Supporting Information

Fabrication of solution-processable OFET memory using a nano-floating gate based on phthalocyanine-cored star-shaped polymer

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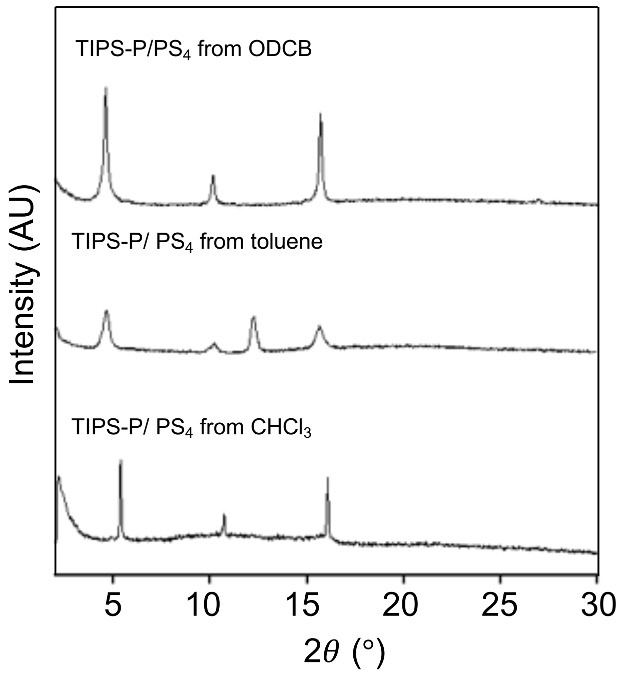

Figure S1. XRD profiles of TIPS-pentacene/PS_4 blend films coated from various solvents.

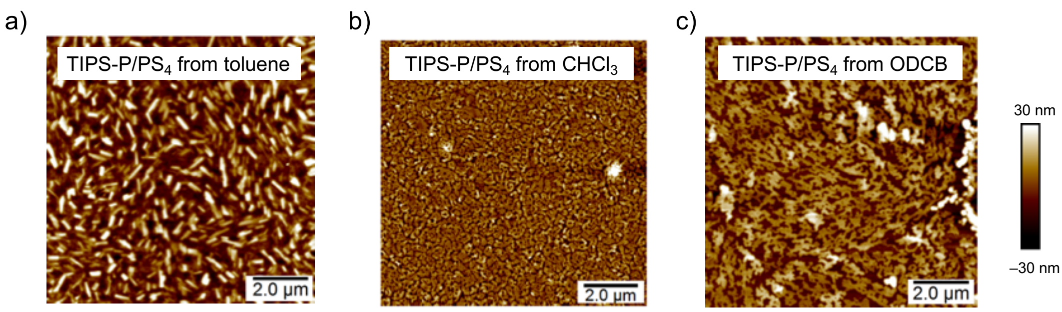

Figure S2. AFM height images of TIPS-pentacene/PS_4 blend films coated from various solvents.

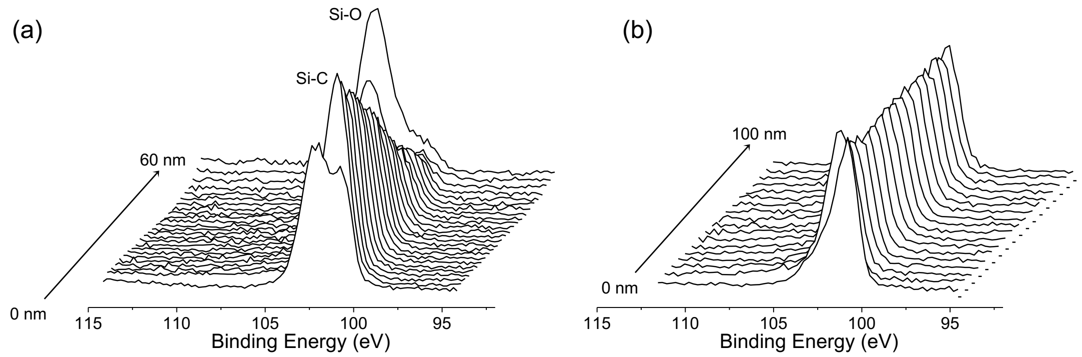

Figure S3. XPS spectral changes of the peak of Si 2*p* during depth profiles on TIPS-pentacene/CuSP blend films spin-coated from ODCB (a) and $CHCl_3$ (b) solutions.

