Supplementary Materials: An Easy Approach to Control β-Phase Formation in PFO Films for Optimized Emission Properties

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Calculation of β-phase Fraction

The absorption spectra of mixed-phase PFO films are understood to comprise a linear superposition of glassy and β-phase contributions. To estimate the fraction of β-phase chain segments (hereafter simply referred to as "β-phase fraction") in a PFO thin film, the absorption spectrum of the β-phase chain segments was extracted by normalizing the corresponding mixed phase and reference glassy absorption spectra at ~345 nm, followed by subtraction. The β-phase fraction is estimated from the ratio of integrated spectral areas of the β-phase, A_β, and the mixed-phase, A_{mixed}, (where $A_{mixed} = A_{glassy} + A_\beta$) absorption spectra, taking into account that the relative difference in oscillator strength, f_{osc}, used time-dependent density functional theory (DFT) to estimate $f_{osc}^{\beta} = 1.08 \times f_{osc}^{glassy}$. Consequently, the β-phase fractions in PFO films were calculated by Equation (1):

$$\beta \text{ phase fraction} = \frac{A_\beta}{A_{mixed}} = \frac{A_\beta}{A_\beta + \left((A_{mixed} - A_\beta) \times 1.08\right)} \quad (1)$$

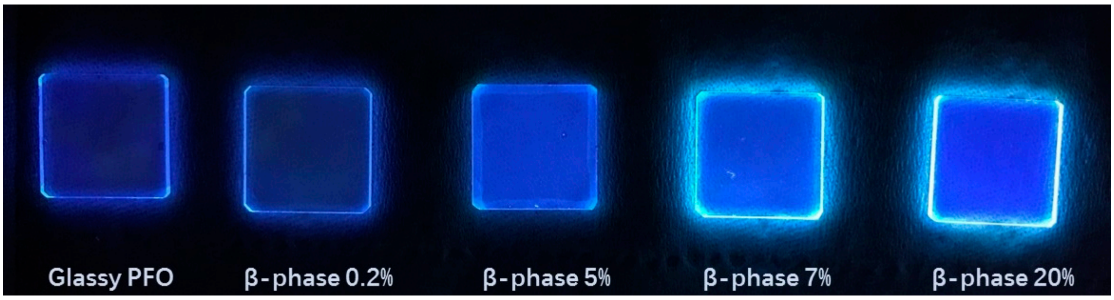

Figure S1. Images of glassy PFO films and PFO film with various β-phase fractions when exposed under 365 nm flashlight.

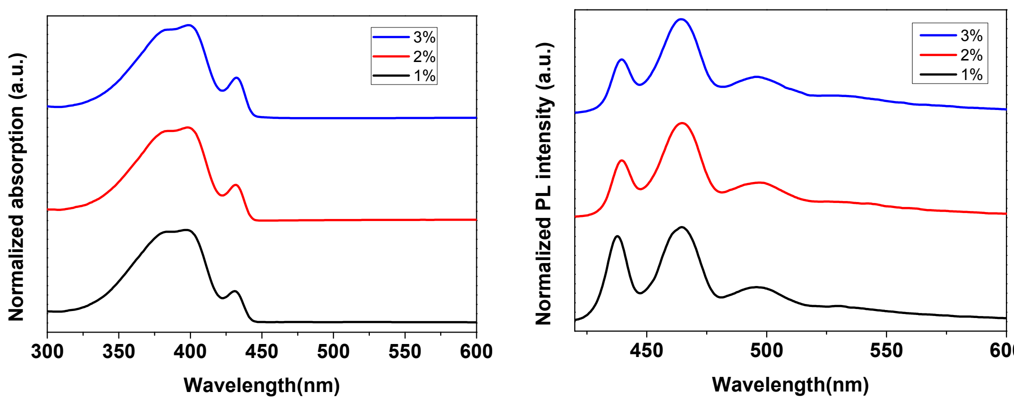

Figure S2. Normalized absorption and PL of the films spin-coated from mixed PFO solution with 1, 2 and 3 vol % paraffin oil.

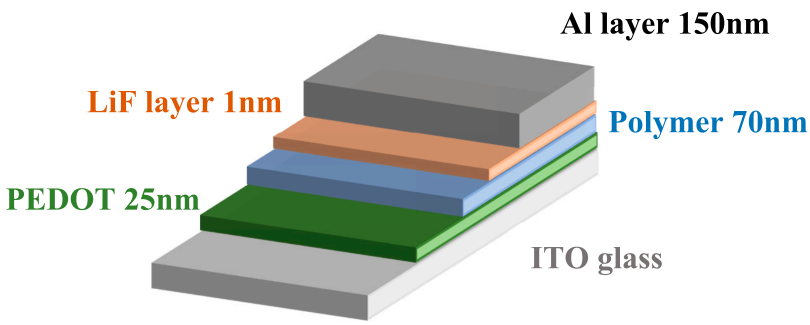

Figure S3. OLED device structure.

Table S1. Values of the PLQE (Photoluminescence quantum efficiency) and β-phase fraction of PFO film samples made from different solution with paraffin oil volume percentages.

Paraffin Oil Volume Percentage (vol%)	β-Phase Fraction (%)	PLQE (%)
0	0	49
0.05	0.2	51
0.07	0.5	53
0.09	1.5	52
0.11	2	55
0.13	4	61
0.15	5	66
0.30	7	51
0.50	20	50