Supplementary information

Poly(pyridinium iodide ionic liquid)-based Electron Injection Layer for Solution-processed Organic Light-emitting Devices

Satoru Ohisa,* Yong-Jin Pu and Junji Kido*

Department of Organic Materials Science, Graduate School of Organic Materials Science, Yamagata University, Yonezawa, Yamagata, 992-8510 Japan.

E-mail: s.ohisa@yz.yamagata-u.ac.jp; kid@yz.yamagata-u.ac.jp

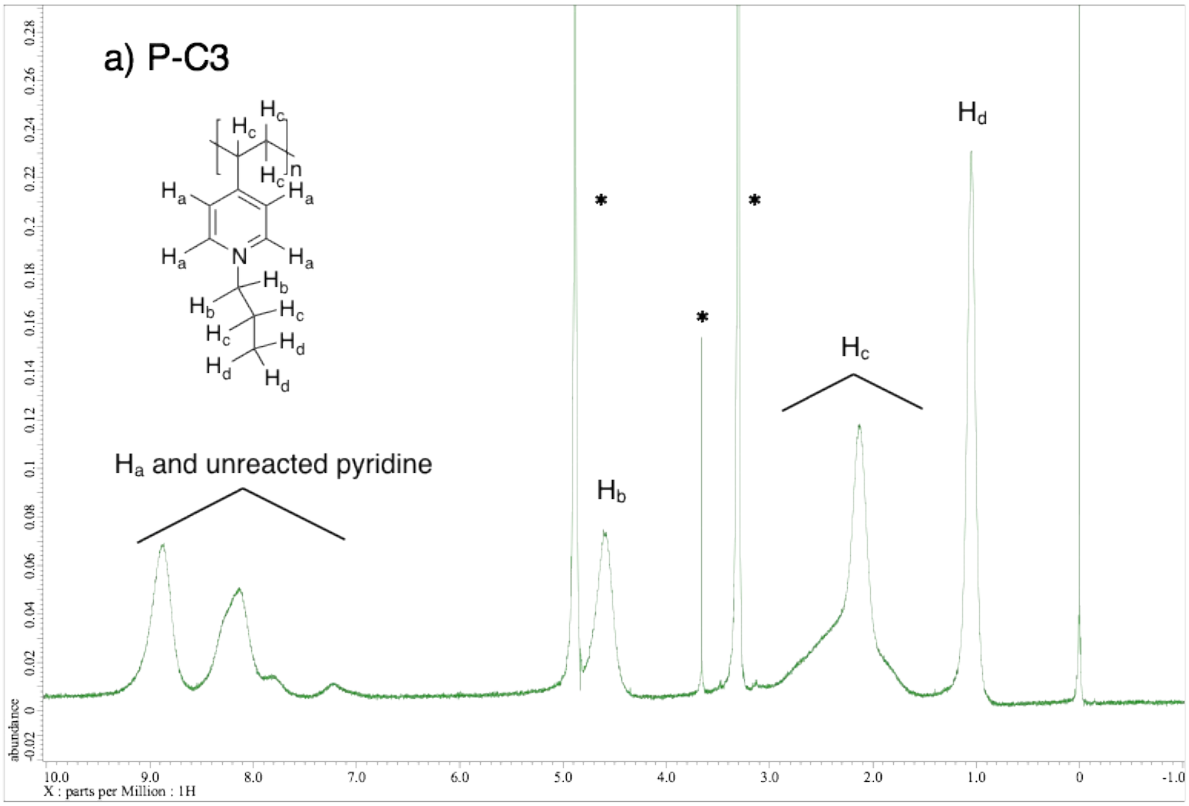
Table S1. The results of the solubility test of PILs at a concentration of 1 mg/mL.

