

Electronic Supporting Information

# Iridium-catalyzed polymerization of benzoic acid and internal diyne: a new route for constructing high molecular weight polynaphthalenes without constraint of monomer stoichiometry

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**Fig. S1** IR spectra of P1a/2 obtained at different molar ratios of 1a and 2 (samples taken from Table 4, entries 1–5).

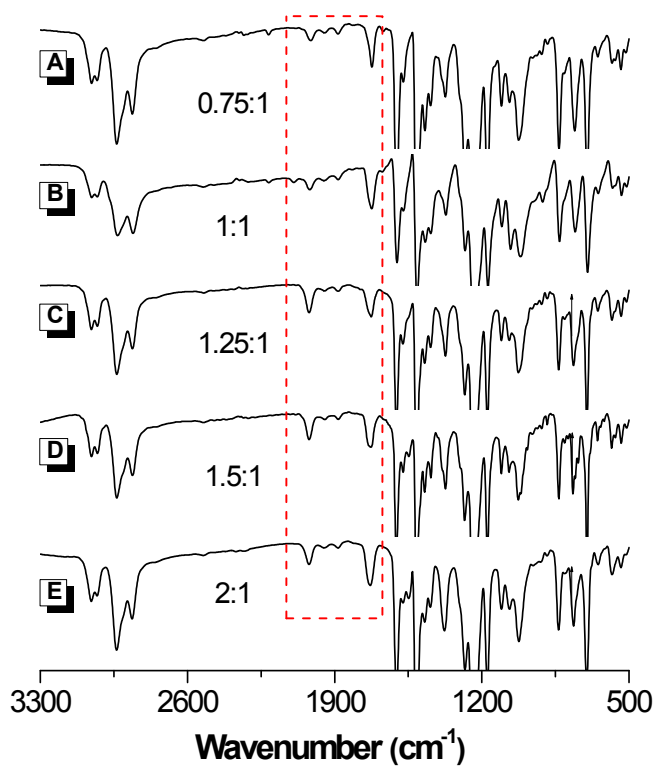
**Fig. S2** IR spectra of (A) 1a, (B) 2, (C) 4 and (D) P1a/2 (sample taken from Table 1, entry 2).

**Fig. S3** <sup>1</sup>H NMR spectra of (A) 1a in DMSO-*d*<sub>6</sub> and (B) 2, (C) 4 and (D) P1a/2 (sample taken from Table 1, entry 2) in chloroform-*d*.

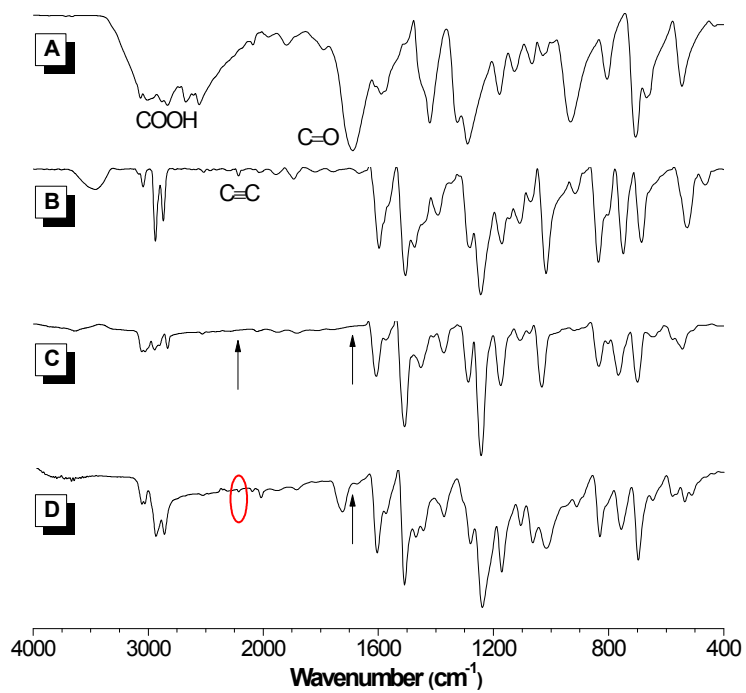
**Fig. S4** <sup>13</sup>C NMR spectra of (A) 1a in DMSO-*d*<sub>6</sub> and (B) 2, (C) 4 and (D) P1a/2 (sample taken from Table 1, entry 2) in chloroform-*d*.

**Fig. S5** Photographs of P1a/2 and P1c–e/2 in THF solutions taken under 365 nm UV irradiation from a hand-held UV lamp.

