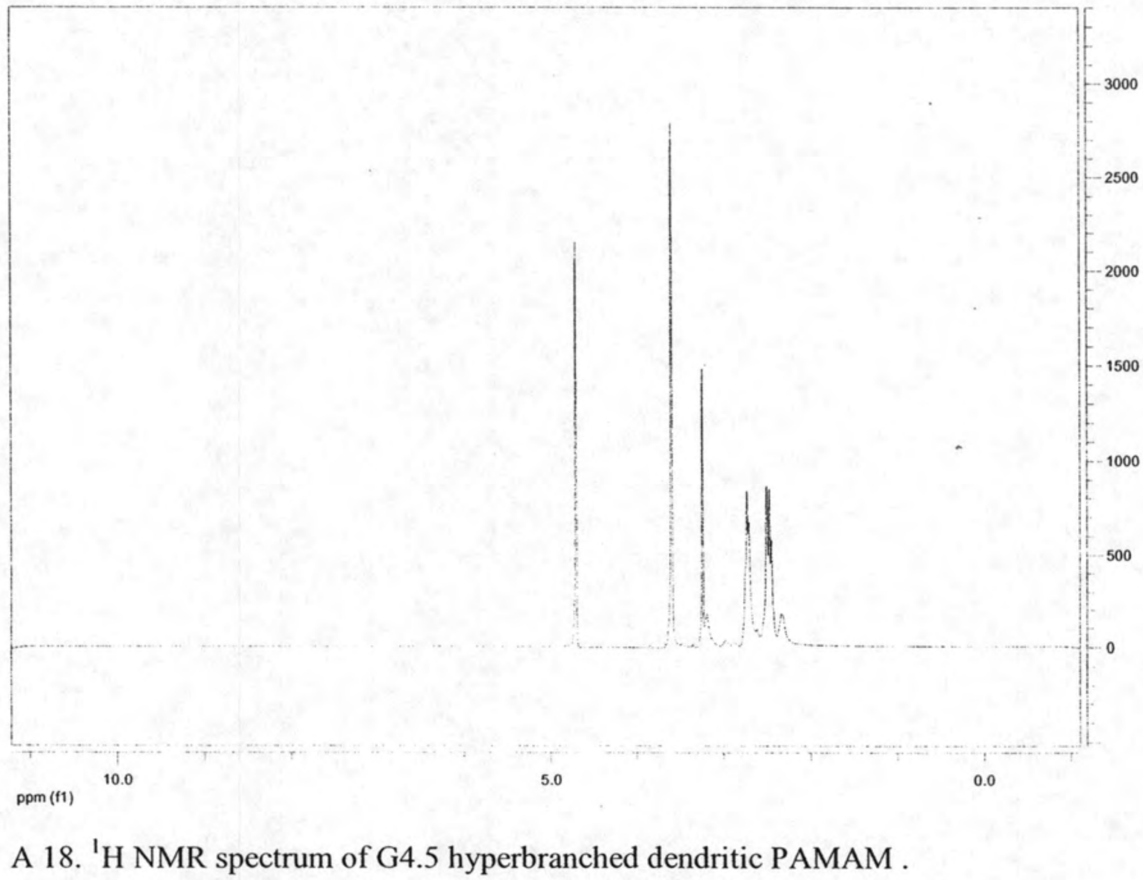


A 15. ^{1}H NMR spectrum of G2.5 hyperbranched dendritic PAMAM .