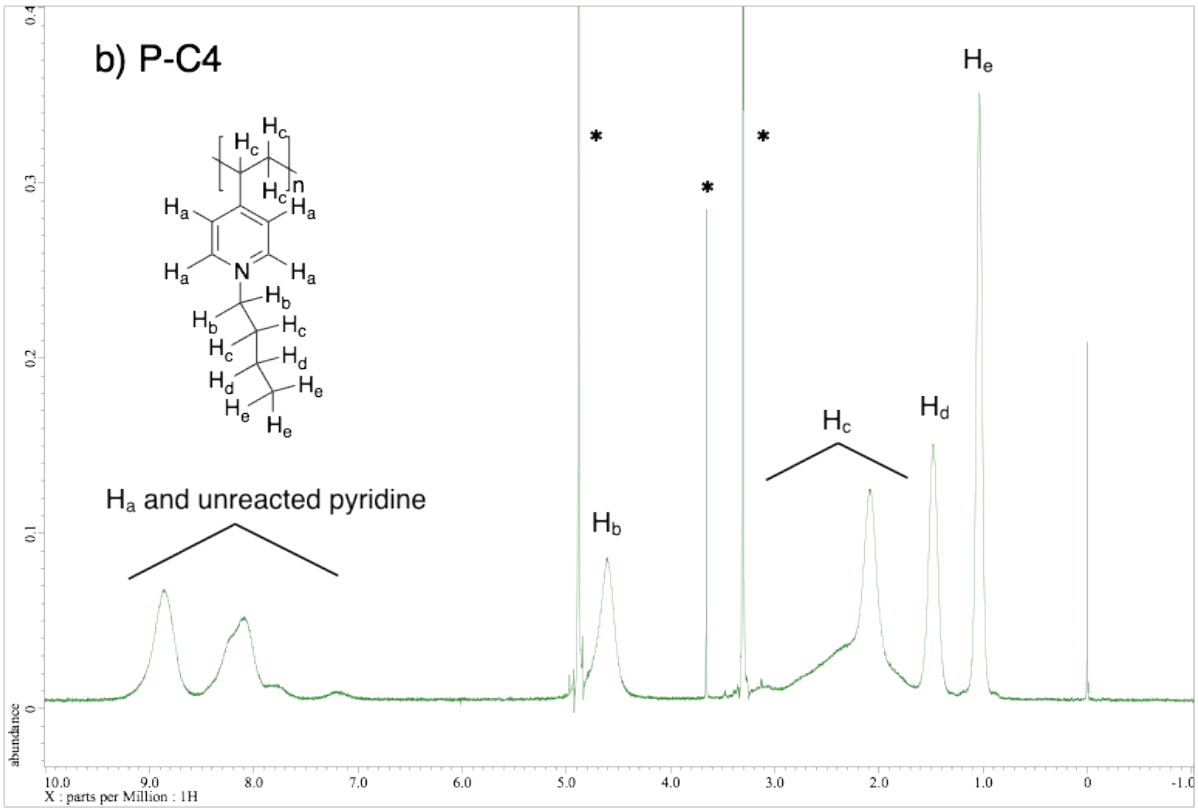
○: dissolution. ×: not dissolution.

Solvent	ε[a]	Kosower Z[b]	P-C3	P-C4	P-C6
Water	80.2	94.6	○	×	×
Methanol	32.7	83.6	○	○	○
Ethanol	24.6	79.6	×	×	○
2-propanol	19.9	76.3	×	×	×
Acetonitrile	35.9	71.3	×	×	○
Dichloromethane	8.9	64.2	×	×	○
Chloroform	4.8	63.2	×	×	○
Tetrahydrofuran	7.6	58.8	×	×	×
Pyridine	12.9	64.0	×	×	○
Hexane	1.9	−	×	×	×
Cyclohexane	2.0	60.1	×	×	×
Toluene	2.4	−	×	×	×

[a]Dielectric constant at 20˚C;[1] [b]Kosower's solvent parameter derived from the wavelength of the charge-transfer band in the visible spectrum of 1-ethyl-4-methoxycarbonylpyridinium iodide ($Z = 2.859\times10^4/\lambda$ where λ is the position of the absorption maximum in nanometers)[1]

