

Supplementary Information (SI) for Journal of Materials Chemistry C.
This journal is © The Royal Society of Chemistry 2025

Crystallographic Orientation-dependent Anisotropic Doping in Organic Single-Crystal Microplates

Mingming Su^a, Zheng Ren^b, Tingyi Yan^b, Yuxin Cheng^c, Ruofei Jia^b, Guangpeng Zhu^a, Jinwen Wang^{*b}, Xiujuan Zhang^{*b}, Jiansheng Jie^{*a,b}

^aMacao Institute of Materials Science and Engineering, MUST-SUDA Joint Research Center for Advanced Functional Materials, Macau University of Science and Technology, Taipa, 999078 P. R. China

^bState Key Laboratory of Bioinspired Interfacial Materials Science, Institute of Functional Nano & Soft Materials (FUNSOM), Soochow University, Suzhou 215123, China

^cCollege of Chemistry, Chemical Engineering and Materials Science, Soochow University, Suzhou 215123, China

*Corresponding Authors: Jinwen Wang (jwwang1991@suda.edu.cn); Xiujuan Zhang (xjzhang@suda.edu.cn); Jiansheng Jie (jsjie@suda.edu.cn)

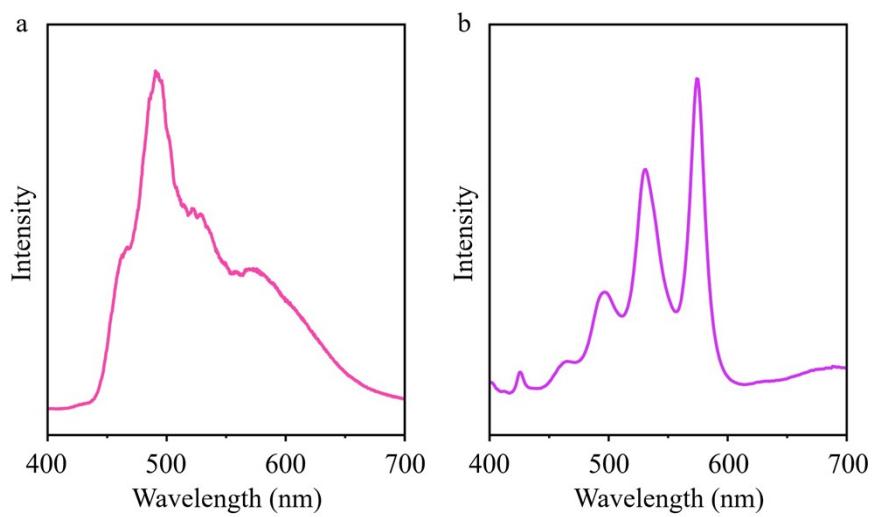


Fig. S1 (a) The fluorescence spectrum of p-MSB single crystals. (b) The absorption spectrum of Pen molecules.

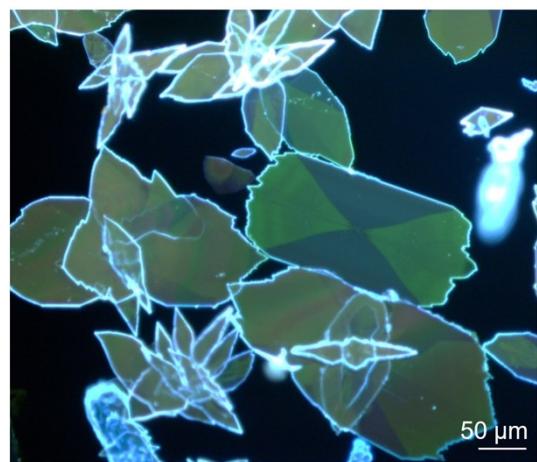


Fig. S2 The emission patterns of OSSCs obtained from the solution with the mass ratios of 5:1 at room temperature.

