

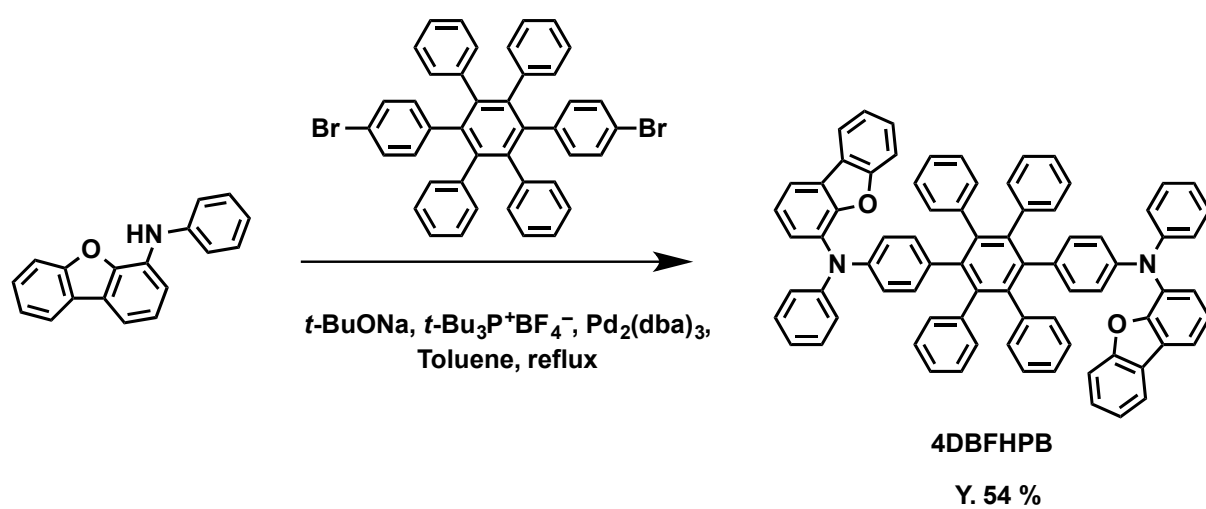
Supporting Information

Simultaneous Realization of High-Efficiency, Low-Drive Voltage, and Long Lifetime TADF OLEDs by Multifunctional Hole-Transporters

By Takahiro Kamata, Hisahiro Sasabe, Nozomi Ito, Yoshihito Sukegawa, Ayato Arai, Takayuki Chiba, Daisuke Yokoyama, and Junji Kido**

Department of Organic Materials Science, Graduate School of Organic Materials Science, Yamagata University, Research Center of Organic Electronics (ROEL), Frontier Center for Organic Materials (FROM), Yamagata University, 4-3-16 Jonan, Yonezawa, Yamagata 992-8510, Japan

E-mail: h-sasabe@yz.yamagata-u.ac.jp; kid@yz.yamagata-u.ac.jp



Scheme S1. Synthetic route of **4DBFHPB**.

