Supporting Information

Multiporous Terbium Phosphonate Coordination Polymer Microspheres as Fluorescent Probe for Trace Anthrax Biomarker Detection

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Material characterization

The structure and morphology of multiporous terbium phosphonate coordination polymers microspheres (TbP-CPs) were characterized by ultrahigh resolution field emission scanning electron microscopy (UHRFESEM, NOVA Nano SEM450, FEI, USA) and ultrahigh resolution transmission electron microscope (HR-TEM, JEM-2100, JEOL, Japan). The X-ray photoelectron spectra were obtained using an ESCALAB 250Xi X-ray photoelectron spectrometer (XPS, USA). The specific surface area of TbP-CPs was calculated by the Brunauer-Emmett-Teller (BET) method. Nitrogen sorption/desorption isotherm was performed on a Micromeritics Instrument Corporation TriStar II 3020 (USA) at 77 K. Before the sorption/desorption measurement, the TbP-CPs were degassed in a vacuum at 300 °C for 10 h. The pore size distribution (PSD) was calculated based on the adsorption branch with the Barrett-Joyner-Halenda (BJH) model. The FTIR spectrum of TbP-CPs was characterized (Nicolet 6700 FTIR, Thermo, USA) using the KBr pellet method. Thermogravimetric analysis (TGA) was performed in a nitrogen atmosphere at a heating rate of 10 °C min^{-1} from 40 °C to 800 °C (Pyris Diamond, PerkinElmer, USA). Then, the fluorescence spectra for TbP-CPs as fluorescence probe was measured with a Lumina Fluorescence Spectrometer (Thermo Scientific). Finally, the fluorescence lifetime of TbP-CPs was measured with a Fluorescence Spectrofluorometer (FLS980, Edinburgh Instruments, UK).

Table S1 The comparison of different fluorescent probe for DPA detection

Fluorescent probes	Detection limit (nM)	Linear range (μM)	Refs.
Tb/Eu@bio-MOF	34	0.05-1	[1]
SiO_2-Tb-EDTA	10.3	0-12	[2]
CDs-Tb	0.1	0.0005-2.5	[3]
CDs-Cu^{2+} systems	79	0.25-20	[4]
CDs/Eu-NCPs	5.1	0.025-5	[5]
Automated anthrax smoke detector	0.2	0.01-0.1	[6]
Eu-Gd(BDC)1.5$(H_2O)_2$@SiO_2	48	/	[7]
AMP/Tb	10	0.02-20	[8]
LnAg NPs	12.3	0.04-10	[9]
TbP-CPs	5.0	0-8	This work

