

Triptycene Based Organosoluble Polyamides: Synthesis, Characterization and Study of The Effect of Chain Flexibility on Morphology

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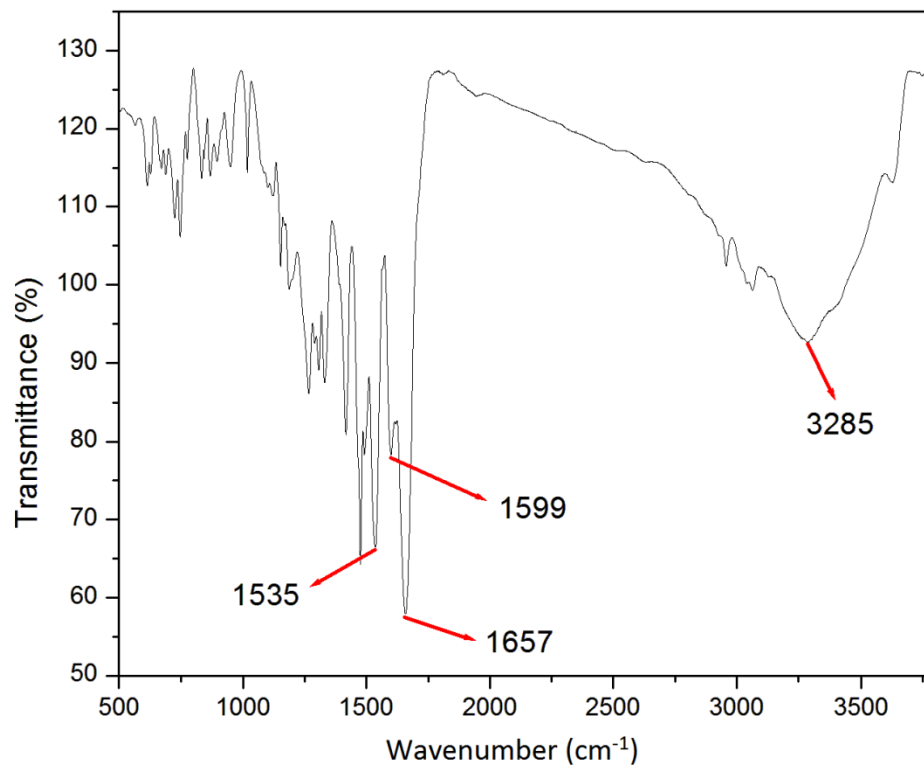
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Table of contents

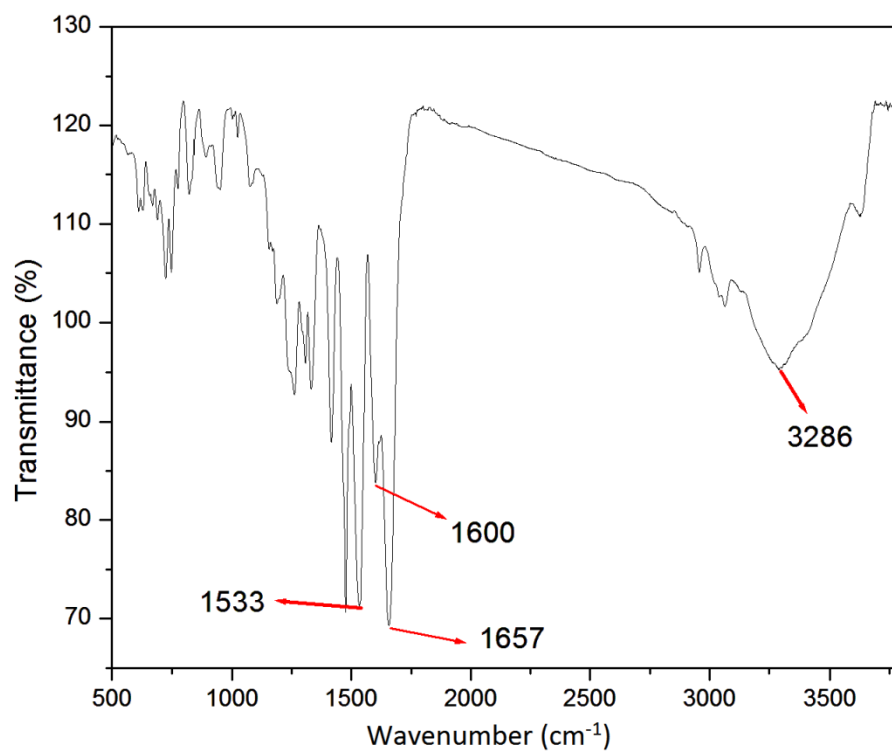
- 1) FT-IR spectra of **TPA1**, **TPA2**, **TPA4** and **TPA5**
- 2) ¹H NMR spectra of 2,6-diaminotriptycene
- 3) ¹H NMR spectra of **TPA1**, **TPA2**, **TPA4** and **TPA5**
- 4) GPC traces of **TPA1-TPA6**
- 5) DSC traces of **TPA1-TPA6**
- 6) **Table S1:** Solubility Properties of **TPA1-TPA6** in various Solvents.
- 7) **Table S2:** Comparison of **TPAs** with existing polyamide containing triptycene unit.

