Supplementary Information

Large-scale and facile synthesis of TiO_2 hollow nanocubes for self-powered ultraviolet photodetector enabling optical communication and imaging

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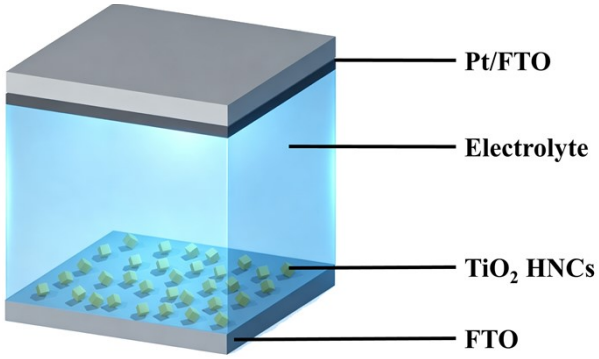

Fig. S1 The schematic of the structure of the TiO_2 HNCs UVPD.

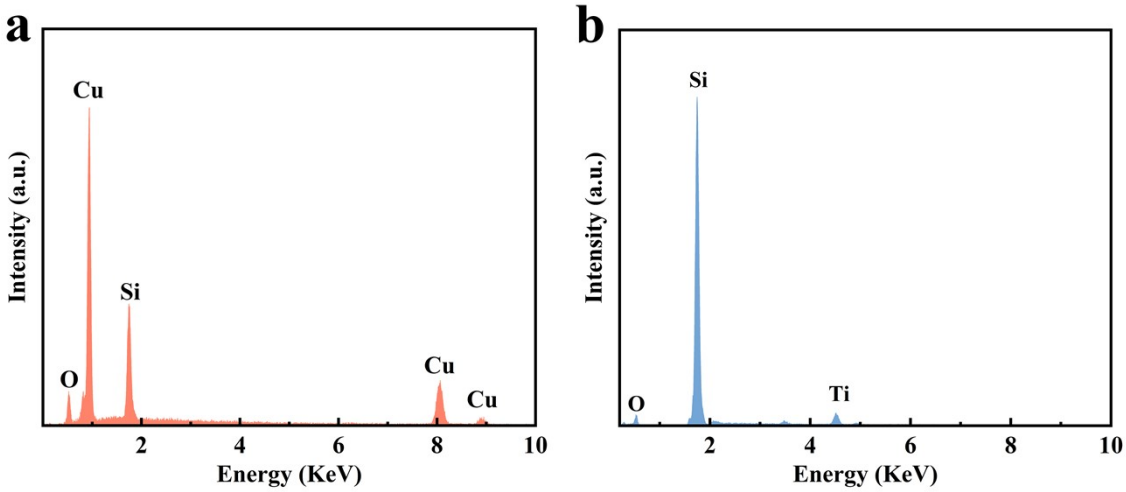

Fig. S2 EDS spectra of Cu_2O NCs (a) and TiO_2 HNCs (b).

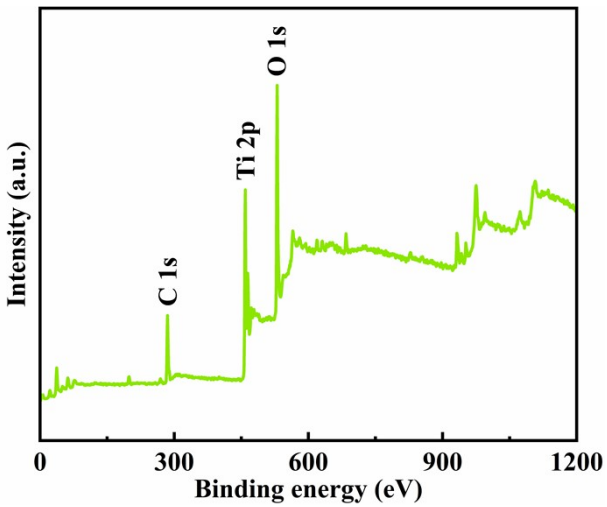

Fig. S3 XPS survey scan of TiO_2 HNCs.

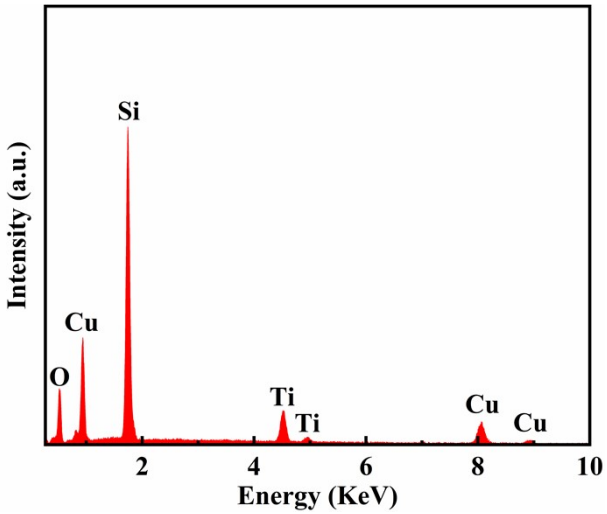

Fig. S4 EDS spectrum of the sample obtained at 2 h LPD reaction.