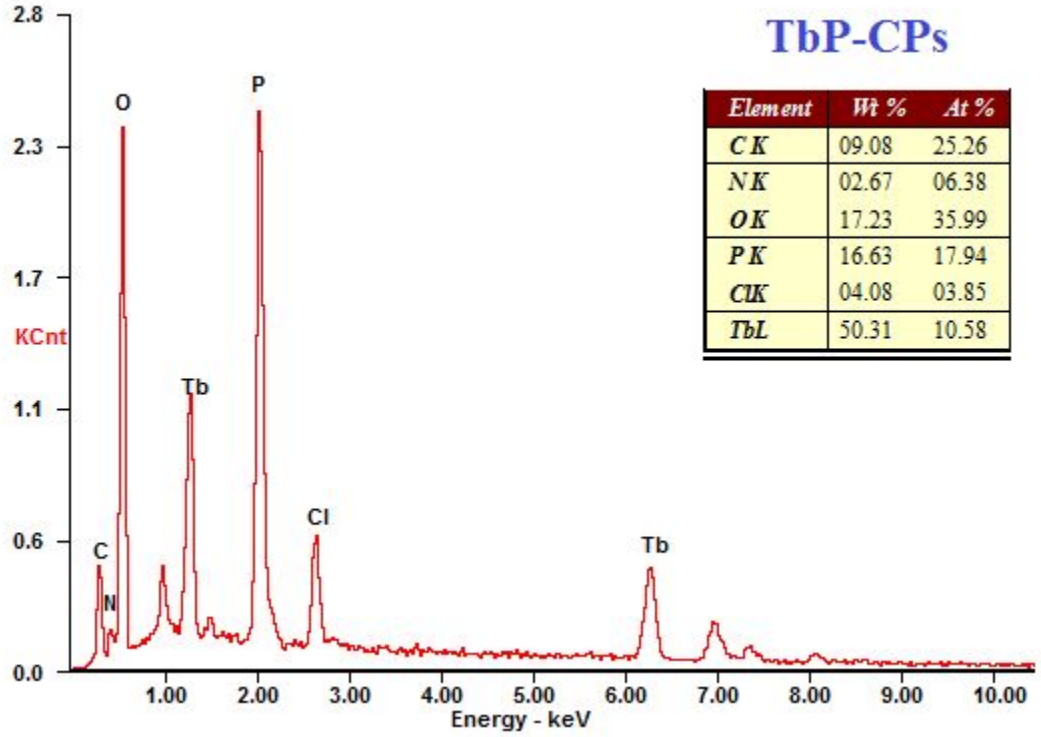

Figure S1. Energy Dispersive Spectrometer (EDS) spectrum of the TbP-CPs

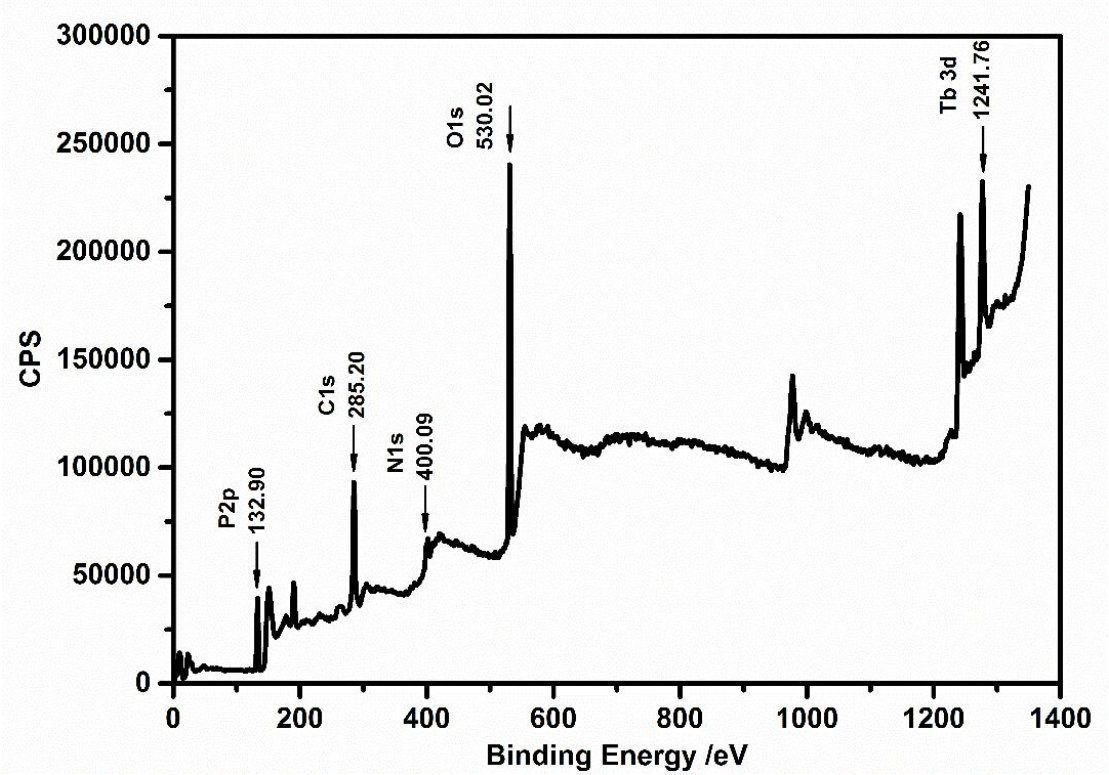

Figure S2. The XPS spectrum of the TbP-CPs

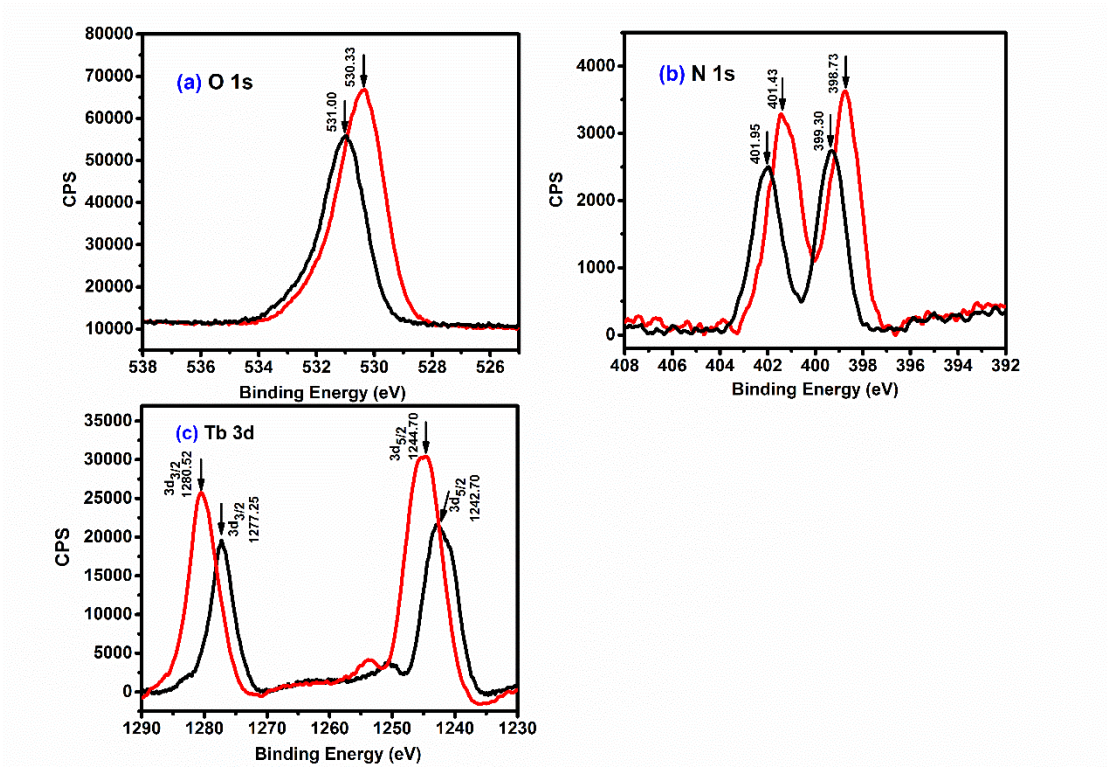

Figure S3. XPS spectra of O element (a), N element (b) and Tb element (c) before (black curve) and after (red curve) the addition of DPA

