

Supporting Information

Colorless Polyimides Derived from Adamantane- containing Diamines

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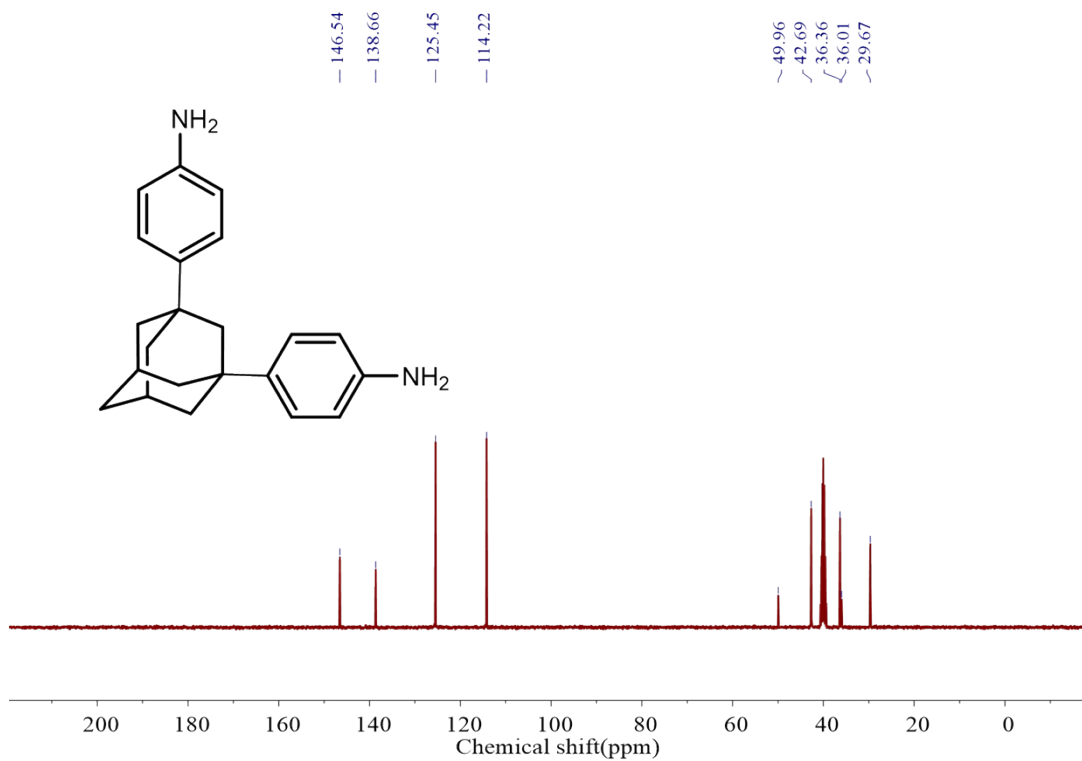