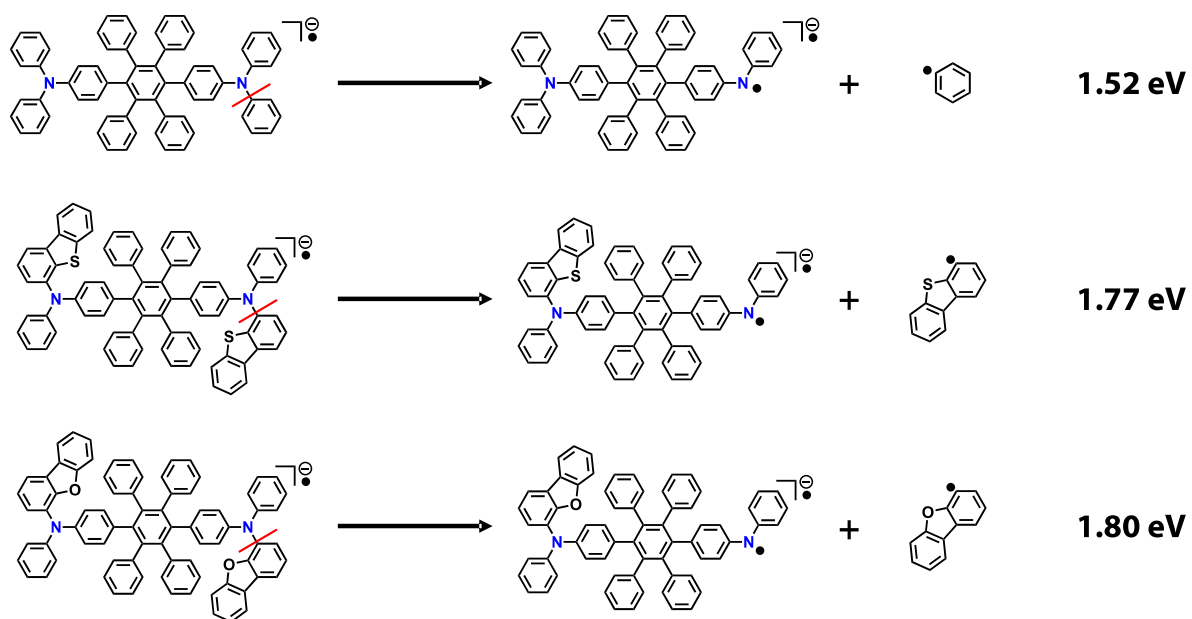


Figure S1. BDEs of HPB derivatives for the anion states calculated at the URB3LYP 6-31G(d) level of theory.

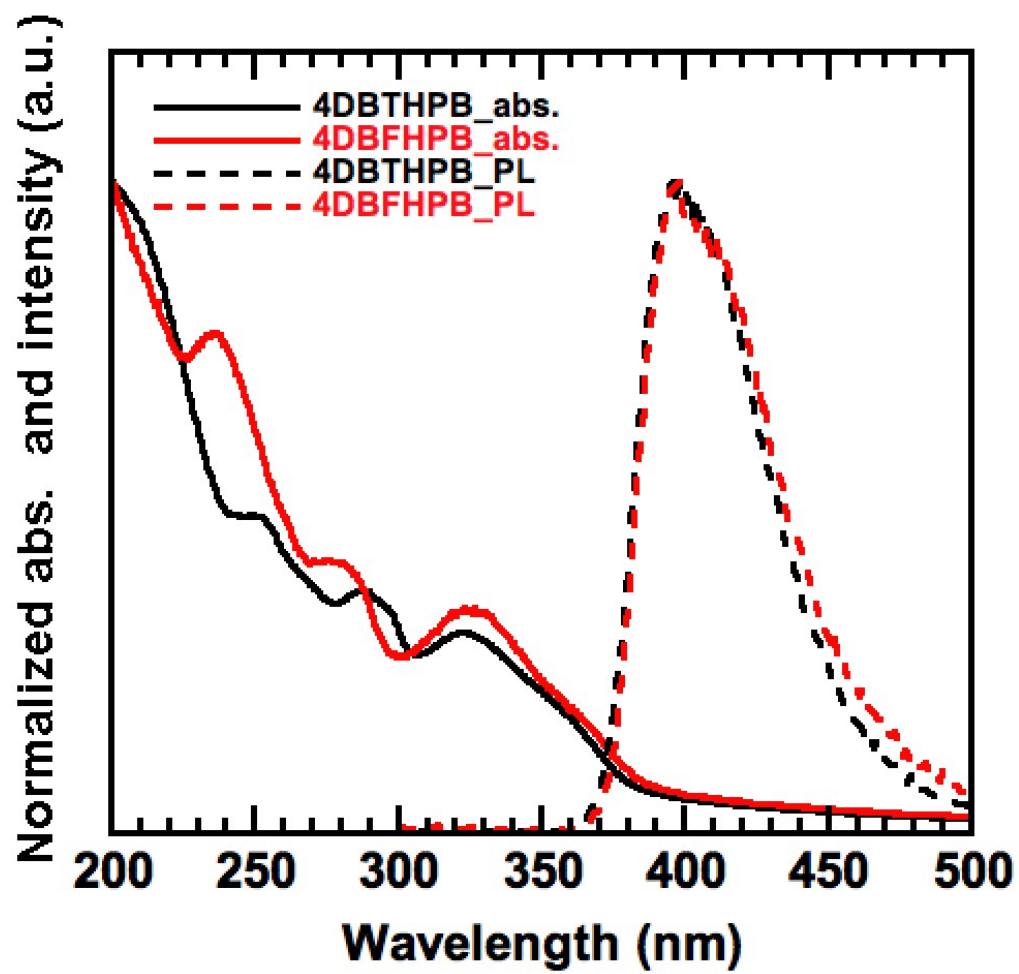


Figure S2. UV-vis absorption spectra and PL spectra of **4DBFHPB** films.