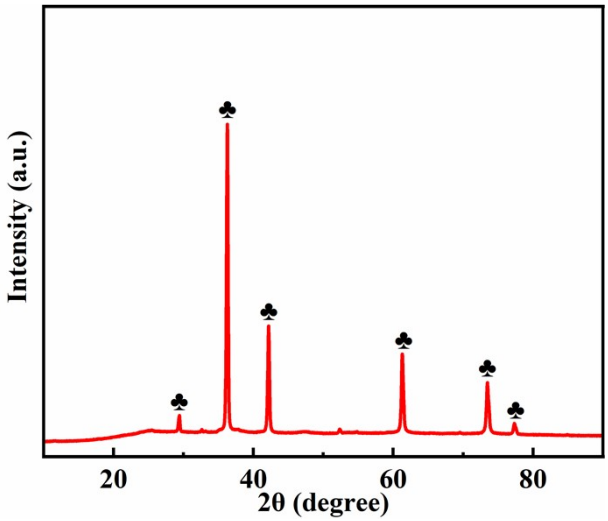

Fig. S5 XRD pattern of the sample obtained at 2 h LPD reaction.

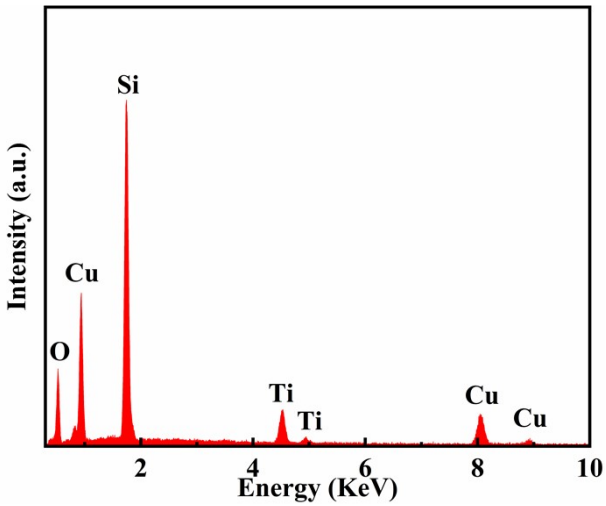

Fig. S6 EDS spectrum of the annealed sample.

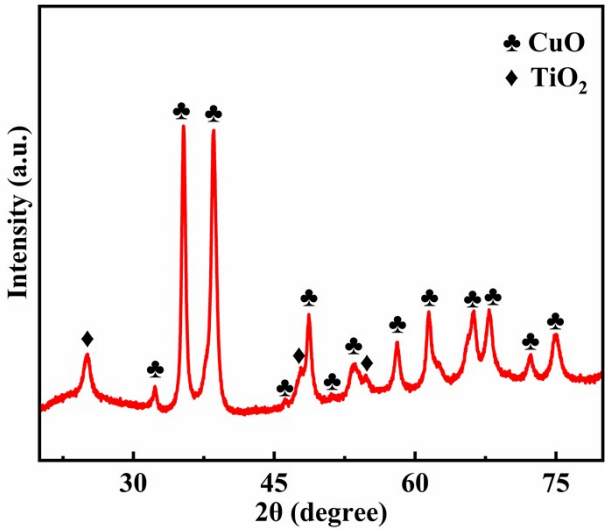

Fig. S7 XRD pattern of the annealed sample.