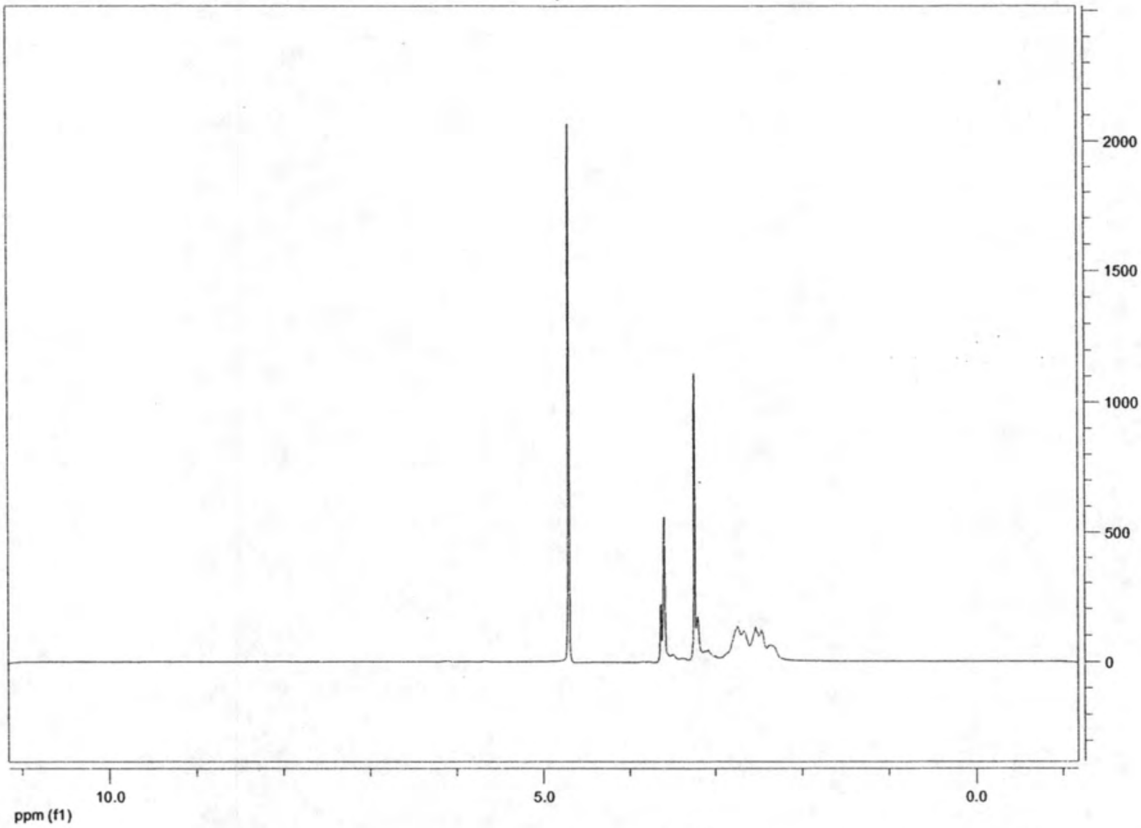
A 16. ^{1}H NMR spectrum of G3.0 hyperbranched dendritic PAMAM .



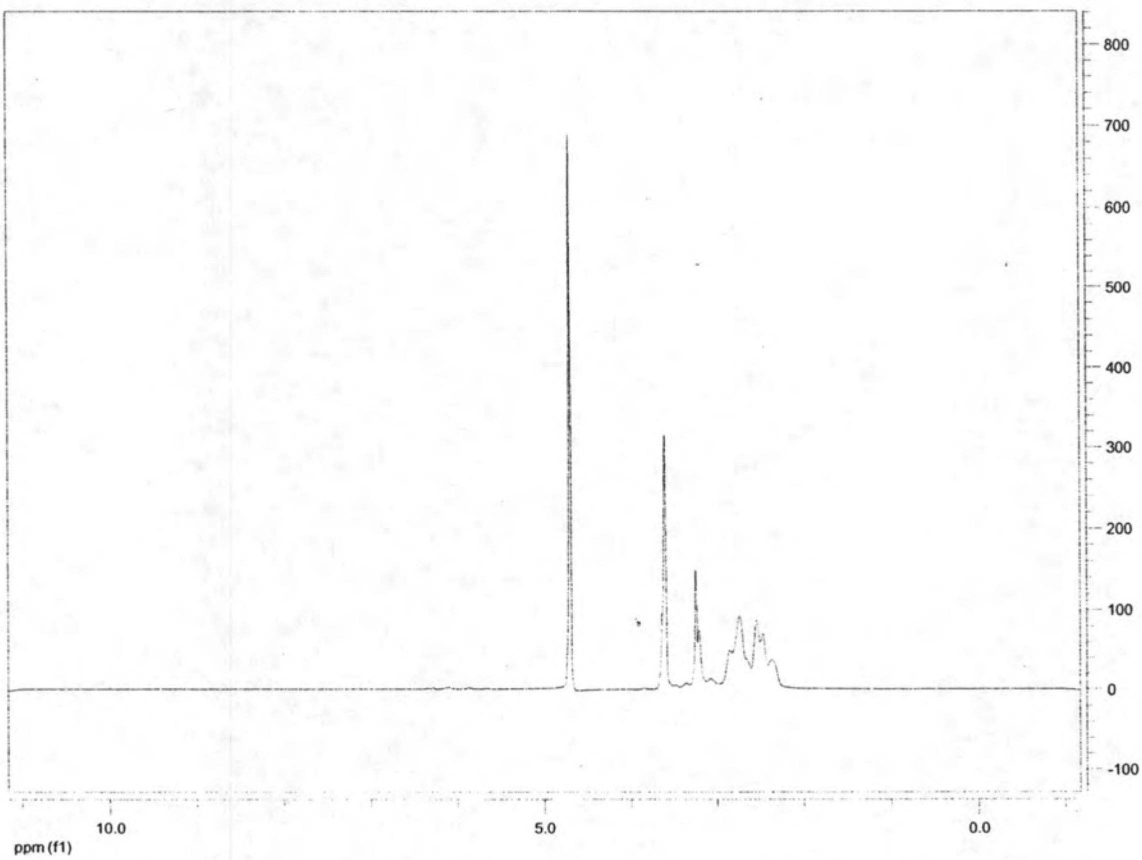
A 17. ^{1}H NMR spectrum of G3.5 hyperbranched dendritic PAMAM .