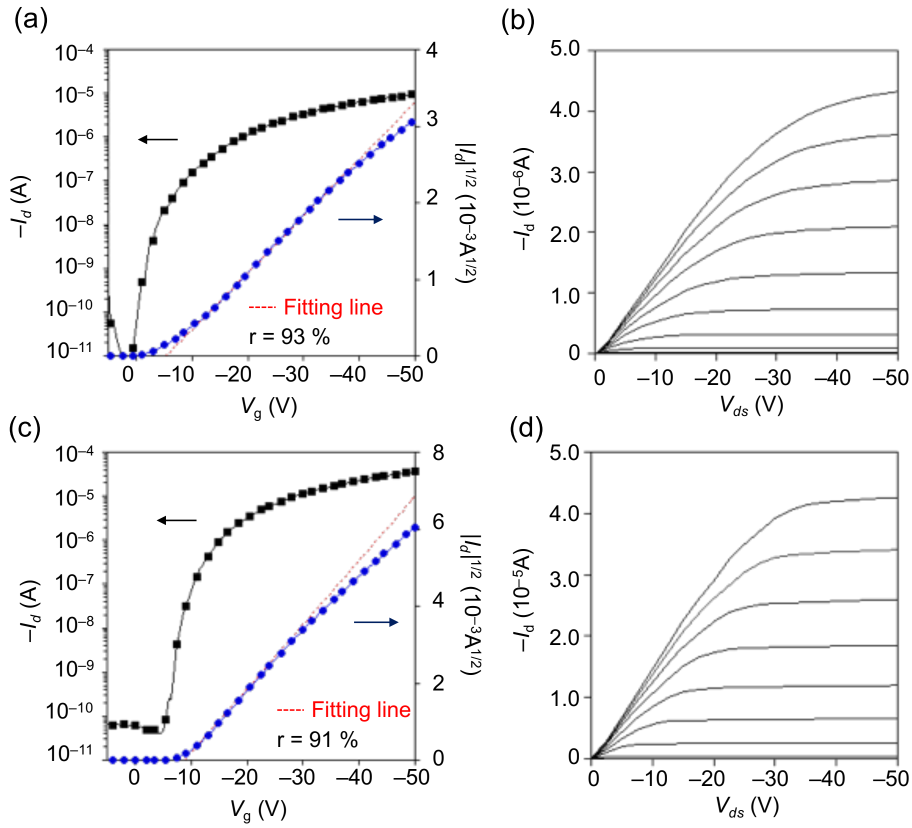

Figure S4. Typical transfer characteristics and output characteristics for OFET devices with the blend films of TIPS-pentacene/CuSP (a, b) and TIPS-pentacene/PS_4 (c, d) spin-coated from ODCB solutions.

In order to evaluate the validity of the effective saturation mobility (μ_{eff}) considering the nonlinearity of the transfer characteristics of OFET, the reliability factor (r) for the effective mobility was calculated using the following equation (1):

$$r = \left(\frac{\sqrt{|I_{\mathrm{D}}|_{V_{max}}} - \sqrt{|I_{\mathrm{D}}|_{V_{th}}}}{|V_{max} - V_{th}|} \right)^2 \Bigg/ \left(\frac{\partial \sqrt{I_{\mathrm{D}}}}{\partial |\mathrm{G}|} \right)^2_{claimed} \qquad (1)$$

where $V_{\max}$ and V_{th} are the maximum gate voltage and the threshold voltage, respectively, and $|I_{\mathrm{D}}|V_{\mathrm{th}}$ are the source currents and at $V_{\max}$ and V_{th}, respectively.