Figure S1. ¹³C NMR spectra of ADMDA

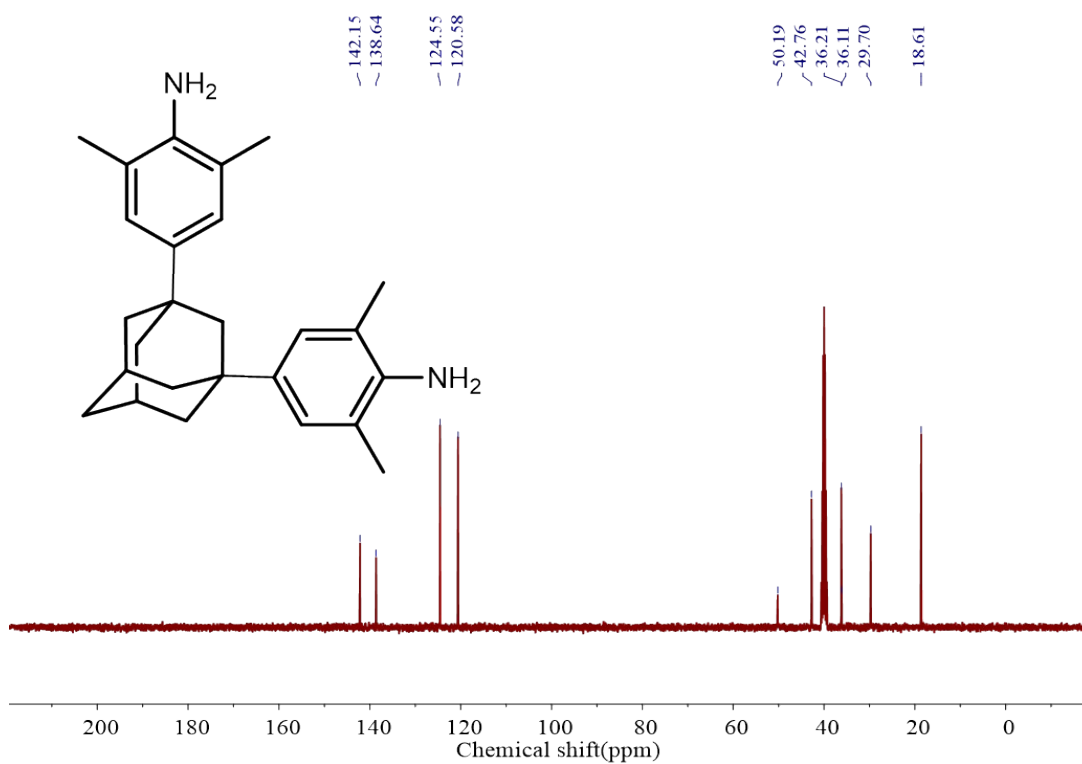


Figure S2. ¹³C NMR spectra of DMADMDA

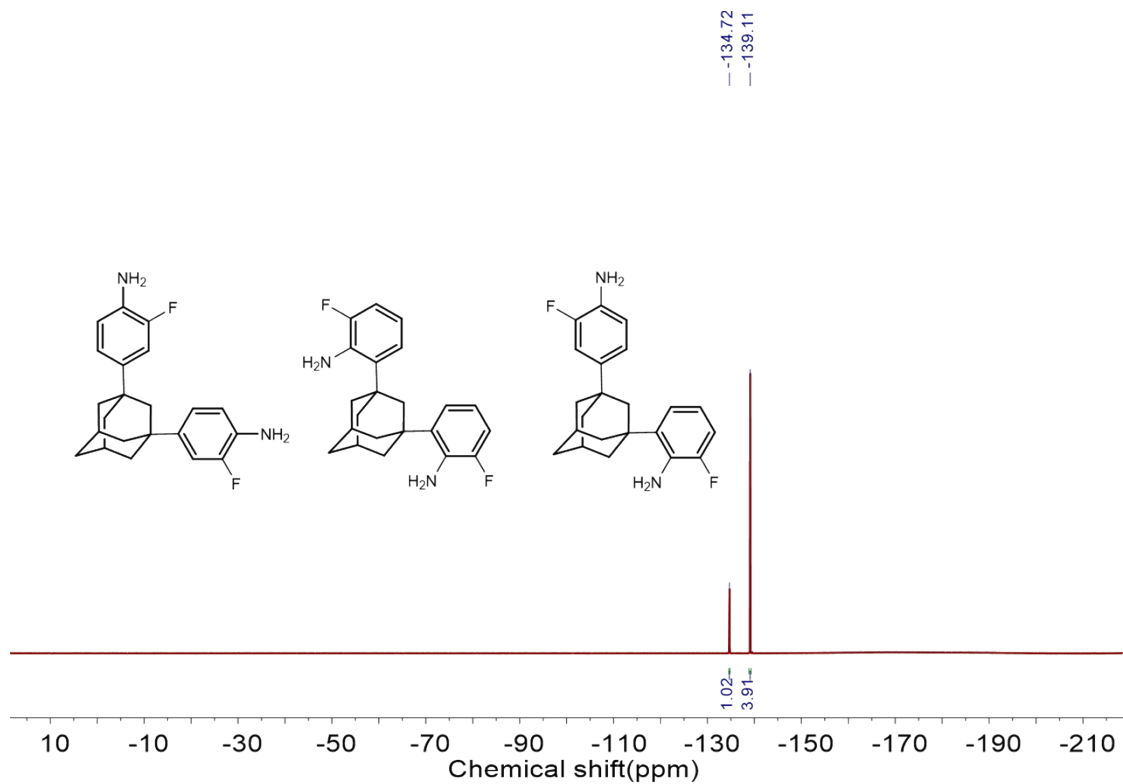


Figure S3. ^{19}F NMR spectra of FADMDA

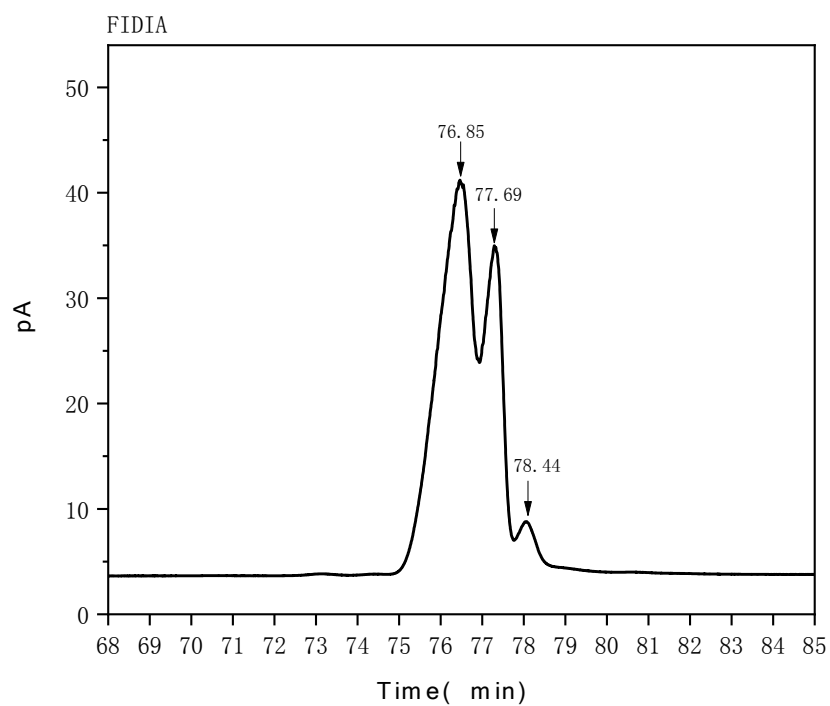


Figure S4. GC-MS chromatogram of FADMDA