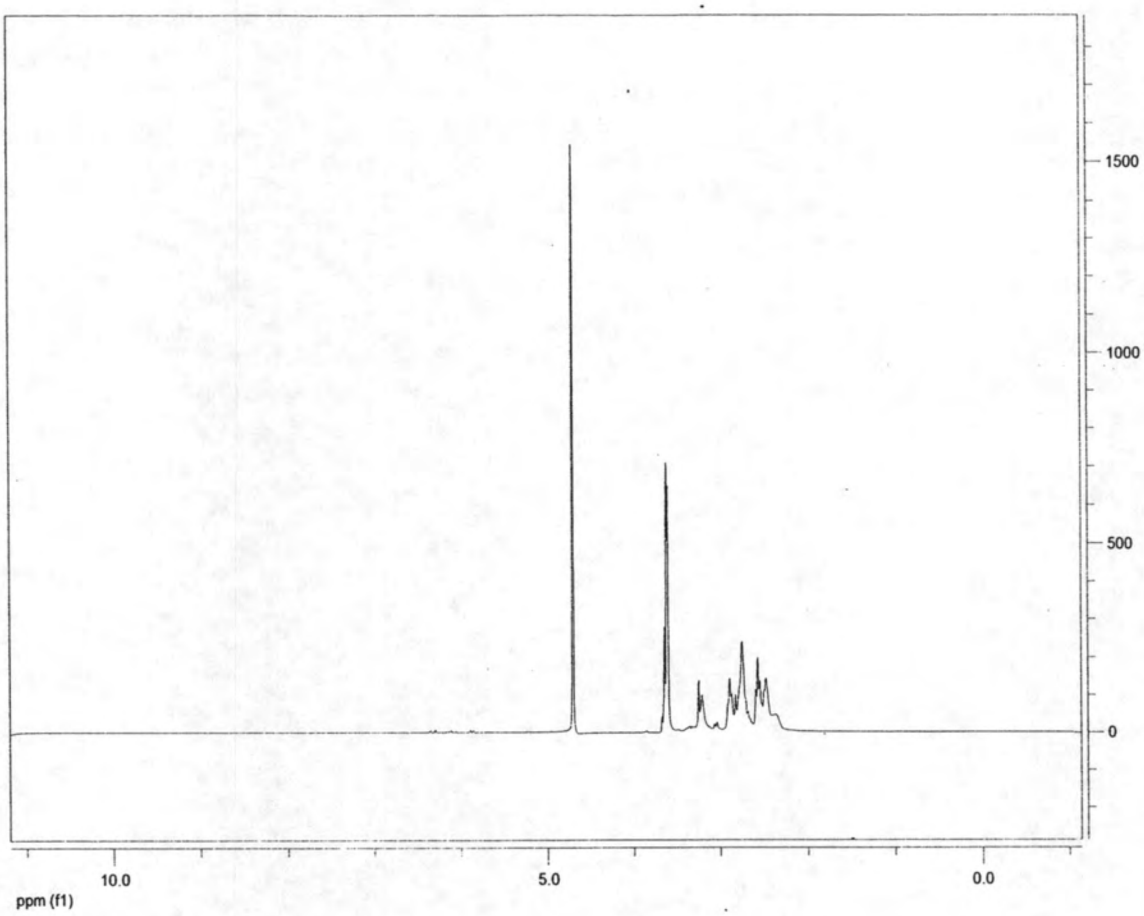
A 18. ^{1}H NMR spectrum of G4.5 hyperbranched dendritic PAMAM .