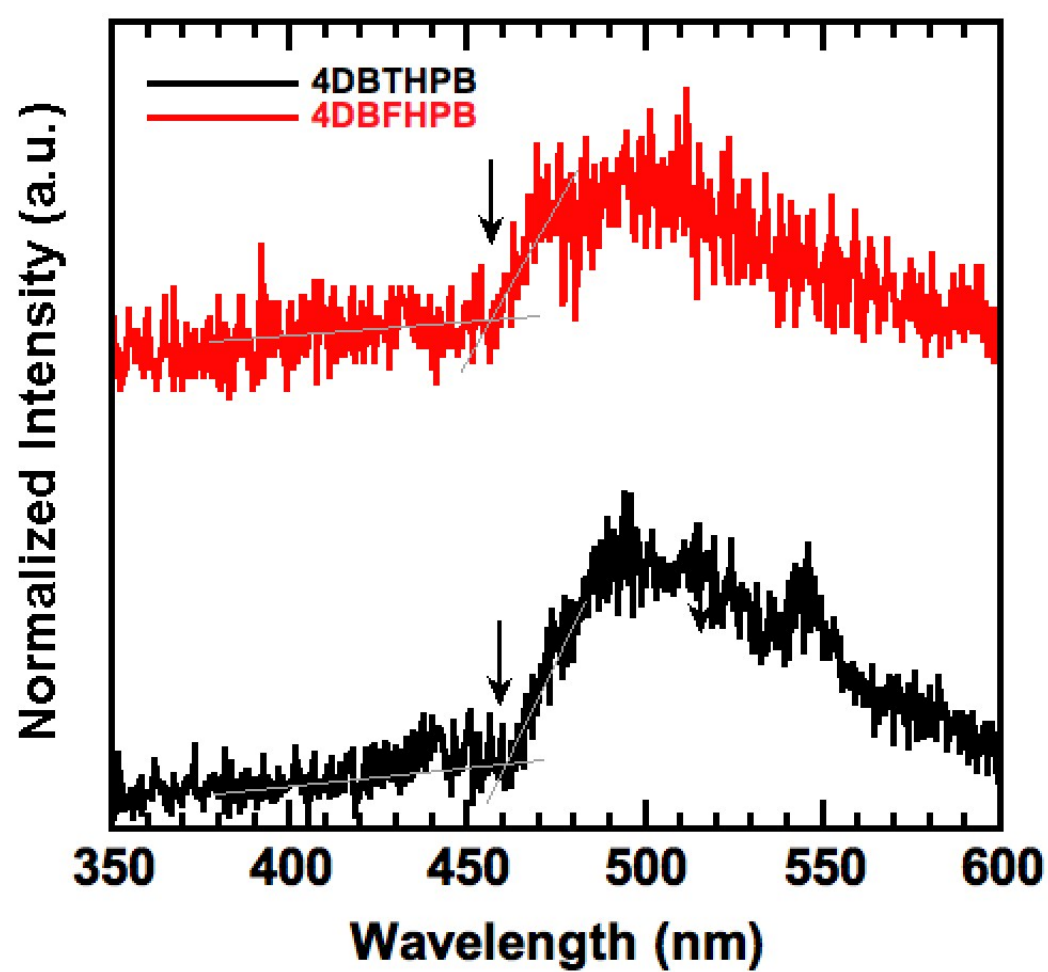


Figure S3. Phosphorescent spectra of **4DBFHPB** and **4DBTHPB** films at 5 K.