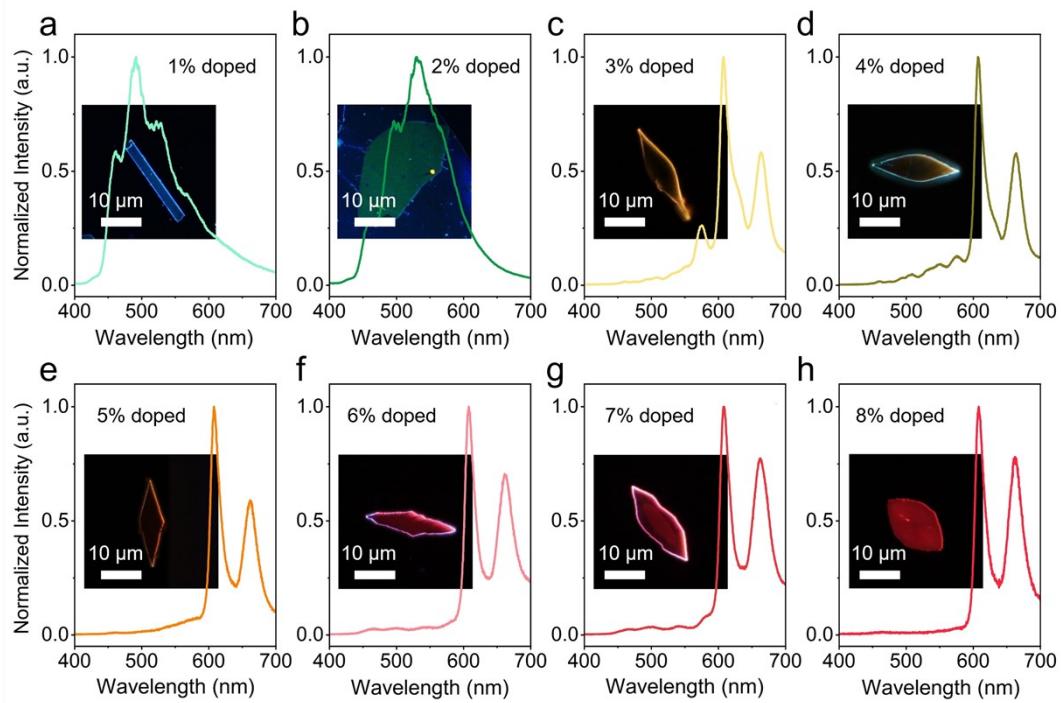


Fig. S3 Pentacene doped p-MSB single crystals with controlled pentacene doping concentration via physical vapor deposition. PL spectra of pentacene-doped p-MSB crystals with different doping concentration. Illustration: Top-view photographs under UV-light irradiation of crystals with a doping concentration of 1% to 8%.

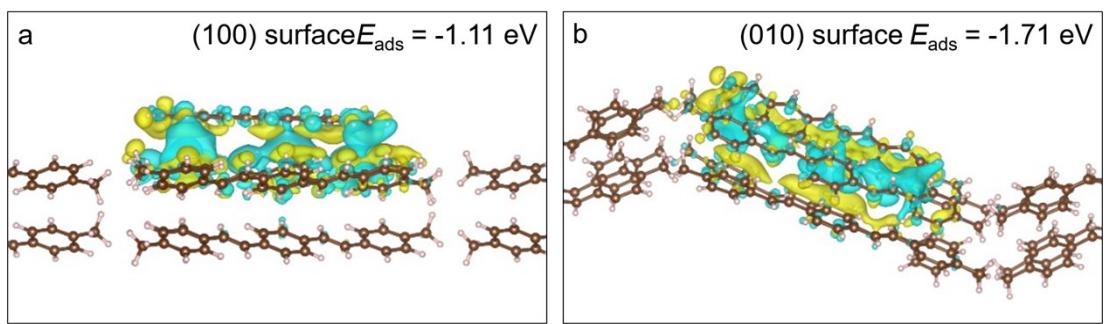


Fig. S4 The calculated adsorption energy of pentacene on (a) (100) and (b) (010) crystal surface of p-MSB.