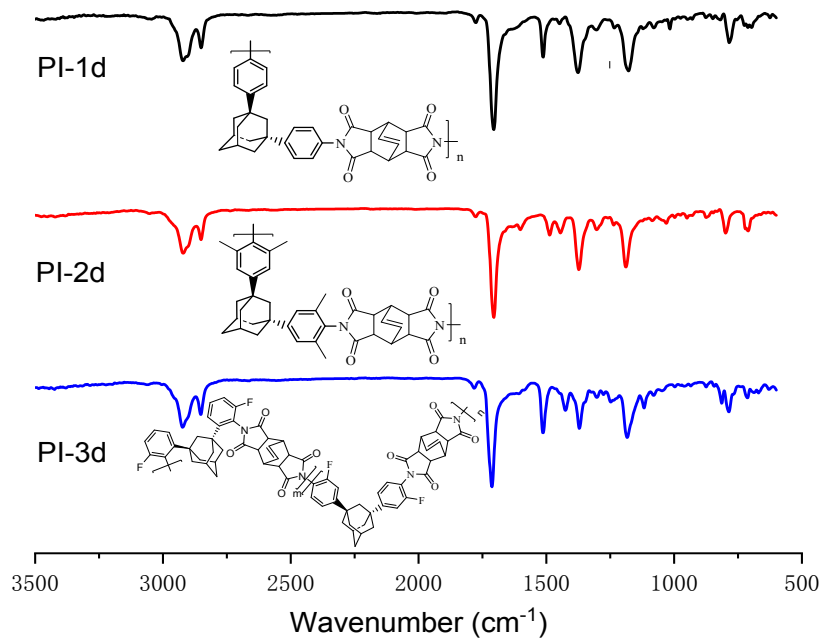


Figure S5. Representative FT-IR spectra of the adamantane-containing polyimides

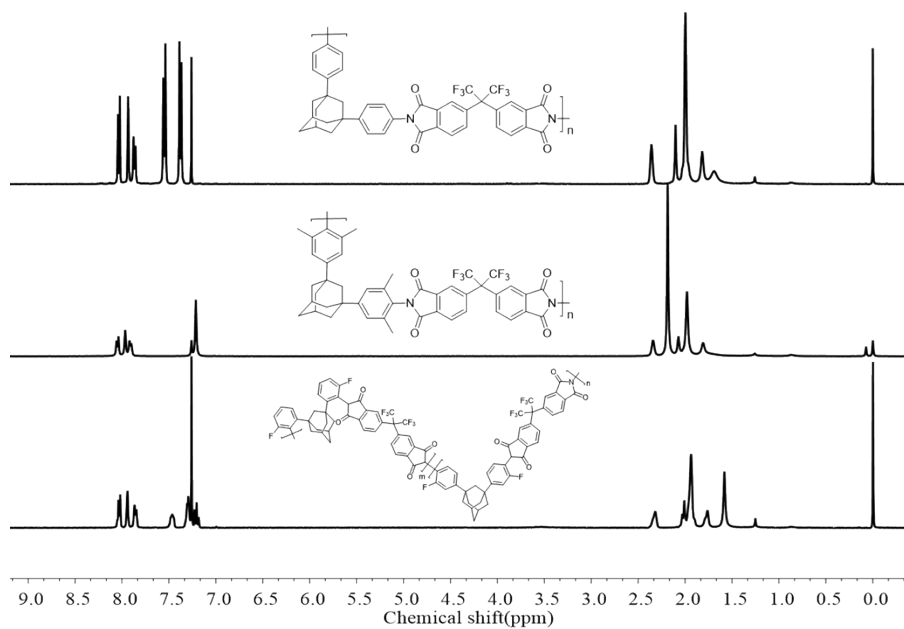


Figure S6. Representative ^1H NMR spectra of the adamantane-containing polyimides