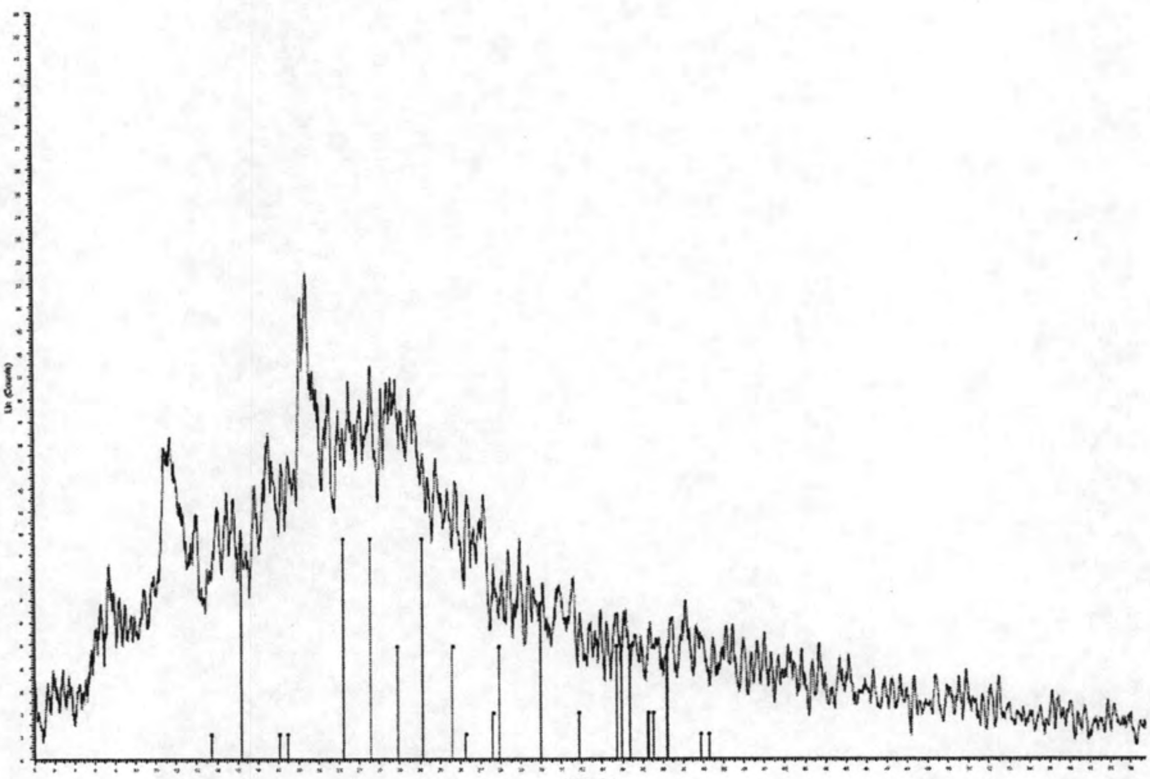
A 19. ^{1}H NMR spectrum of G2.5 cationic hyperbranched denditric PAMAM .



