Supporting information

Correlation of the substitution position of diphenylphosphine oxide on phenylcarbazole and device performances of blue phosphorescent organic light-emitting diodes

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General analysis

The $^1$H and $^{13}$C nuclear magnetic resonance (NMR) spectra were recorded on a Varian 200 (200 MHz) spectrometer. The photoluminescence (PL) spectra were recorded on a fluorescence spectrophotometer (HITACHI, F-7000) and the ultraviolet-visible (UV-Vis) spectra were obtained using UV-vis spectrophotometer (Shimadzu, UV-2501PC). Samples were dissolved in THF at a concentration of $1.0 \times 10^{-4}$ M. The differential scanning calorimetry (DSC) measurements were performed on a Mettler DSC 822 under nitrogen at a heating rate of 10°C/min. The mass spectrometry (MS) was performed using a JEOL, JMS-AX505WA spectrometer in FAB (fast atom bombardment) mode. Cyclic voltametry measurement of organic materials was carried out in acetonitrile solution with tetrabutylammonium perchlorate at 0.1 M concentration. Ag was used as the reference electrode and Pt was the counter electrode. Organic materials were coated on indium tin oxide substrate and were immersed in electrolyte for analysis. Scan rate was 0.1 mV/s. Elemental analysis of the materials was carried out using EA1110 (CE instrument). High performance liquid chromatography (HPLC) analysis of the synthesized materials was carried out using HPLC from Youngrin Instrument. A mixed eluent of acetonitrile:methanol (90:10) was used for the analysis. Absolute PL efficiency of the emitting layer was measured using an integrating sphere excited by He/Cd laser (325 nm). Transient PL analysis of the
deposited film was carried out using Nd:YAG pulse laser.
Figure S1 Molecular orbital simulation results of PPO27 and PPO36.
Figure S2. Cyclic voltametric curve of PPO27 and PPO36.