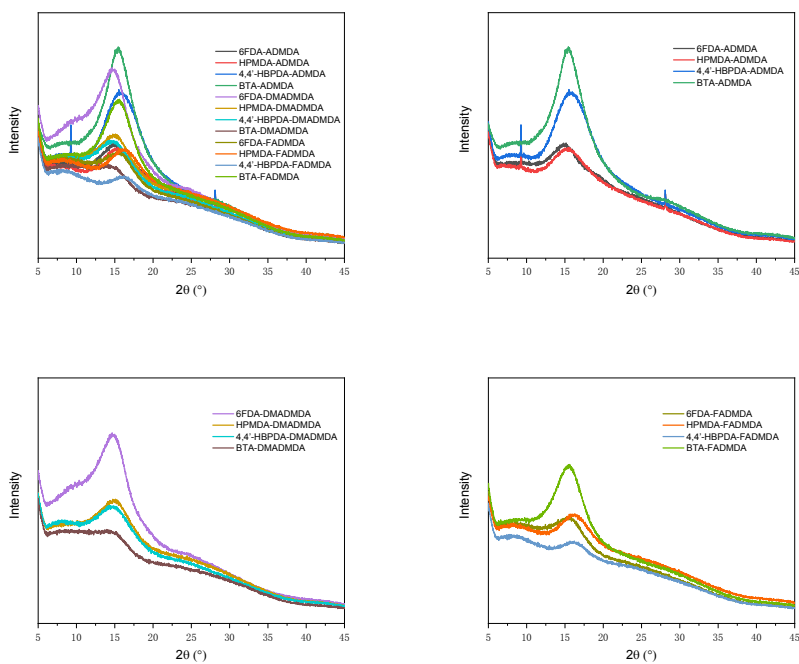


Figure S7. WAXD patterns of the adamantane-containing polyimides

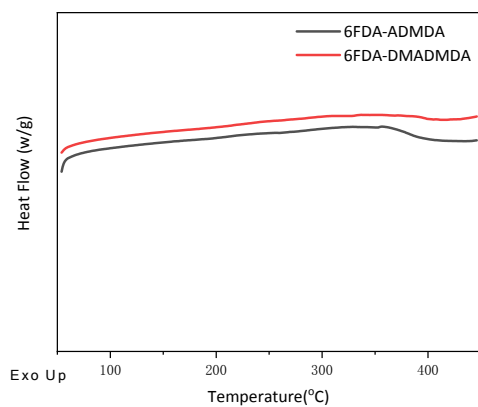


Figure S8. Representative DSC curves of the adamantane-containing polyimides