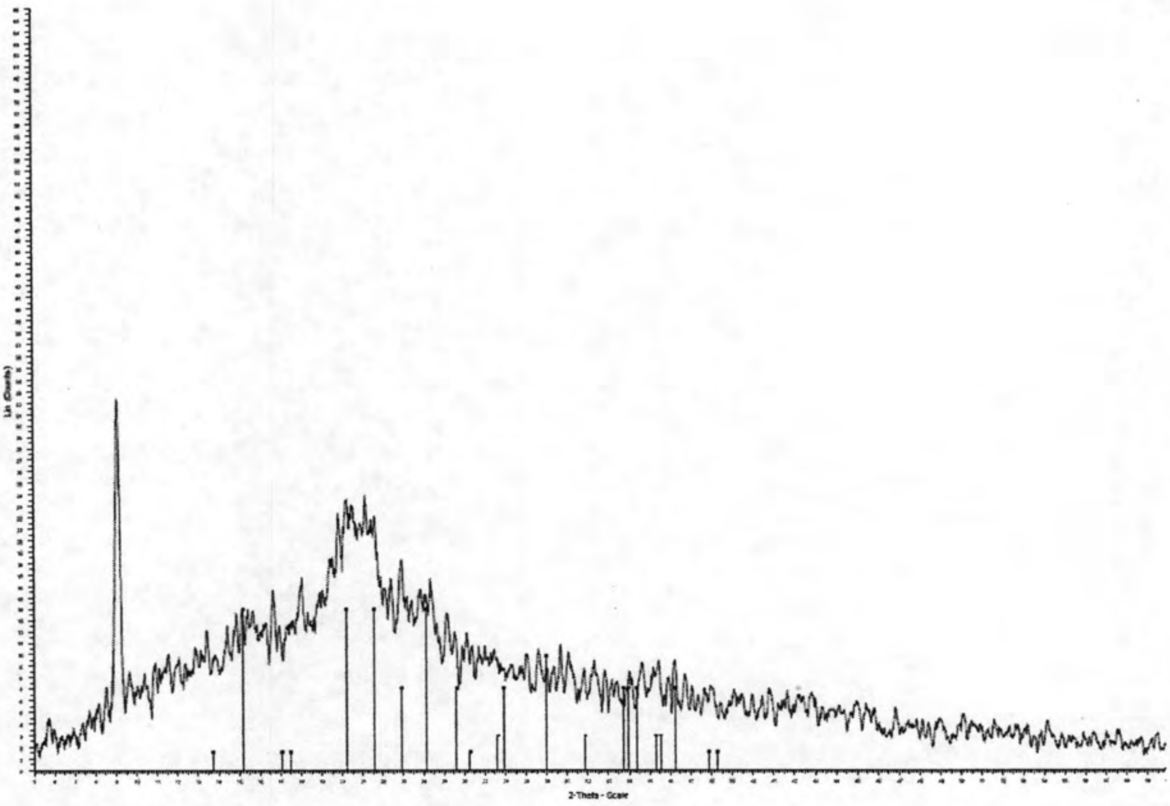
A 20. ^{1}H NMR spectrum of G3.5 cationic hyperbranched denditric PAMAM .