FT-IR Spectra

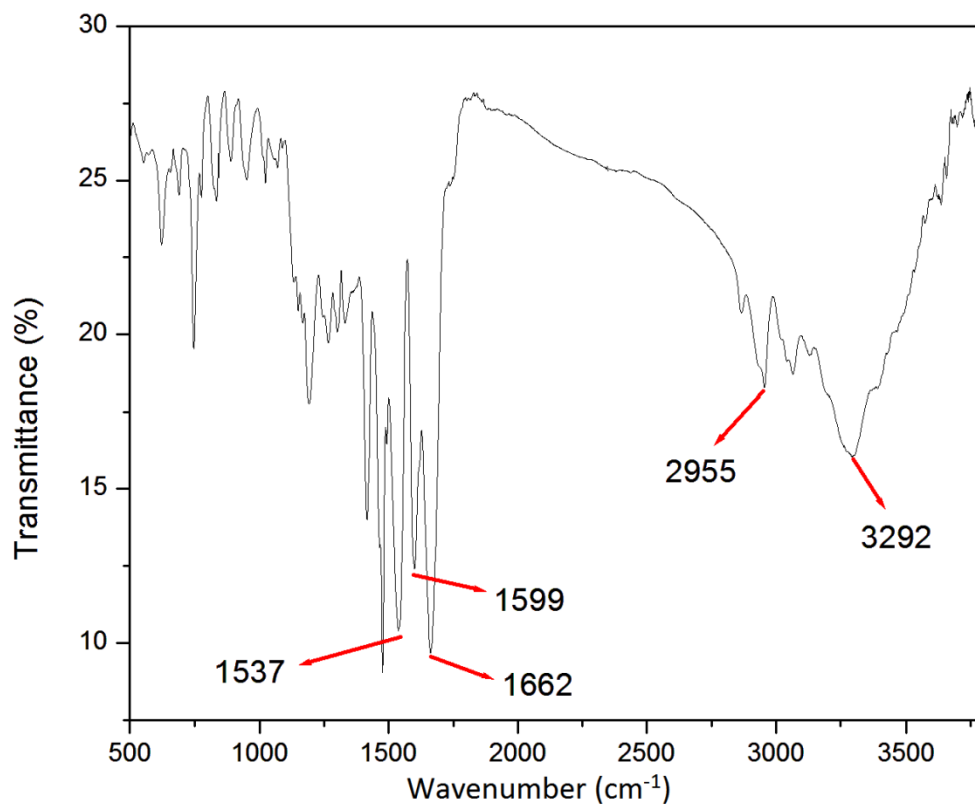
TPA1



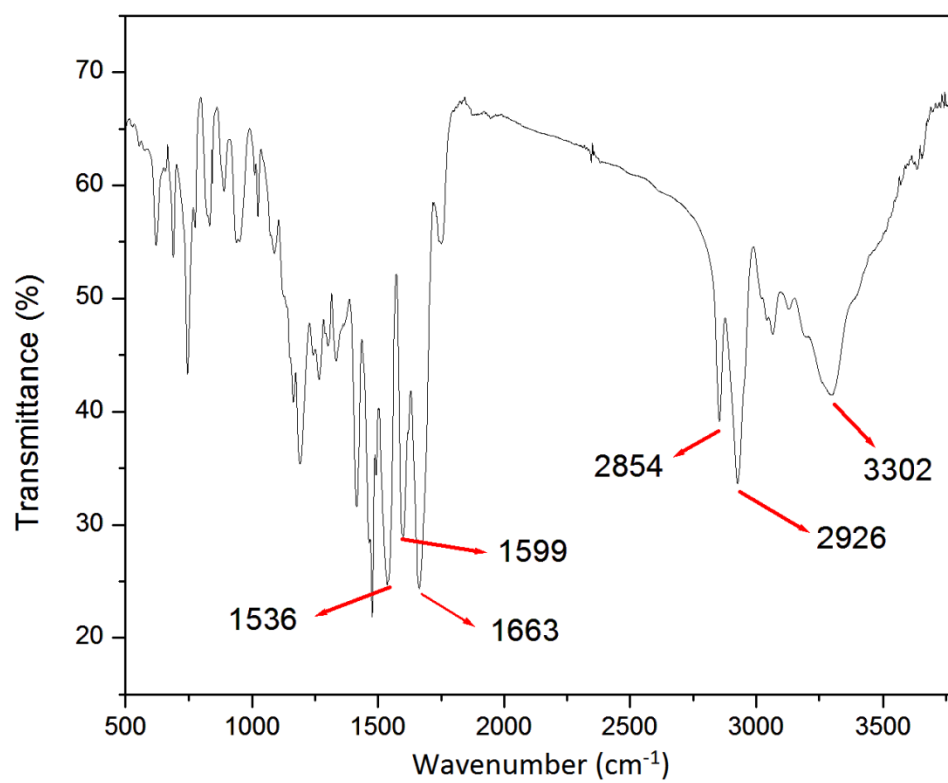
TPA2



TPA4