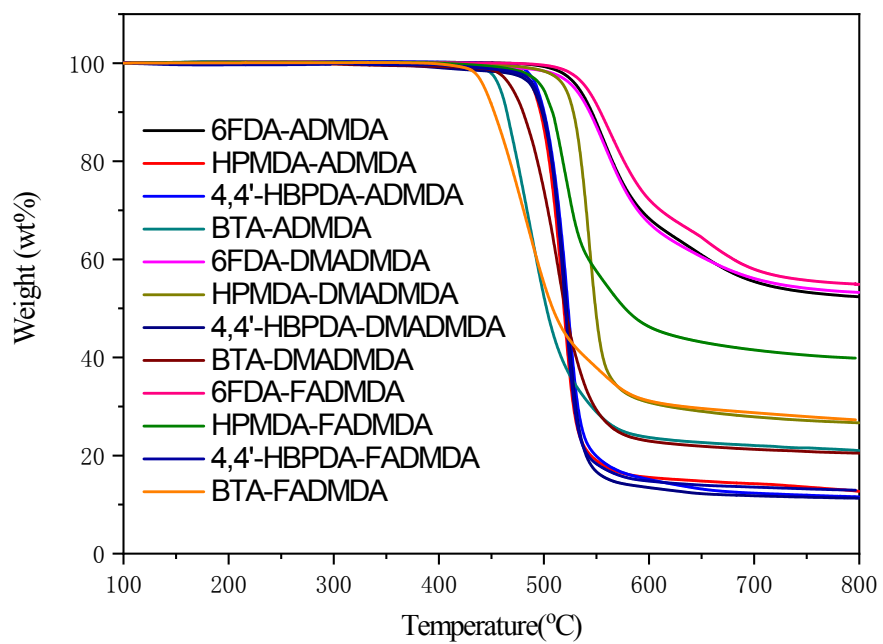
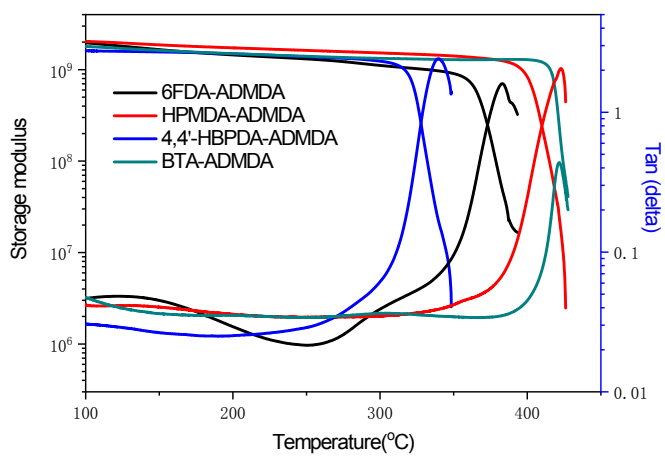


Figure S9. TGA curves of the adamantane-containing polyimides



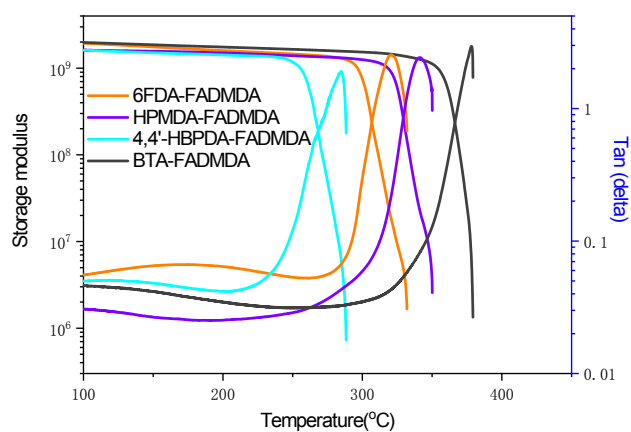
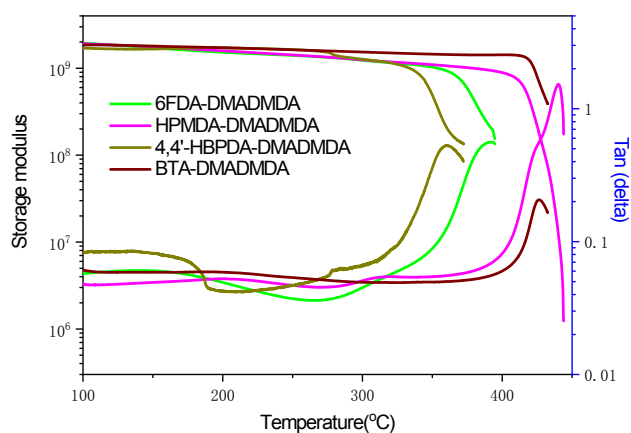


