Electronic Supplementary Material (ESI) for Polymer Chemistry.

Supporting Information

Postpolymerization Modification Based on Dynamic Imine Chemistry for Synthesis of Functional Polyacetylenes

Juntao Ren, [a,b] Baojian Ni,[a] Heng Liu,[a] Yanming Hu,[a*] Xuequan Zhang,[a*] and Toshio Masuda[c]

[a] CAS Key Laboratory of Synthetic Rubber, Changchun Institute of Applied Chemistry, Chinese Academy of Sciences, Changchun 130022, China

[b] University of Science and Technology of China, Hefei 230026, China

[c] College of Materials Science and Engineering, Shanghai University, Shanghai 200444, China

[*]Email: ymhu@ciac.ac.cn; xqzhang@ciac.ac.cn

Table S1 The reaction between PVM and 1-phenylethanamine at 30 ˚C.[a]

Solvent[b]	CD_3CN	THF	$CDCl_3$
Ad[c]%	100[d]	88[d]	59[d]

[a] The concentration of all the reagents was 60 mmol/L. [b] Water content below ^{1}HNMR detection limits. [c] Reaction advancement degree (%) calculated as $(I_t/I_e) \times 100$, where I_t and I_e are the normalized intensity of the CH=N signal at t = 30 min and at equilibrium, respectively. [d]PVEM at equilibrium was 28.5 mmol/L.

Table S2. Synthesis of **P1a**-**P1e** through transimination of **P1** with various amines.[a]

Amine	Product	Yield (%)	M_n[b] × 10^{-3}	M_w/M_n
(*S*)-1-phenylethanamine	**P1a**	96.5	26.2	2.6
(*R*)-1-phenylethanamine	**P1b**	95.2	24.1	2.5
(*S*)-2-amino-2-phenylethanol	**P1c**	90.5	29.1	2.8
(*S*)-1-(naphthalen-2-yl)ethanamine	**P1d**	91.7	32.7	2.7
4-amino-2,2,6,6-tetramethylpiperidine-1-oxyl	**P1e**	91.5	-[c]	-

[a] Reactions were carried out in THF at 30 °C for 12 h under nitrogen, 2.0 equiv of amine relative to the imine units in **P1**. [b] Estimated by GPC eluted with THF on the basis of polystyrene calibration. [c] insoluble in THF.

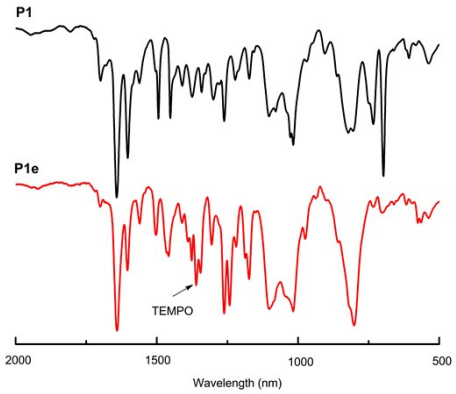


Figure S1. IR spectra of **P1** and **P1e**.

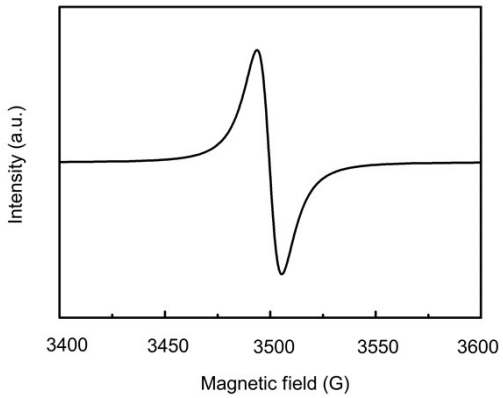
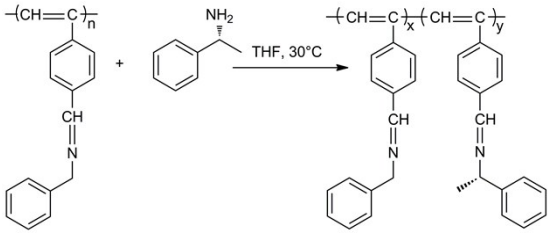


Figure S2. ESR spectrum of **P1e** measured in the powder state.



Sample	P1a-40%	P1a-50%	P1a
Reaction time/h	6	8	12
x	3	1	0
y	2	1	1

Figure S3. Synthesis of **P1a-40%, P1a-50%,** and **P1a**

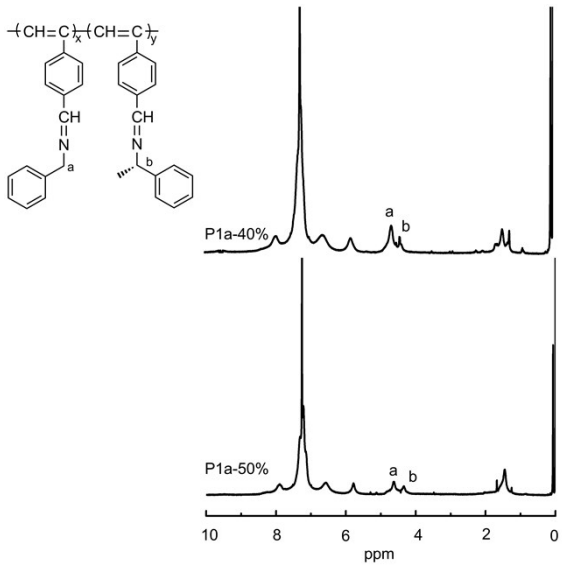


Figure S4. ^{1}H NMR spectra of **P1a-40%** and **P1a-50%**

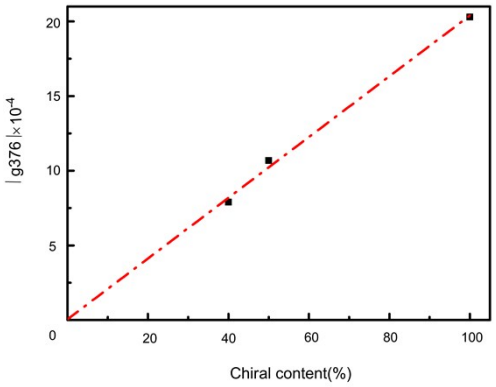


Figure S5. Plot of Kuhn dissymmetry factor (g = [θ]/(3300×ε)) at 376 nm of **P1a-40%** **P1a-50%** and **P1a** in THF against chiral content. The dotted line is shown simply to guide the eye.

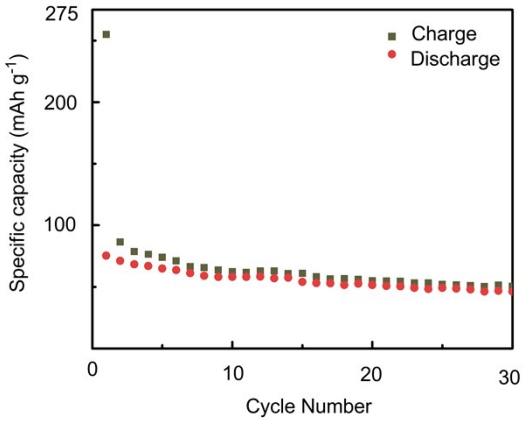


Figure S6. Dependence of capacity on the cycle number of **P1e**. Charging and discharging were repeated at a 50 mA/g current density in a range of 3.3-4.4 V cell voltage.