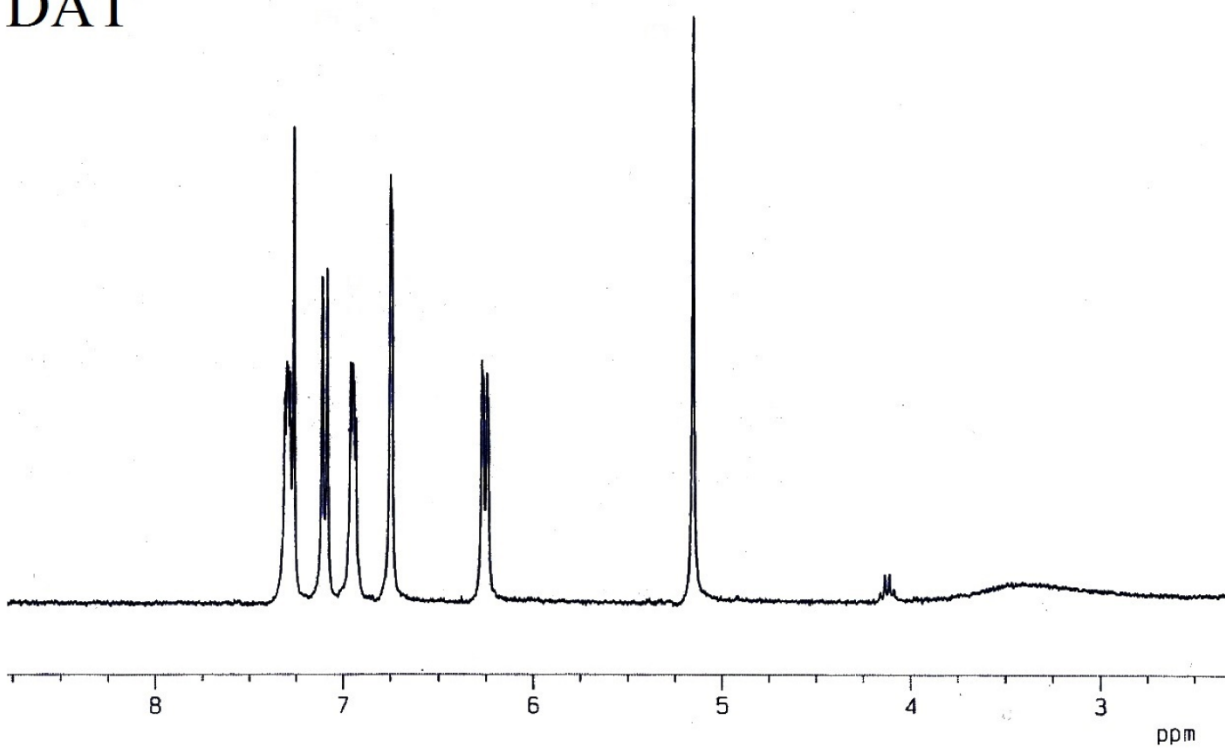


TPA5

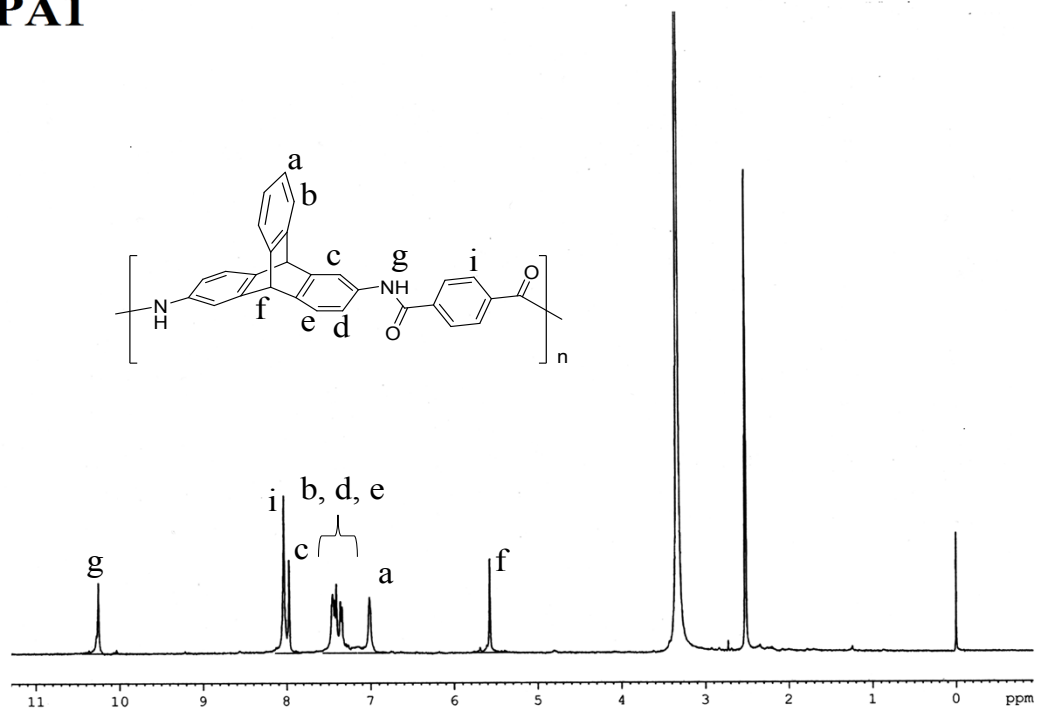


^1H NMR spectra