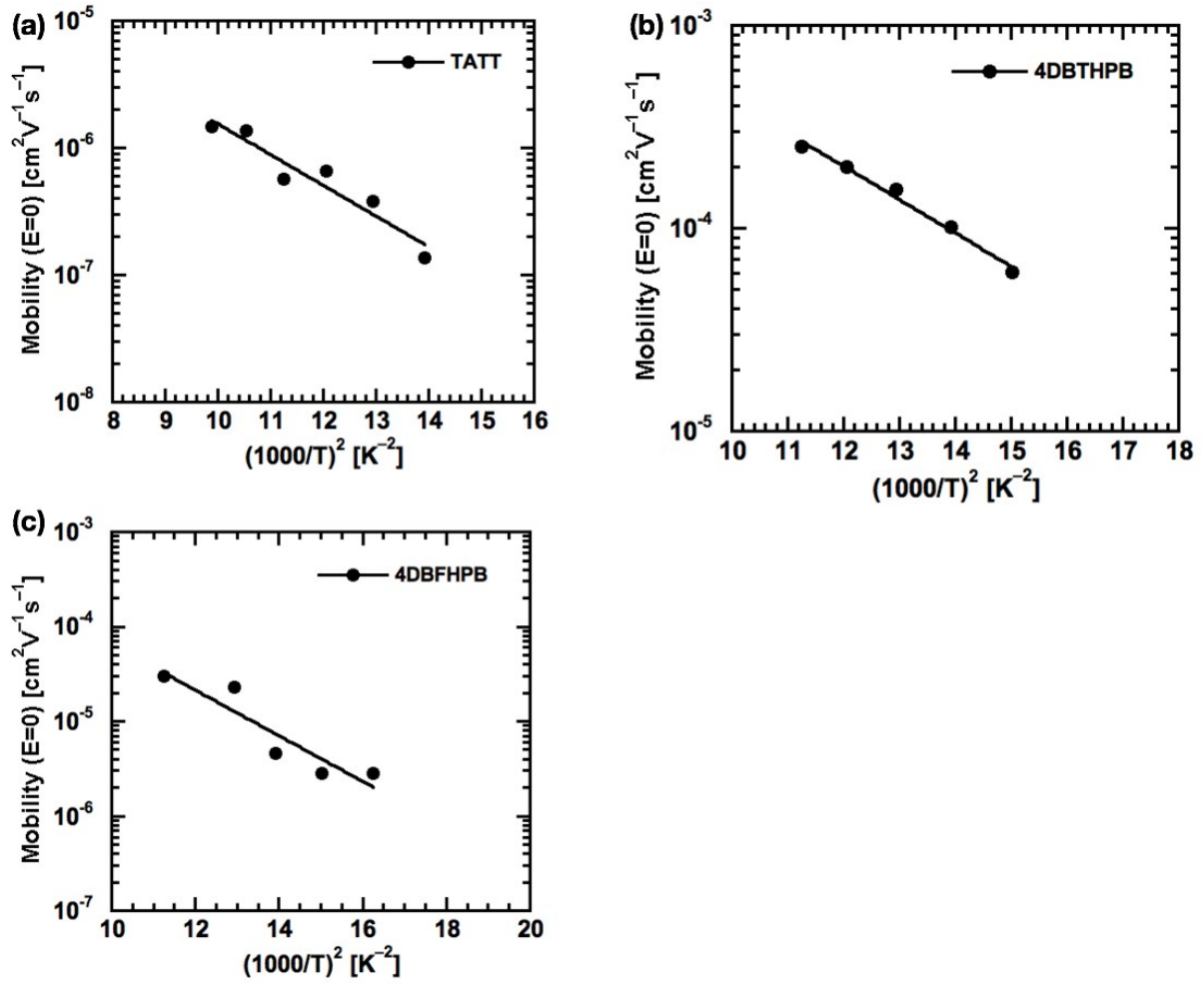


Figure S4. Plot of the zero-field mobility $\mu(E = 0)$ vs $(1000/T)^2$: a) TATT; b) 4DBTHPB; c) 4DBFHPB.