Figure S10. DMTA curves of the adamantane-containing polyimides

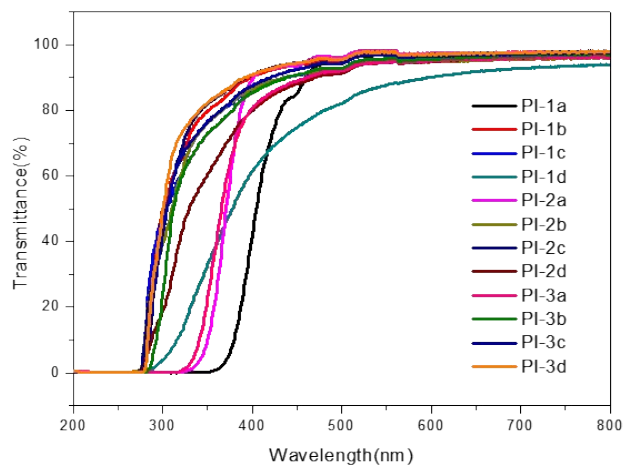


Figure S11. UV-Vis spectra of the adamantane-containing polyimides

Table S1. Inherent viscosities, molecular weights, and solubility of the adamantane-containing polyimides

Polyimides	M_w (kg mol ⁻¹)	PDI	η_{inh}^a (dL g ⁻¹)	Solubility					
				<i>m</i> -Cresol	DMF	DMAc	NMP	CHCl ₃	THF
6FDA-ADMDA	122	2.5	0.84	+	+	+	+	+	+
HPMDA-ADMDA	106	2.3	0.77	+	+	+	+	+	+/-
4,4'-HBPDA-ADMDA	110	2.1	0.80	+	+	+	+	+/-	-
BTA-ADMDA	-	-	2.16	+	+/-	+/-	+	+/-	-
6FDA-DMADMDA	186	2.4	1.12	+	+	+	+	+	+/-
HPMDA-DMADMDA	124	2.2	0.85	+	+	+	+	+	+/-
4,4'-HBPDA-DMADMDA	96	2.0	0.70	+	+	+	+	+	+/-
BTA-DMADMDA	-	-	1.98	+	+/-	+/-	+	+/-	-
6FDA-FADMDA	116	2.3	0.82	+	+	+	+	+	+/-
HPMDA-FADMDA	104	2.0	0.75	+	+	+	+	+	+/-
4,4'-HBPDA-FADMDA	97	2.1	0.73	+	+	+	+	+	+/-
BTA-FADMDA	-	-	2.04	+	+/-	+/-	+	+/-	+/-

^a: Determined at a concentration of 0.5 g dL⁻¹ in *m*-Cresol at 30 °C. +: Soluble at room temperature, +/-: Partially soluble or swelling.

Table S2. Optical properties of the adamantane-containing polyimides^a.

Polyimides	λ_{cutoff} (nm)	T_{400} (%)	lightness (L*)	Yellowness (b*)	redness (a*)	YI E313
6FDA-ADMDA	361	42	95.40	5.09	-1.69	8.33
HPMDA-ADMDA	276	90	95.20	1.98	-0.11	3.72
4,4'-HBPDA-ADMDA	275	86	94.60	3.82	-0.28	6.85
BTA-ADMDA	282	80	95.38	2.19	-0.24	4.04
6FDA-DMADMDA	331	89	95.85	2.11	-0.46	3.65
HPMDA-DMADMDA	275	86	94.19	2.31	-0.17	4.33
4,4'-HBPDA-DMADMDA	276	91	95.90	1.07	-0.05	1.99
BTA-DMADMDA	279	80	95.02	3.23	-0.24	5.96
6FDA-FADMDA	323	81	95.20	3.55	-0.37	6.44
HPMDA-FADMDA	284	86	95.01	2.61	-0.09	4.90
4,4'-HBPDA-FADMDA	279	88	94.66	3.93	-0.31	7.22
BTA-FADMDA	280	91	95.43	2.41	-0.19	4.43

^a The color parameters were calculated according to a CIE LAB equation, the film thickness was around 20-40 μ m. YI means Yellowness Index; L* refers to lightness; 100 means white, while 0 indicates black. A positive a* means red color, a negative a* indicates green color. A positive b* means yellow color, a negative b* indicates blue color. T_{400} (%) means transmittance at 400 nm.