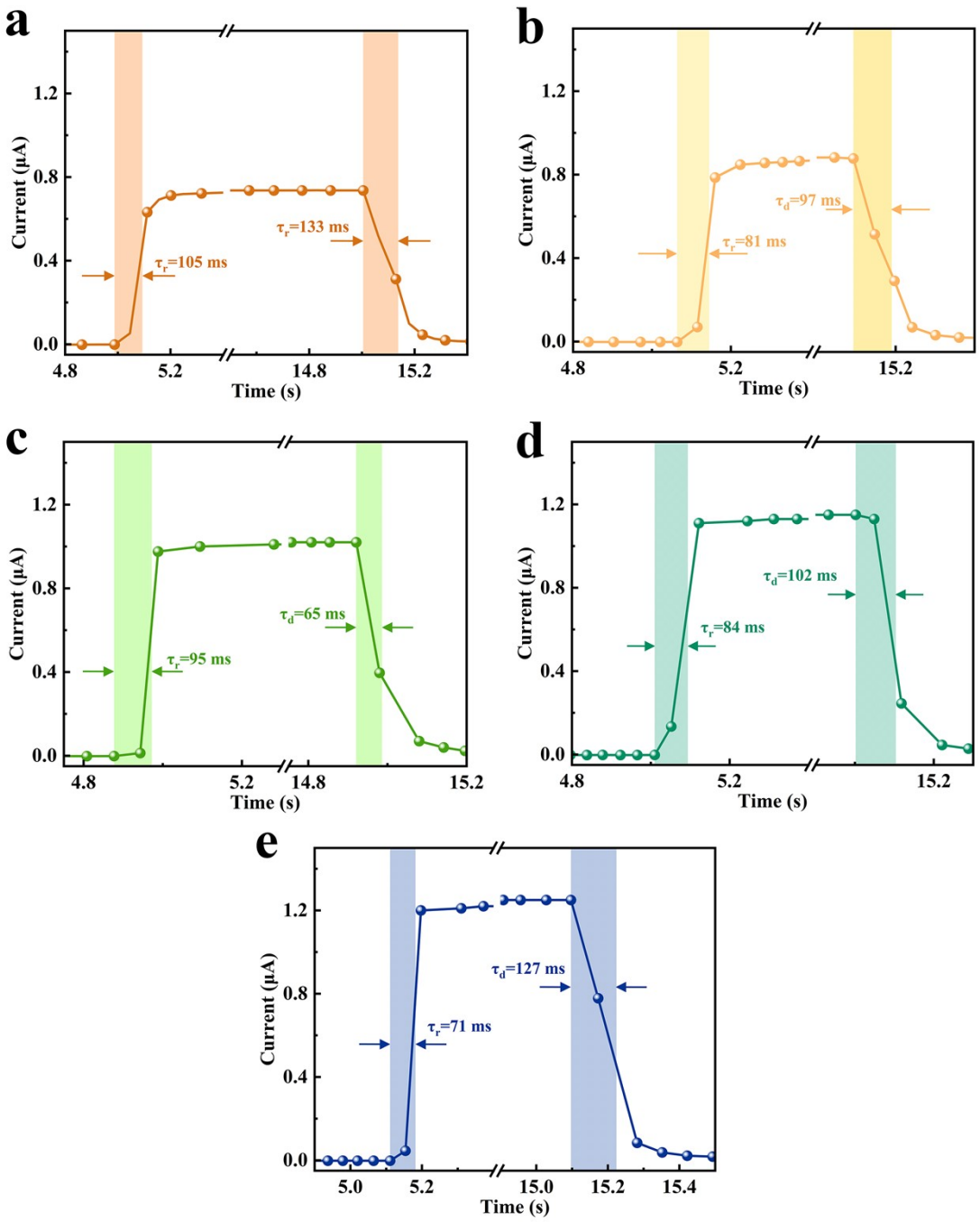

Fig. S8 The magnified single switching cycle at UV light intensity of 25(a), 30(b), 35(c), 40(d), 45(e) mW cm^{-2}.

Table S1 Performance comparison between TiO_2 HNCs UVPD and other TiO_2-Based UVPDs

Materials	Bias	Rise/decay time	Responsivity	Detectivity	Ref.
TiO_2/PC71BM film	0 V	0.06 s/1 μs	33 mA W^{-1}	1.2×10^{14} Jones	[1]
polarized $BaTiO_3$@TiO_2 nanofibers	2 V	0.5 s/~	3.8 mA/W	1.28×10^{11} Jones	[2]
TiO_2/$CuMnO_2$ thin film	0 V	7.3/0.4 s	~	~	[3]
TiO_2 nanowire	5 V	~	0.069 mA W^{-1}	~	[4]
p-CuZnS/n-TiO_2 nanotube	0 V	0.45/0.41 s	8.76 μA/W	~	[5]
TiO_2 nanoparticles	0 V	0.064/0.106 s	4.5 mA W^{-1}	3.38×10^{11} Jones	[6]
Au/TiO_2 nanotube/P3HT	0 V	0.48/2.21 s	0.25 mA W^{-1}	2.9×10^{10} Jones	[7]
polarized $BaTiO_3$@TiO_2 nanofibers	1	0.5 s/~	0.0256 mA W^{-1}	2.75×10^{7} Jones	[8]
TiO_2/Ag film	0	0.002/0.057	0.133	~	[9]
TiO_2/NiO nanowells	0	1.2/7.1	0.042	1.1×10^{9}	[10]
TiO_2 HNCs	0 V	0.105/0.133 s	0.104mA W^{-1}	9.66×10^{10} Jones	**This work**

References

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