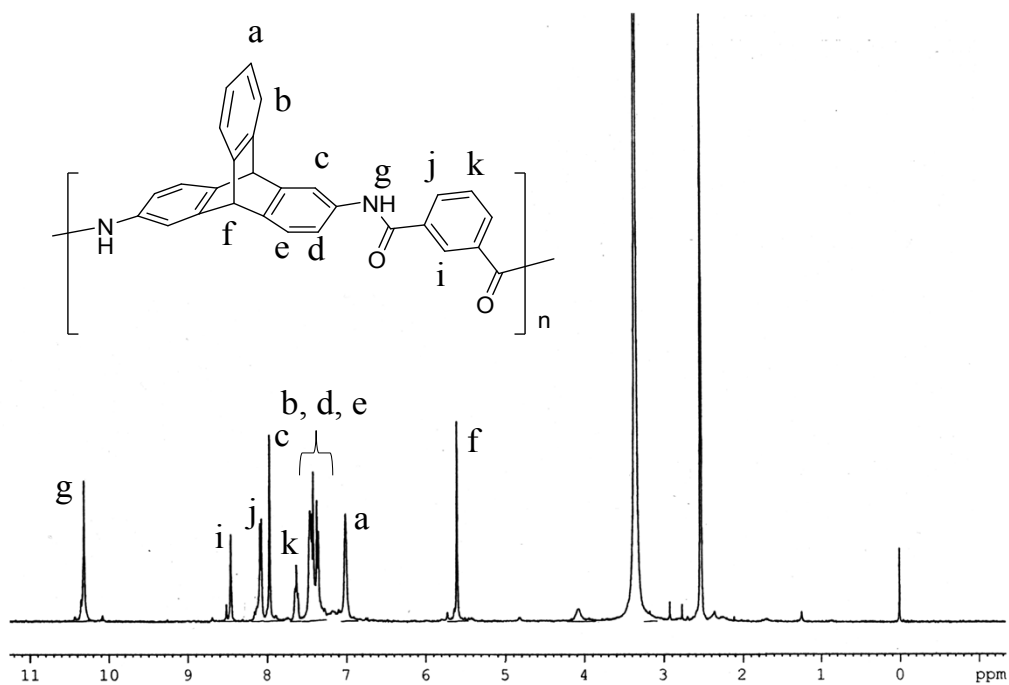
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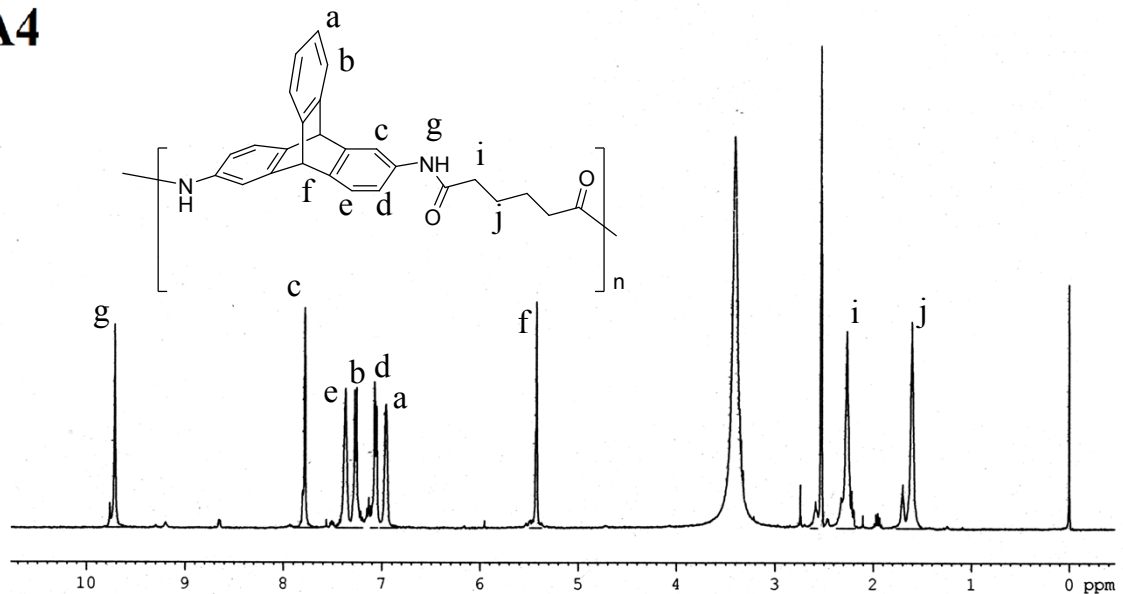
TPA1