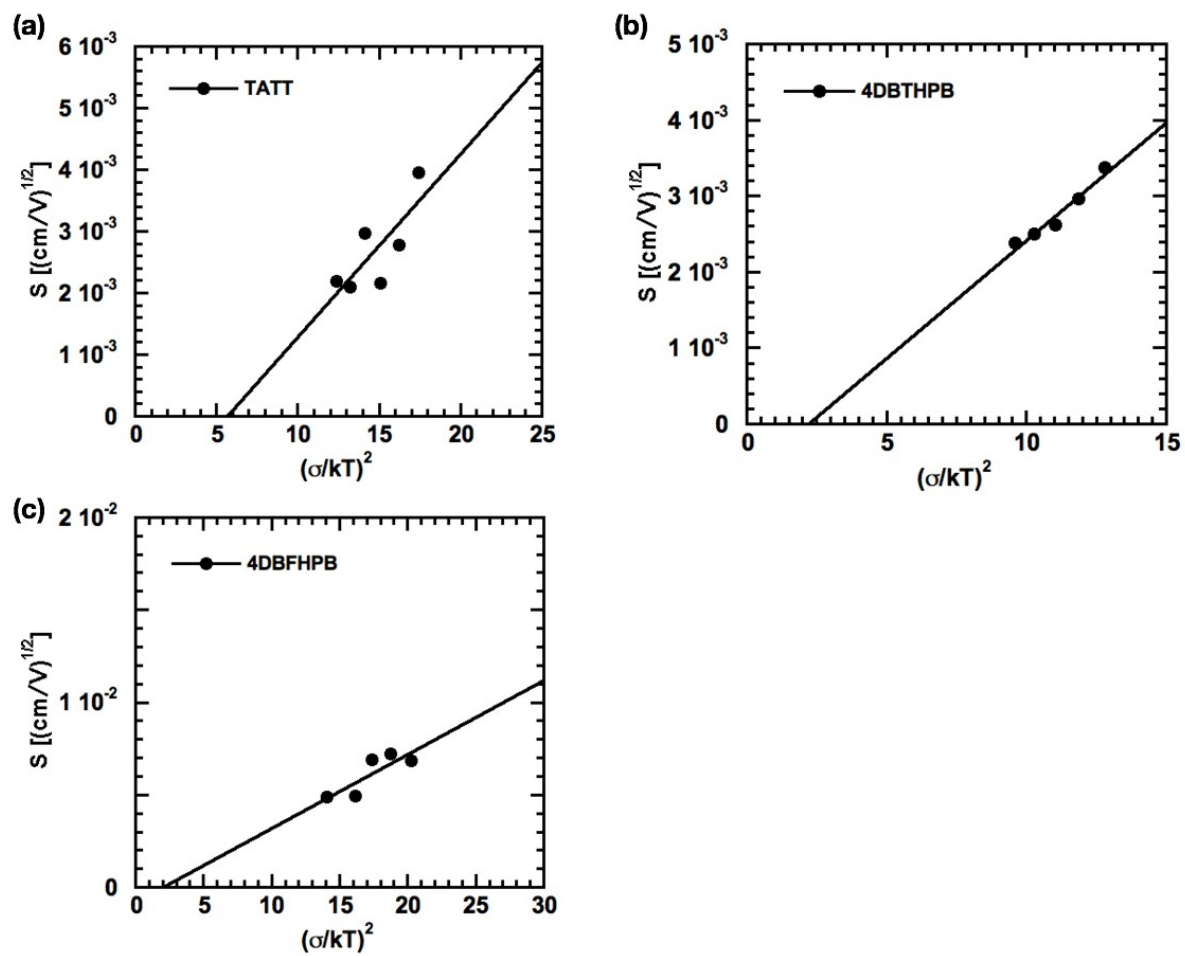


Figure S5. Plot of S vs $(\sigma/kBT)^2$: a) TATT; b) 4DBTHPB; c) 4DBFHPB.