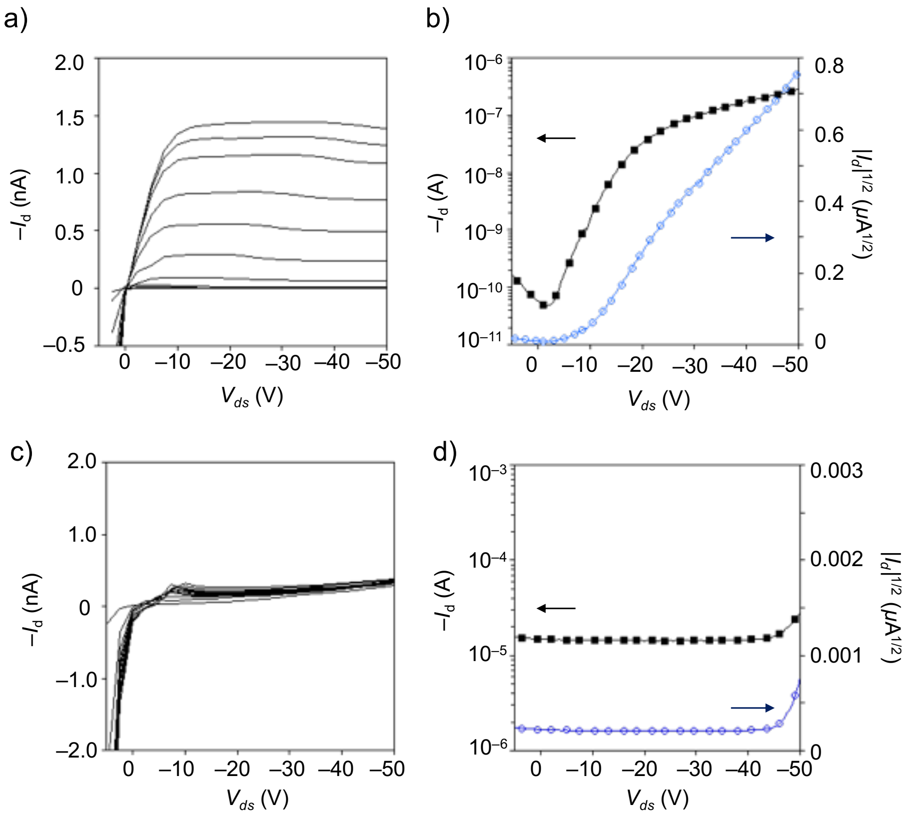

Figure S5. Typical output and transfer characteristics for OFET devices with the blend films of TIPS-pentacene/CuSP coated from toluene (a, b) and $CHCl_3$ (c, d) solutions.

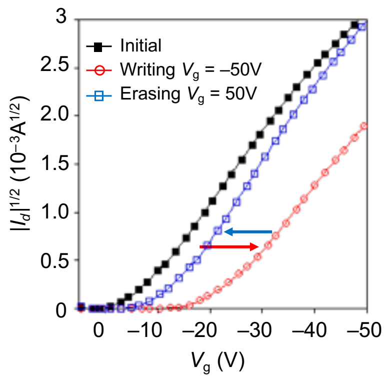

Figure S6. The linear plots of square root of drain-to-source current vs gate bias of OFET device with the blend film of TIPS-pentacene/CuSP spin-coated from ODCB solutions.

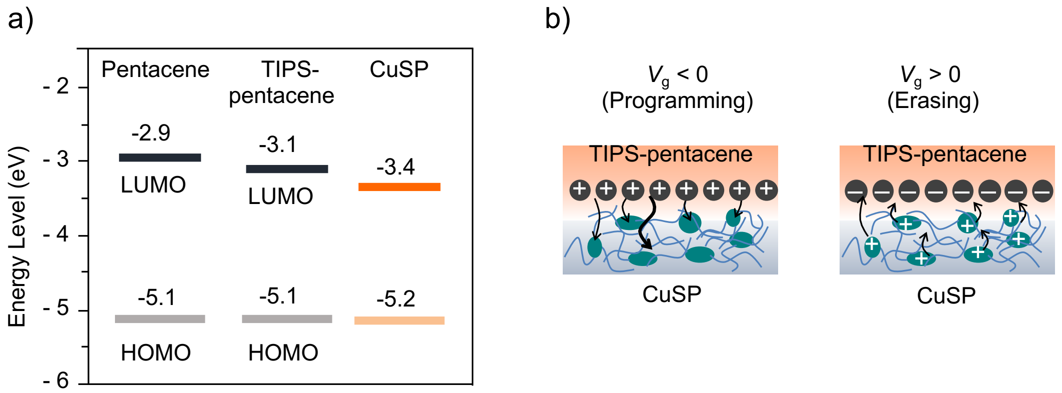

Figure S7. (a) Energy levels diagrams of organic semiconductors and CuSP. (b) Proposed mechanism of the memory devices with a phase-separated TIPS-pentacene/CuSP blend layer.