

Electronic Supplementary Information (ESI)

Trapped-assisted ultrasensitive near-infrared organic photomultiple photodetectors based on Y-type titanylphthalocyanine nanoparticles

Xiaolong Li,^{a,b} Shirong Wang,^{a,b} Yin Xiao^{a,b} and Xianggao Li^{*a,b}

^a. School of Chemical Engineering and Technology, Tianjin University, Tianjin 300072, China. *E-mail*: lixianggao@tju.edu.cn.

^b. Collaborative Innovation Center of Chemical Science and Engineering (Tianjin), Tianjin 300072, China.

1. The Morphology of Y-TiOPc MPs

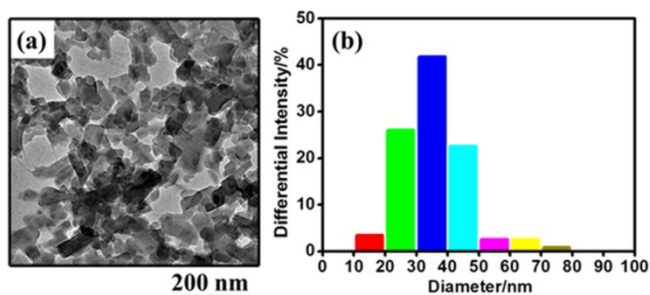


Fig. S1 (a) TEM picture of the Y-TiOPc MPs embedded in PVB film with an average diameter of 35.6 ± 10.6 nm; (b) Size distribution of the Y-TiOPc MPs embedded in PVB film.

2. Photoelectric Performance of the OPD with Y-TiOPc MPs

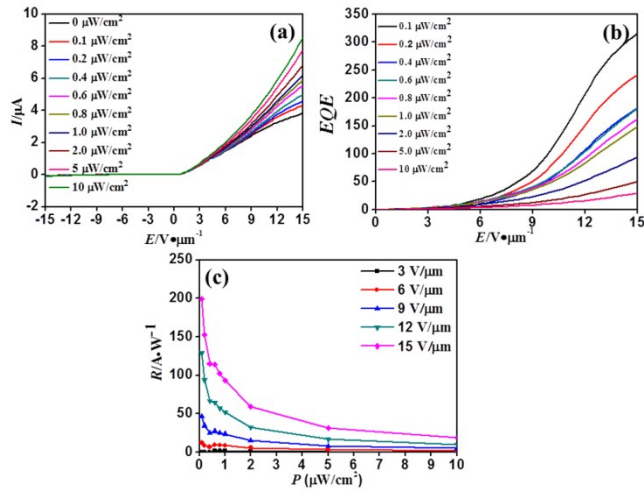


Figure. S2 (a) I - E curves of Y-TiOPc MPs as photoactive material in the dark and under different light irradiances ($\lambda = 780 \text{ nm}$). (b) EQE (b) and R (c) as a function of illumination intensity under different electric field.

3. The internal photogeneration charge efficiency (η_{e-h}) of OPDs

Table S1. η_{e-h} of OPDs based on Y-TiOPc NPs and Y-TiOPc MPs under different illumination intensities and electric field intensities.

	P ($\mu\text{W}/\text{cm}^2$)	0.1	0.2	0.4	0.6	0.8	1.0	2.0	5.0	10.0
9 $\text{V}/\mu\text{m}$	Y-TiOPc NPs	0.91	0.89	0.60	0.45	0.38	0.32	0.18	0.07	0.03
	Y-TiOPc MPs	0.60	0.58	0.52	0.44	0.36	0.29	0.15	0.06	0.02
15 $\text{V}/\mu\text{m}$	Y-TiOPc NPs	0.97	0.92	0.83	0.72	0.62	0.52	0.30	0.13	0.07
	Y-TiOPc MPs	0.85	0.81	0.74	0.62	0.53	0.46	0.27	0.11	0.06