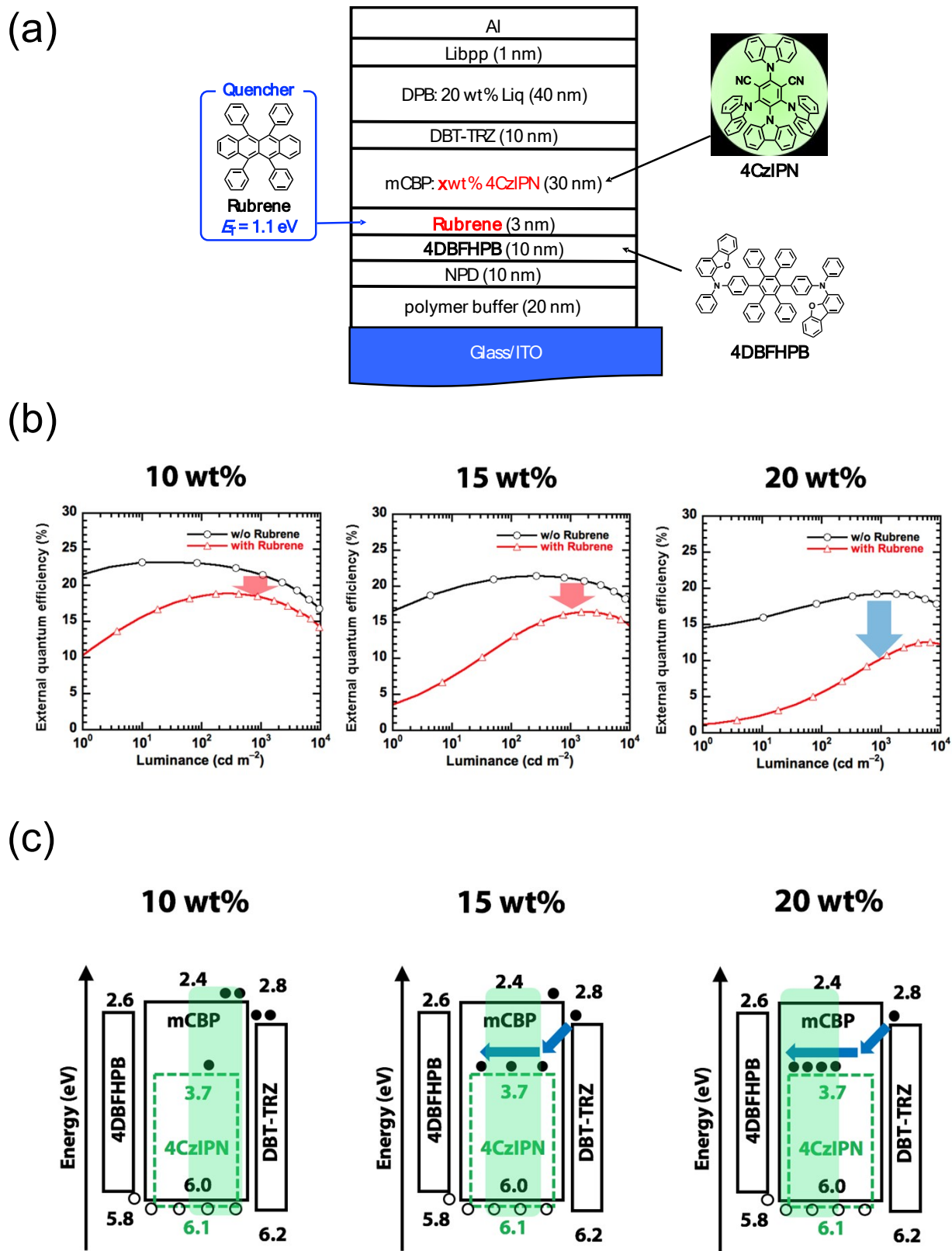


Figure S6. (a) Device structure, (b) $\eta_{\text{ext}}-L$ characteristics, and (c) emission zone of rubrene-inserted devices with different doping ratio.

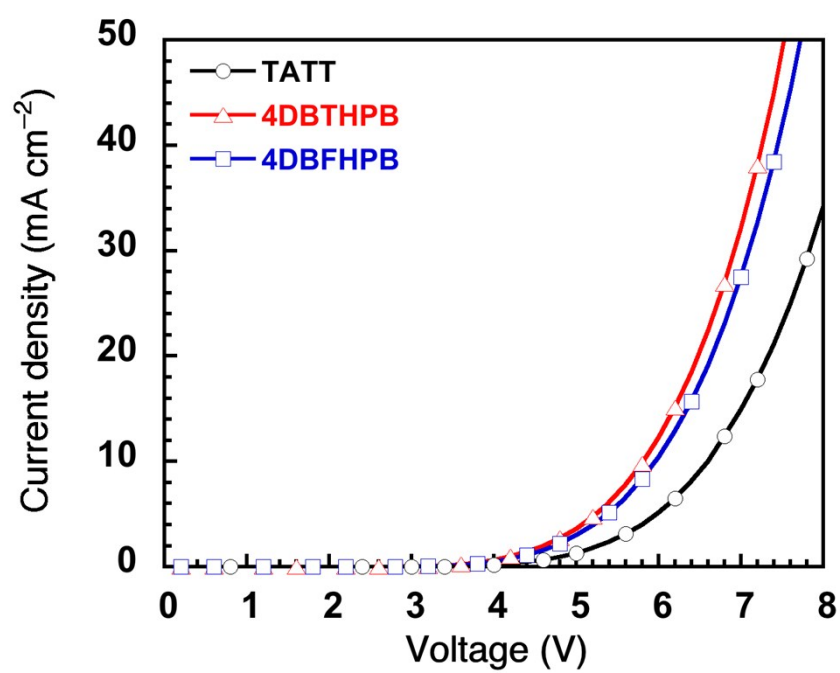


Figure S7. J – V characteristics of hole-only devices.