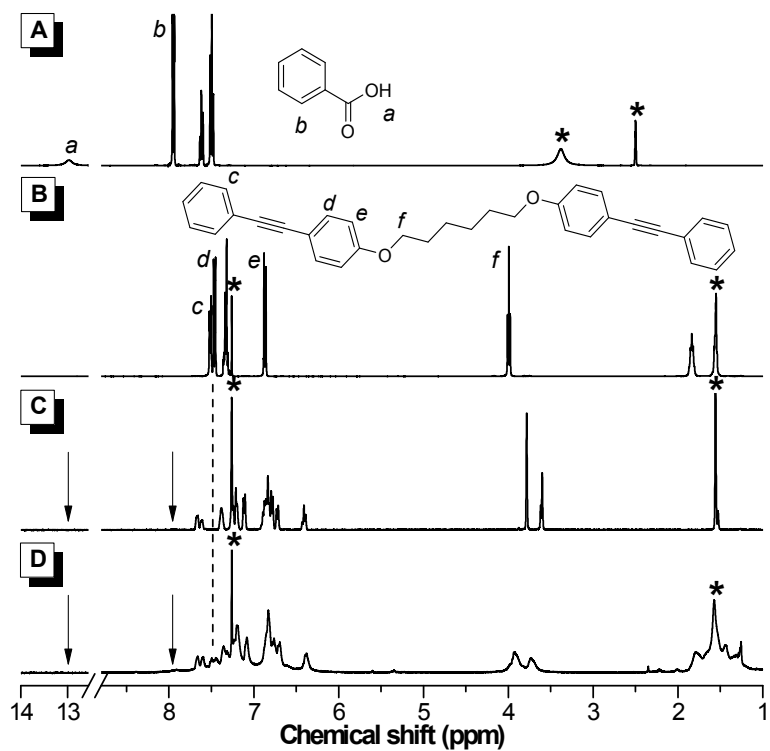
**Table S1** Refractive indices and chromatic dispersions of P1/2.



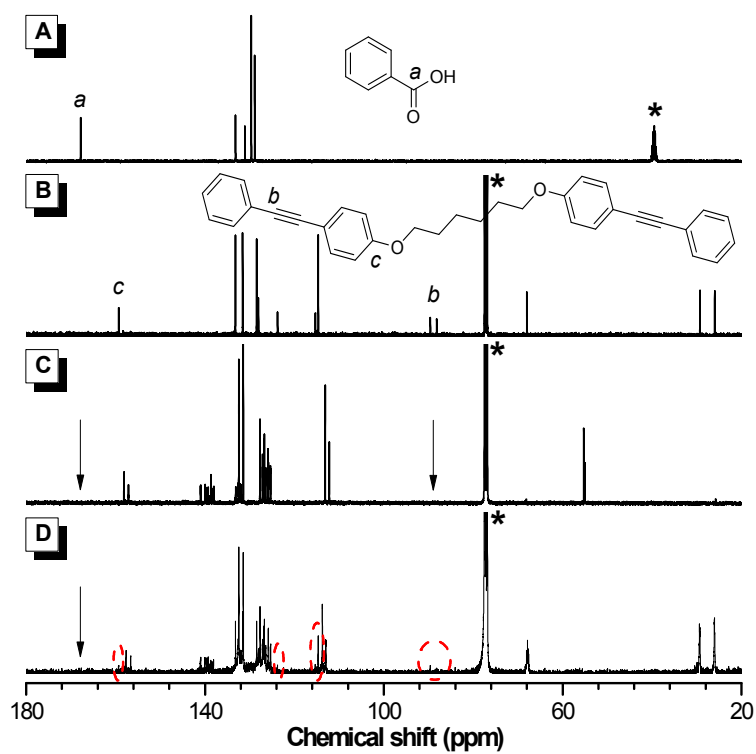
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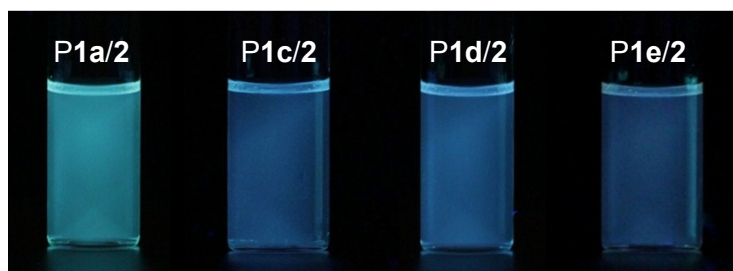
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**Fig. S3**  $^1\text{H}$  NMR spectra of (A) **1a** in  $\text{DMSO}-d_6$  and (B) **2**, (C) **4** and (D) **P1a/2** (sample taken from Table 1, entry 2) in  $\text{chloroform}-d$ .



**Fig. S4**  $^{13}\text{C}$  NMR spectra of (A) **1a** in  $\text{DMSO}-d_6$  and (B) **2**, (C) **4** and (D) **P1a/2** (sample taken from Table 1, entry 2) in  $\text{chloroform}-d$ .



**Fig. S5** Photographs of P1a/2 and P1c–e/2 in THF solutions taken under 365 nm UV irradiation from a hand-held UV lamp.

**Table S1** Refractive indices and chromatic dispersions of P1/2<sup>a</sup>

Entry	Polymer	$n_{632.8}$	$\nu_D$	$D$
1	P1a/2	1.6564	22.65	0.04415
2	P1b/2	1.6771	17.12	0.05841
3	P1c/2	1.6718	16.31	0.06131
4	P1d/2	1.6557	29.97	0.03337
5	P1e/2	1.6506	27.76	0.03602

<sup>a</sup> Samples taken from Table 6. Abbreviation:  $n$  = refractive index,  $\nu_D$  = Abbé number =  $(n_D - 1)/(n_F - n_C)$ , where  $n_D$ ,  $n_F$  and  $n_C$  are the  $n$  values at wavelengths of Fraunhofer D, F and C spectral lines of 589.2, 486.1 and 656.3 nm, respectively;  $D$  = chromatic dispersion =  $1/\nu_D$ .