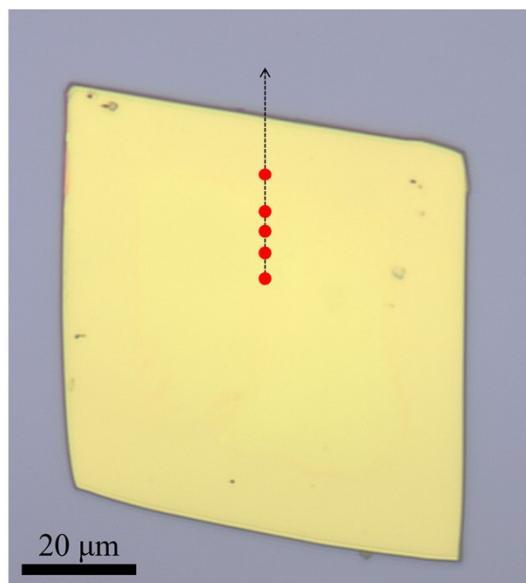


Fig. S5 Optical image of Pen-doped p-MSB single crystals obtained at growth temperature of 20 °C (1:1 mass ratio), the black arrows indicate the test direction of the optical waveguide, and the red dots indicate the measurement points.

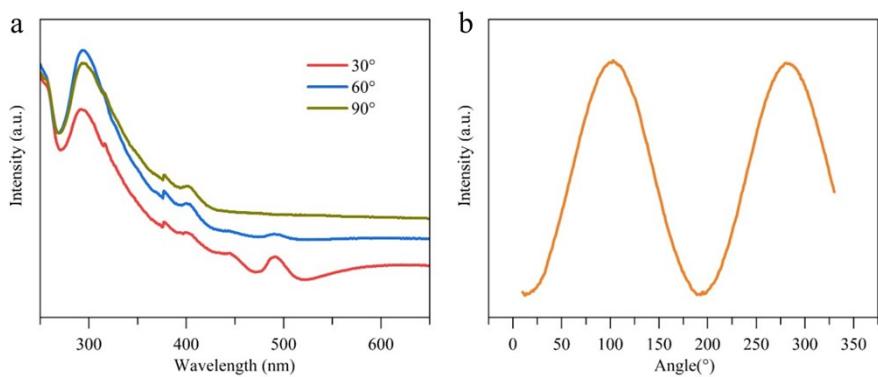


Fig. S6 Polarization absorption of Pen-doped p-MSB single crystals. (a) Polarization absorption spectra of Pen-doped p-MSB single crystals at 30°, 60° and 90°. (b) Absorption spectra of Pen-doped p-MSB single crystals at different polarization angles.

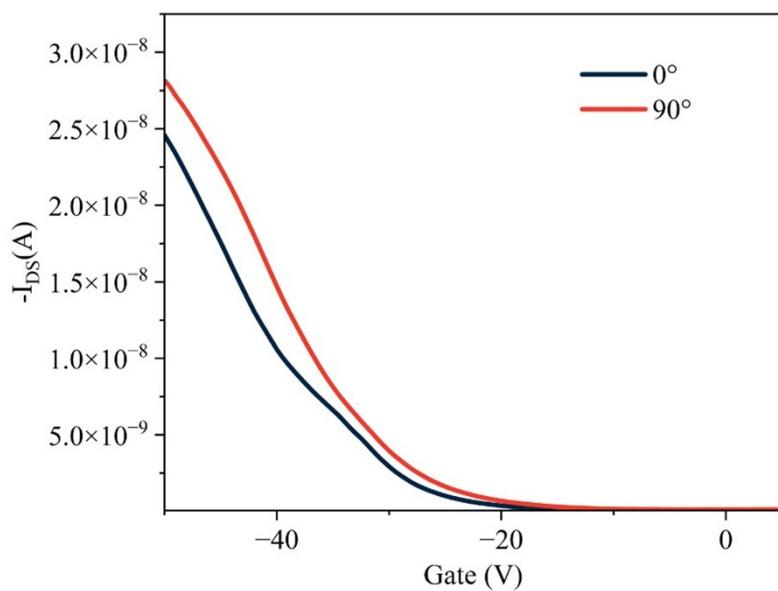


Fig. S7 The polarization electrical performance of Pen-doped p-MSB single crystals.

Table S1. The incident optical power density and the corresponding numbers of paper layers.

Layers of filter paper	Layers of weighing paper	Optical power density (mW/cm ²)
3	12	0.002
2	12	0.004
1	12	0.013
0	12	0.059
0	9	0.133
0	6	0.322
0	3	0.78