Synthesis of the PILs





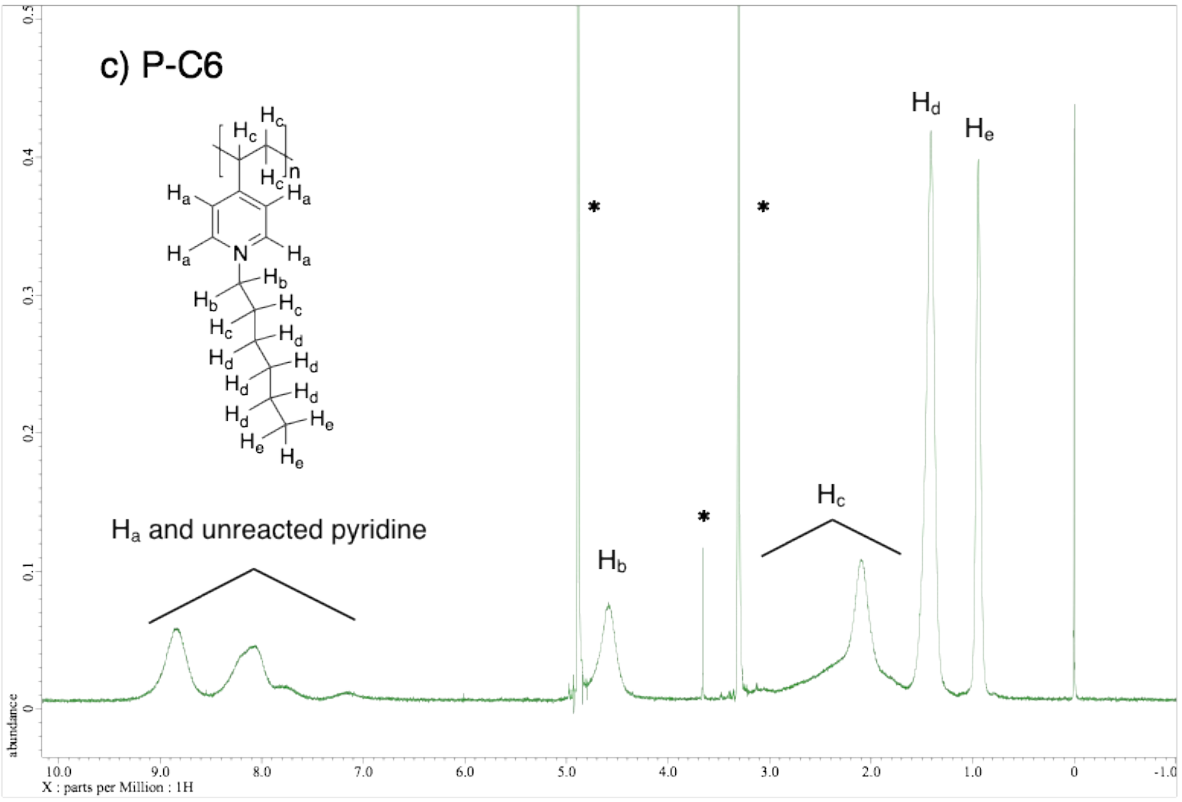


Figure S1. ^{1}H-NMR spectra of PILs in methanol-d_4. a) P-C3. b) P-C4. c) P-C6. Asterisks were derived from methanol-d_4 or 1,4-dioxane.

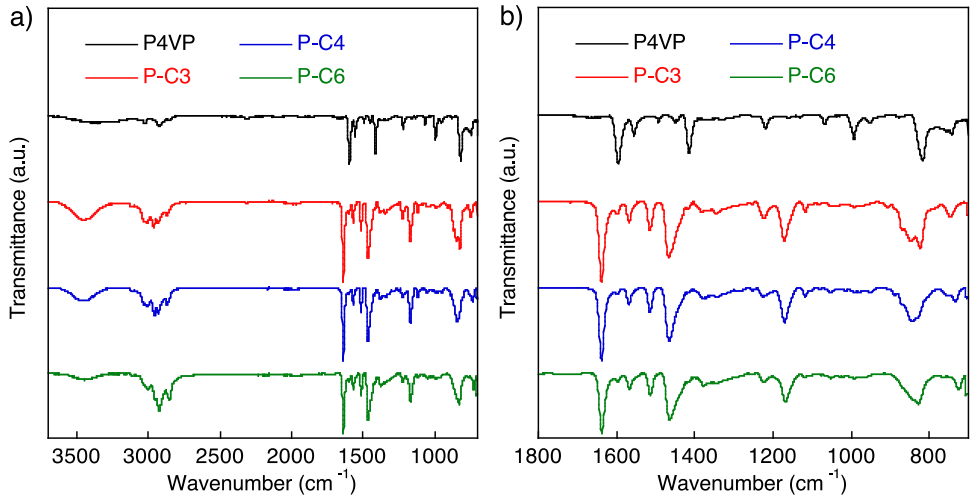


Figure S2. IR spectra of P4VP and PILs powder. a) Whole spectra. b) Expanded spectra in low wavenumber region.

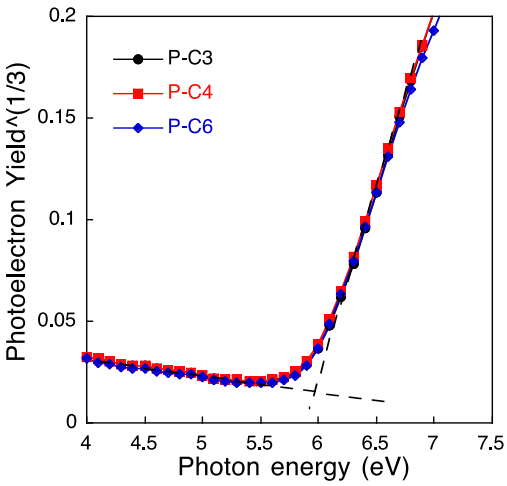


Figure S3. PYS spectra of PIL films.