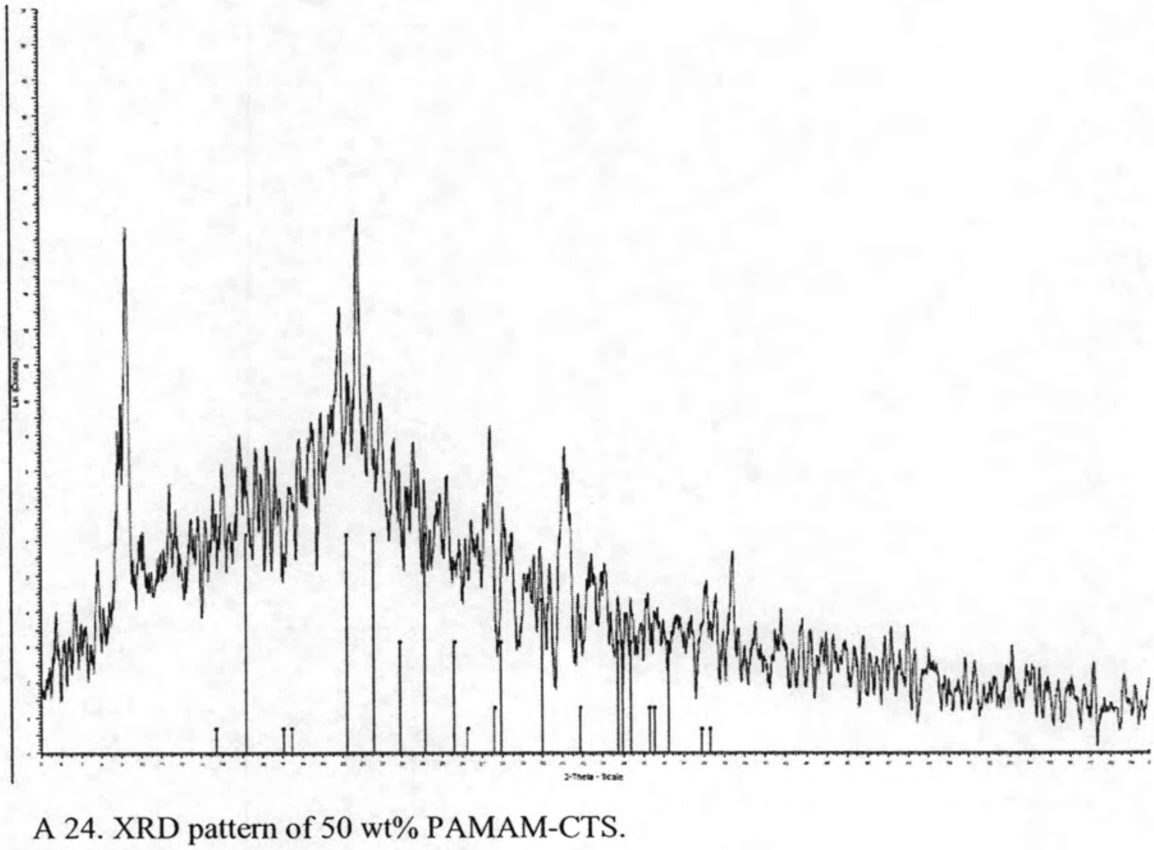
A 21. ^{1}H NMR spectrum of G4.5 cationic hyperbranched denditric PAMAM .



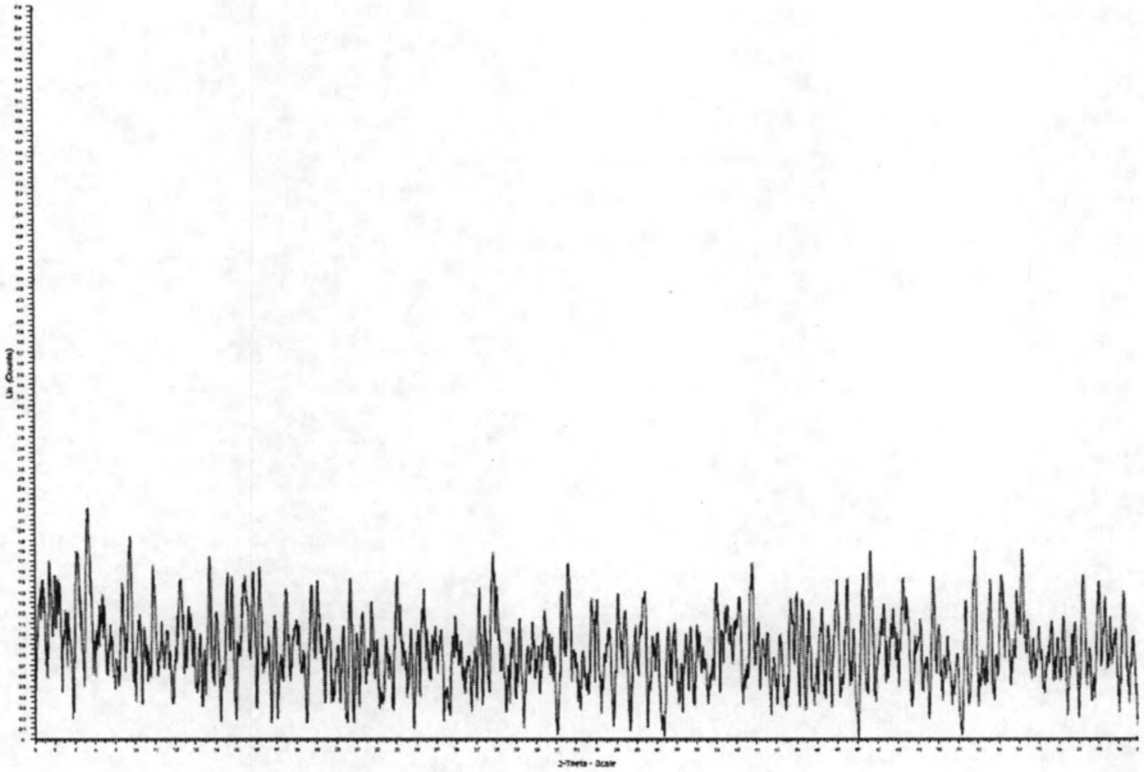
A 22. XRD pattern of Chitosan .