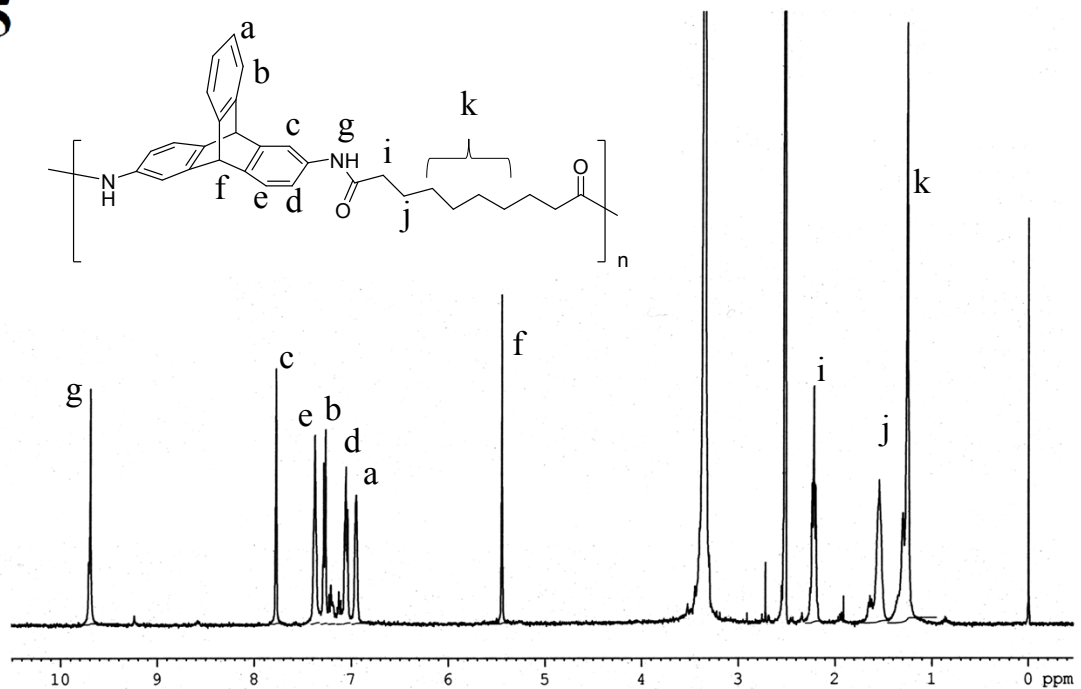
TPA2



TPA4



TPA5



GPC traces of TPA1-TPA6

TPA1

MW Averages

Mp: 27917

Mn: 25335

Mv: 30263

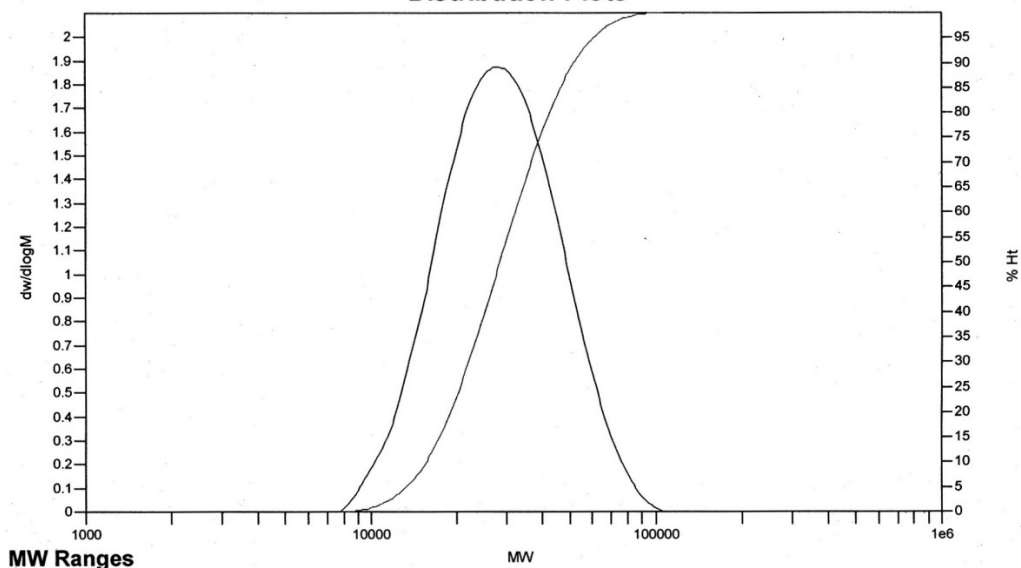
Mw: 31215

Mz: 38109

Mz+1: 45463

PD: 1.2321

Distribution Plots



TPA2

MW Averages

Mp: 29641

Mn: 26641

Mv: 31059

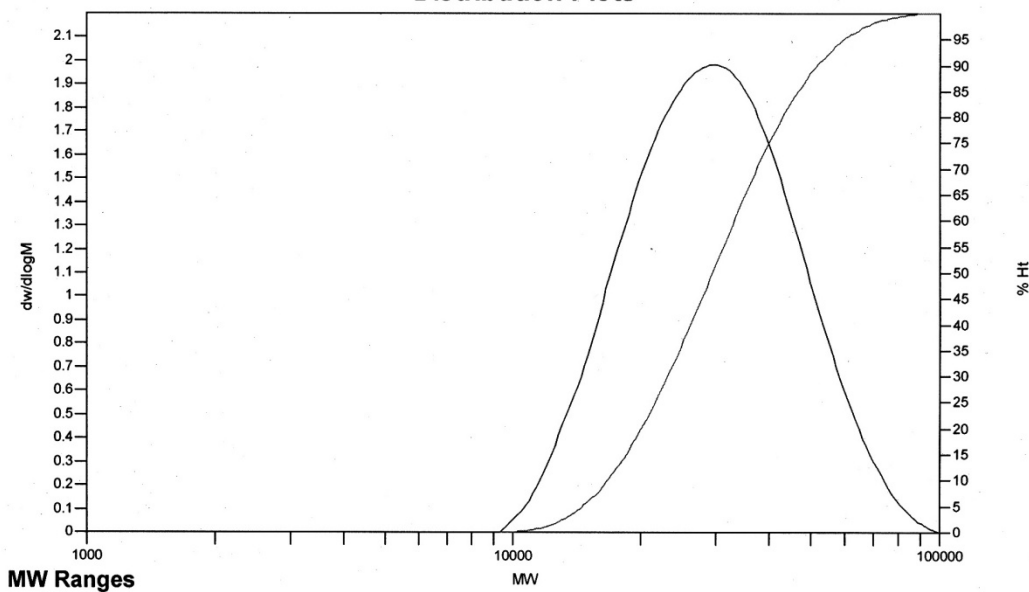
Mw: 31909

Mz: 37999

Mz+1: 44431

PD: 1.1977

Distribution Plots

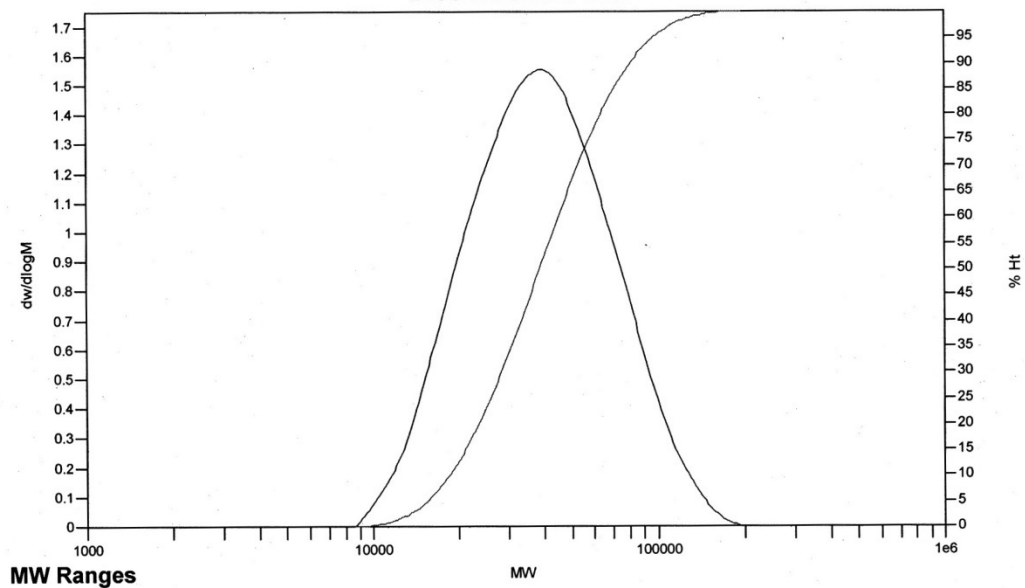


TPA3

MW Averages

Mp: 39204 Mn: 32922 Mv: 42686 Mw: 44672
Mz: 59629 Mz+1: 76012 PD: 1.3569

Distribution Plots

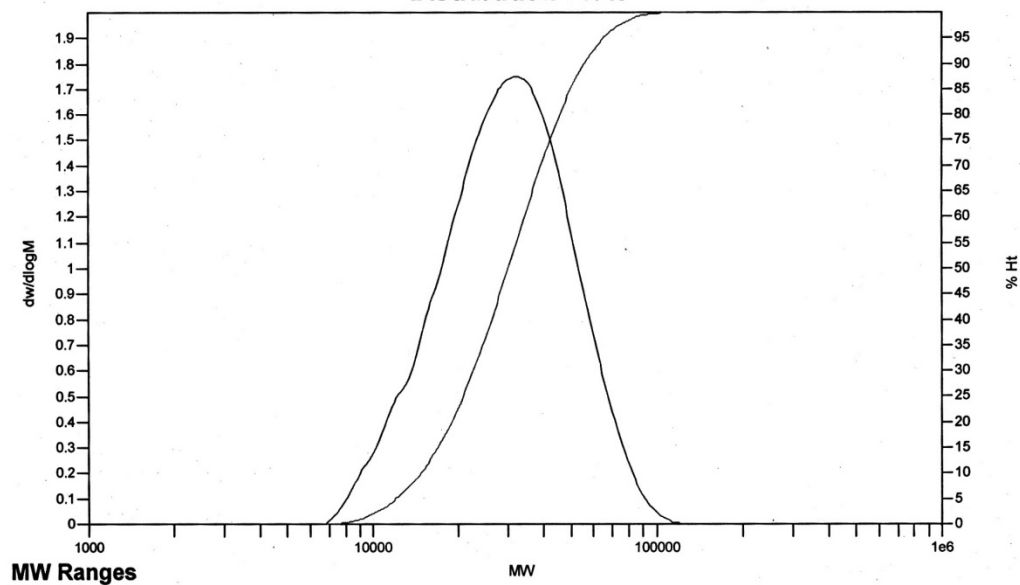


TPA4

MW Averages