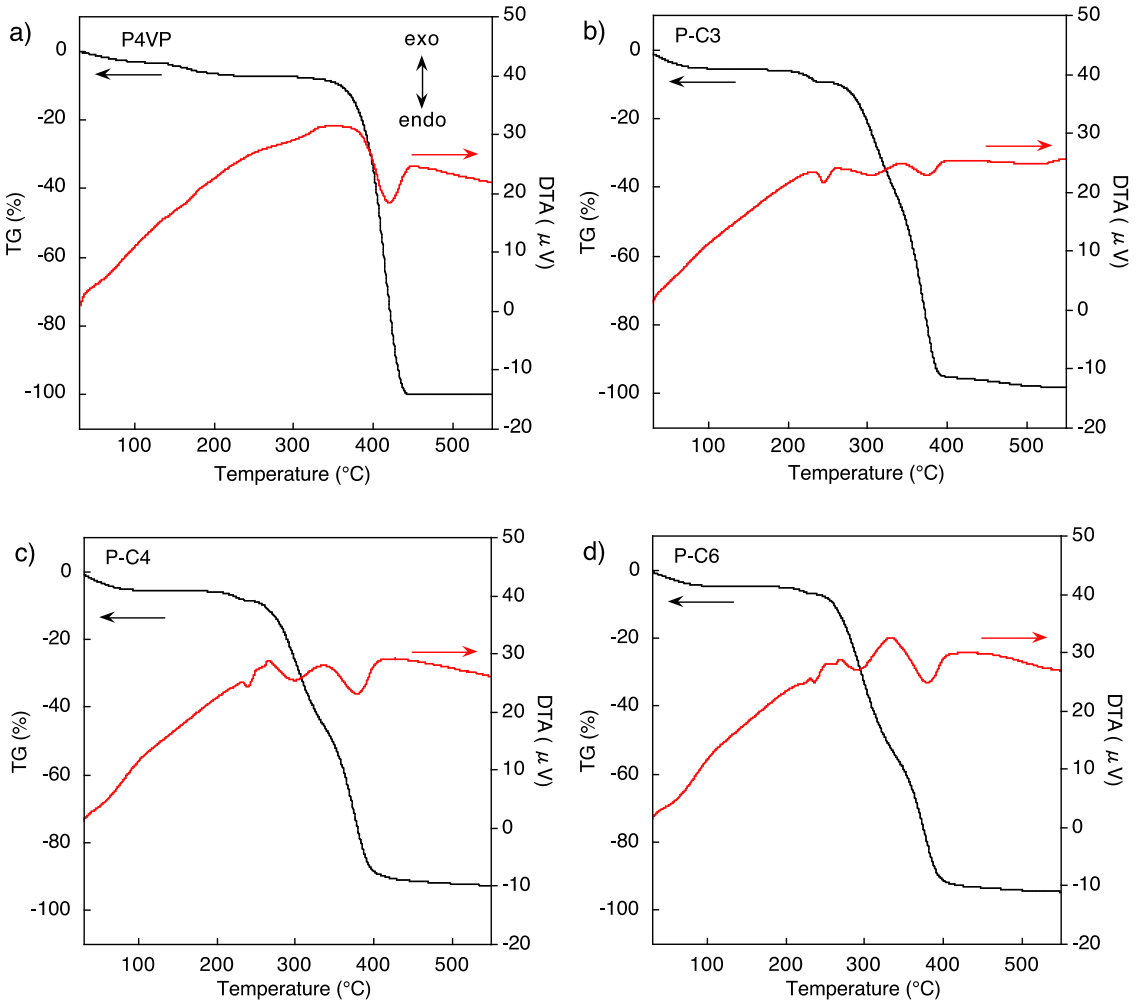


Figure S4. TG and DTA curves of a) P4VP, b) P-C3, c) P-C4, and d) P-C6.

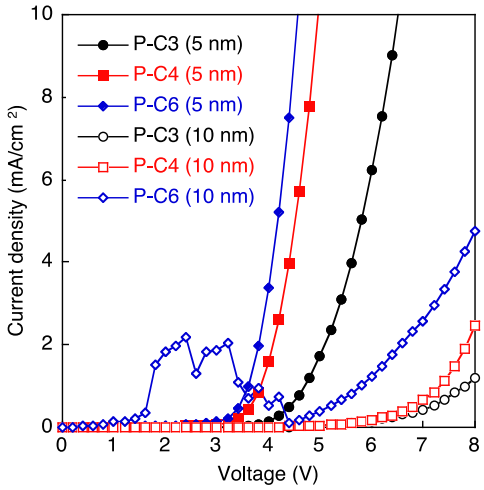


Figure S5. The PIL thickness influences on current density–voltage characteristics of OLEDs.

1. M. Montalti, A. Credi, L. Prodi and M. T. Gandolfi, *Handbook of photochemistry*, CRC/Taylor & Francis, Boca Raton, 3rd edn., 2006.