A 23. XRD pattern of 10 wt% PAMAM-CTS.



A 24. XRD pattern of 50 wt% PAMAM-CTS.



A 25. XRD pattern of excessive PAMAM-CTS.

A 26. Antimicrobial activity of cotton fabric treated with cationic hyperbranched dendritic PAMAM

Generation of dendrimer	Dendrimer (% w/v)	The number of bacteria CFU/ml (0 hr.)	The number of bacteria CFU/ml (24 hrs.)	% Reduction
2.5	5	3.8×10^{8}	8.6×10^{7}	77.36
	10	4.7×10^{8}	1.0×10^{7}	97.87
	15	4.0×10^{8}	3.5×10^{7}	91.25
	20	5.8×10^{8}	5.7×10^{7}	90.17
3.5	5	5.4×10^{8}	2.5×10^{8}	53.70
	10	4.6×10^{8}	2.6×10^{8}	43.47
	15	4.2×10^{8}	1.8×10^{8}	57.14
	20	5.3×10^{8}	2.1×10^{8}	60.37
4.5	5	4.3×10^{8}	3.4×10^{8}	20.93
	10	5.0×10^{8}	3.1×10^{8}	38.00
	15	3.6×10^{8}	3.1×10^{8}	13.88
	20	4.9×10^{8}	3.1×10^{8}	36.73

A 27. Antimicrobial activity of cotton fabric treated with chitosan and cationic hyperbranched dendritic polyamidoamine (combined treatment)

Generation of dendrimer	Dendrimer (% w/v)	Chitosan (% w/v)	The number of bacteria CFU/ml (0 hr.)	The number of bacteria CFU/ml (24 hrs.)	% Reduction
2.5	15	0.1	5.3×10^8	1.1×10^8	79.24
		0.5	4.2×10^8	1.0×10^8	76.19
		1.0	6.0×10^8	3.9×10^8	35.0
	20	0.1	1.2×10^8	4.0×10^6	96.66
		0.5	1.2×10^8	3.6×10^6	97.00
		1.0	1.2×10^8	1.5×10^6	98.75
3.5	15	0.1	4.1×10^8	2.1×10^8	48.78
		0.5	4.1×10^8	3.8×10^8	7.31
		1.0	1.9×10^8	1.2×10^8	36.84
	20	0.1	4.1×10^8	1.6×10^8	60.97
		0.5	1.9×10^8	7.1×10^7	62.63
		1.0	3.6×10^8	5.3×10^8	0
4.5	15	0.1	8.5×10^8	3.5×10^8	58.82
		0.5	7.7×10^8	2.1×10^8	72.72
		1.0	7.4×10^8	5.1×10^8	31.08
	20	0.1	8.5×10^8	4.7×10^8	44.70
		0.5	7.1×10^8	4.1×10^8	42.25
		1.0	7.3×10^8	4.8×10^8	34.24

BIOGRAPHY

Miss Benjamas Klaykruayat was born in Phra Nakhon Sri Ayutthaya, Thailand on December 23, 1978 as a daughter of Mr. Nikom Klaykruayat and Mrs. Ubol Klaykruayat. She graduated from Chomsurang Upatham School in March 1997. She received her Bachelor of Science with a major in Materials Science, Chulalongkorn University in 2001 and graduated a Master of Science with a major in Applied Polymer Science and Textile Technology, Chulalongkorn University in 2003. She continued her graduate study in Materials Science Program, Department of Materials Science, Faculty of Science, Chulalongkorn University, and completed her Ph.D. Degree in October 2009.