Mp: 32754 Mn: 25466 Mv: 31697 Mw: 32858
Mz: 41089 Mz+1: 49428 PD: 1.2903

Distribution Plots



TPA5

MW Averages

Mp: 27917

Mn: 24084

Mv: 28753

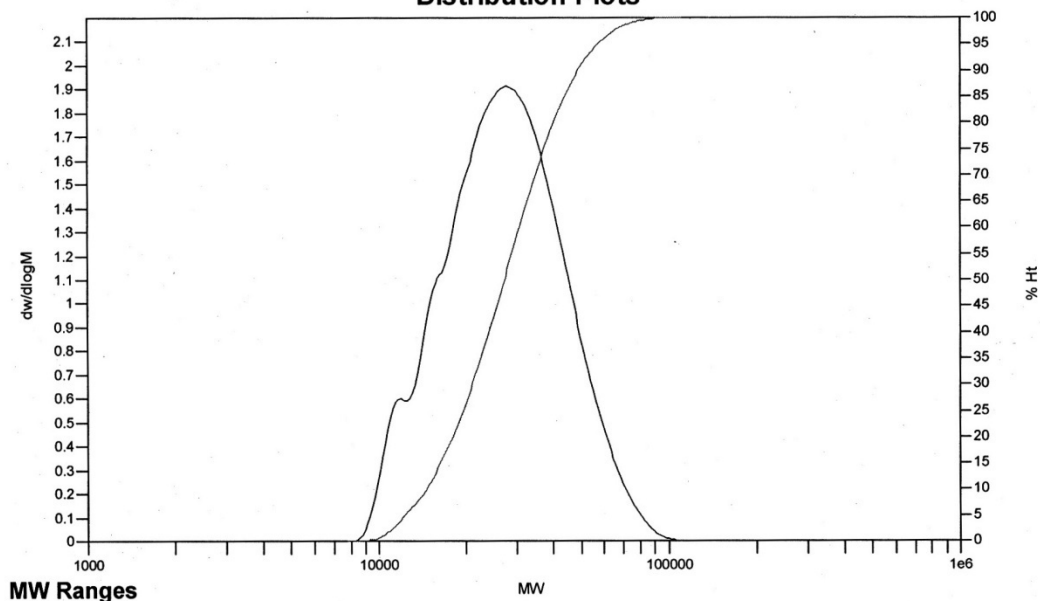
Mw: 29656

Mz: 36186

Mz+1: 43182

PD: 1.2314

Distribution Plots



TPA6

MW Averages

Mp: 31471

Mn: 26170

Mv: 31940

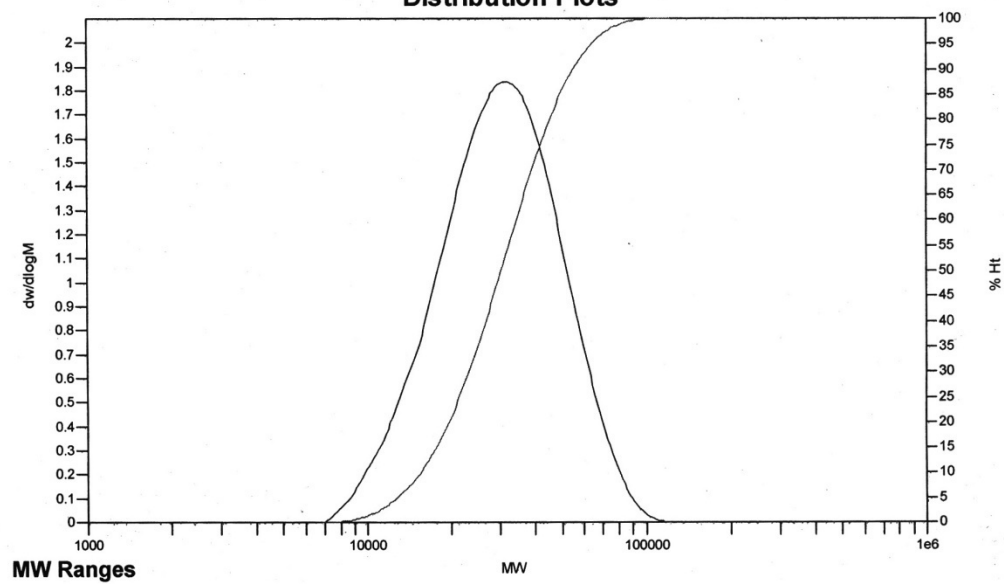
Mw: 33013

Mz: 40607

Mz+1: 48357

PD: 1.2615

Distribution Plots



DSC traces of TPA1-TPA6

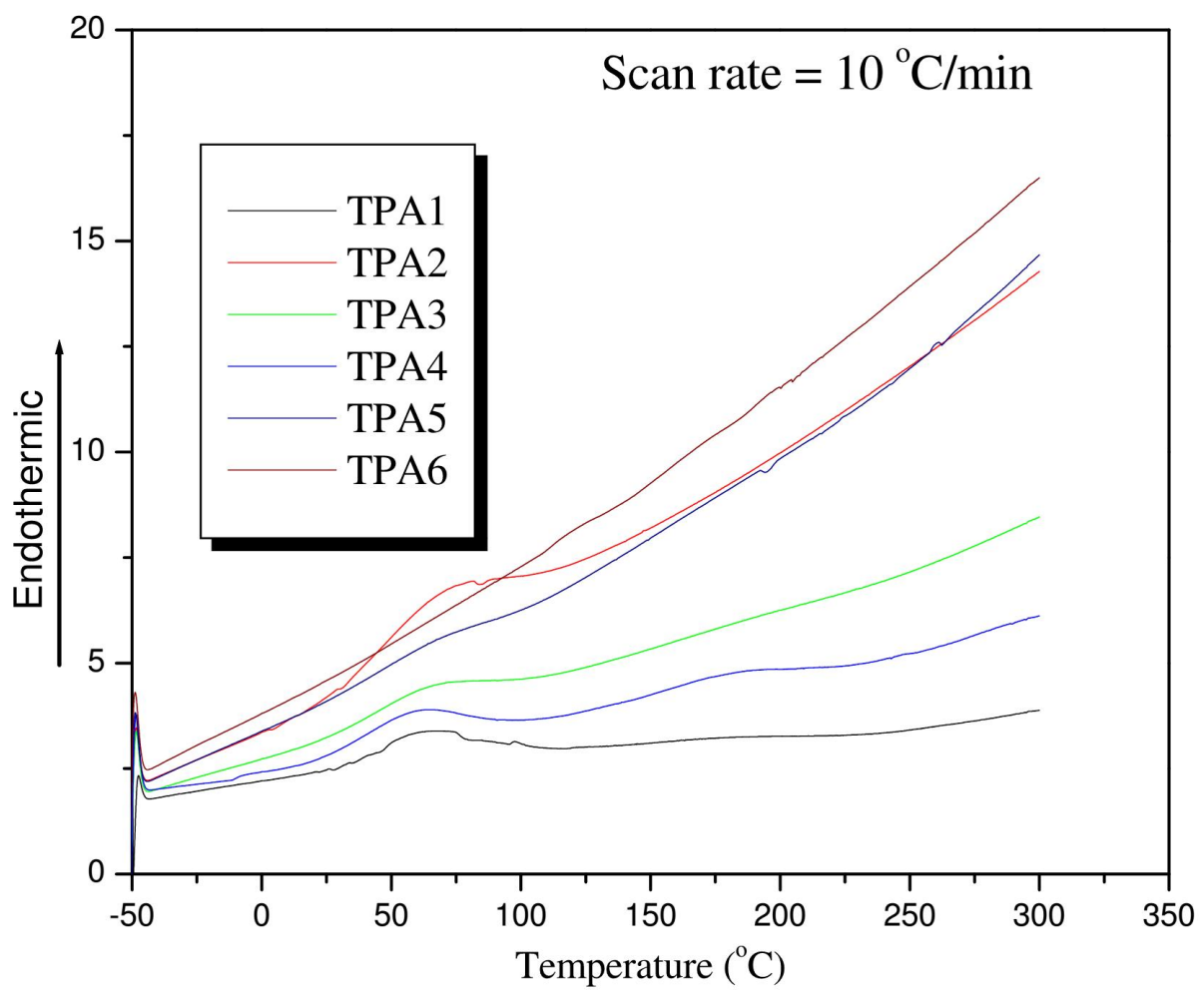


Table S1: Solubility Properties of TPA1-TPA6 in Various Solvents^a

Polymer	DMSO	DMF	DMAc	NMP	Pyridine	Acetone	THF	CHCl ₃	Toluene	CH ₃ CN	H ₂ SO ₄
TPA1	+	+	+	+	+	—	±	—	—	—	+
TPA2	+	+	+	+	+	—	±	—	—	—	+
TPA3	+	+	+	+	+	—	±	—	—	—	+
TPA4	+	+	+	+	+	—	±	—	—	—	+
TPA5	+	+	+	+	+	—	±	—	—	—	+
TPA6	+	+	+	+	+	—	±	—	—	—	+

^a Solubility measured at a polymer concentration of 0.02g/mL. (+) soluble at room temperature; (±) partially soluble at room temperature; (—) insoluble on heating. DMSO: dimethyl sulfoxide; DMF: N,N-dimethylformamide; DMAc: N,N-dimethylacetamide; NMP: N-methyl-2-pyrrolidone; THF: tetrahydrofuran.

Table S2: Comparison of TPAs with existing polyamide containing triptycene unit.

Monomer containing triptycene core.	Type	M_n (Da)	Yield (%)	PDI	η_{inh} (dL/g)	T_d in °C
1,4-Bis(4-carboxyphenoxy)triptycene and 1,4-bis(4-aminophenoxy)triptycene*	Wholly aromatic	13.5k–21.5k	quantitative	2.02–2.07	0.27–1.02	546–575
1,5-diaminotriptycene**	Wholly aromatic	Not reported	98.5–101.3	Not reported	1.04–3.24	446–486
2,6-diaminotriptycene	Wholly aromatic	25.3k–33k	97–99	1.19–1.35	0.18–0.51	428–502
	Semi aromatic	24k–26.2k	89–98	1.23–1.29	0.18–0.31	372–438

* S.-H. Hsiao, H.-M. Wang, J.-S. Chou, W. Guo, T.-H. Tsai, *J. Polym. Res.*, 2012, **19**, 9902–9909.

** Y. Kasashima, T. Kaneda, G. Saito, F. Akutsu, K. Naruchi, M. Miura, *Macromol. Chem. Phys.* **1994**, *195*, 2693–2697.