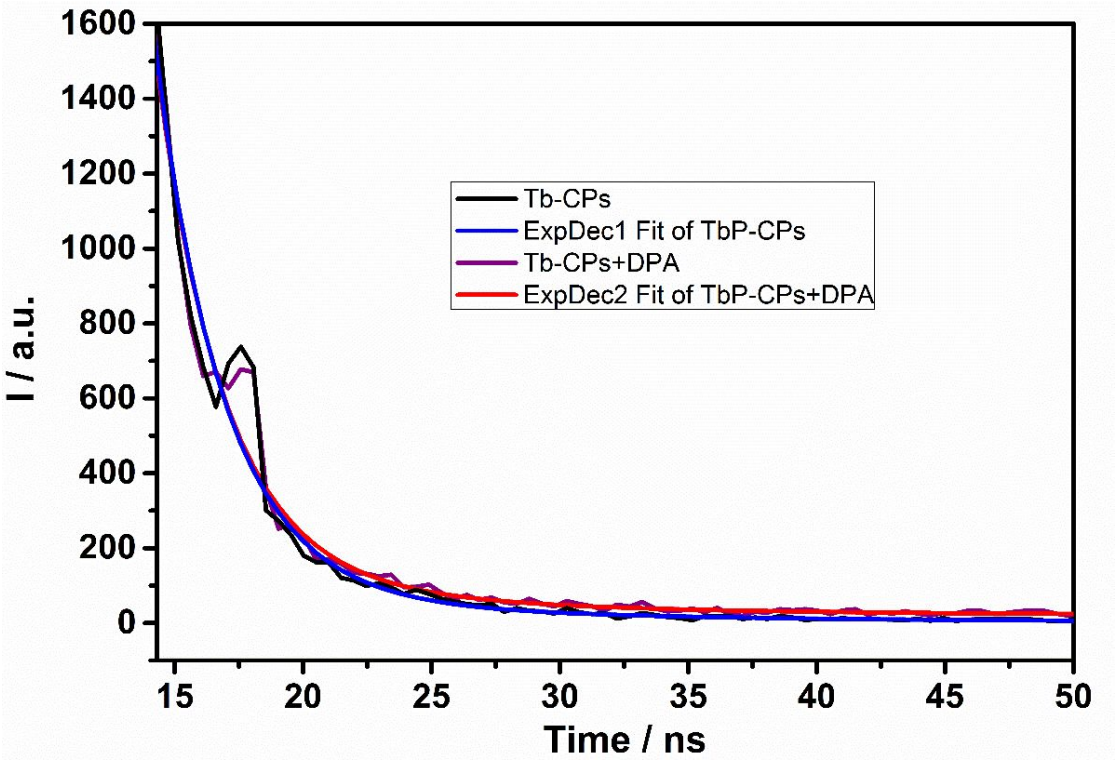

Figure S4. Fluorescent emission decay curves of TbP-CPs and with 5 μM DPA at 544 nm (Decay curve of Tb-CPs , Black curve; Decay fitted curve of Tb-CPs , Blue curve; Decay curve of Tb-CPs+PDA , Purple curve; Decay fitted curve of Tb-CPs+PDA , Red curve)

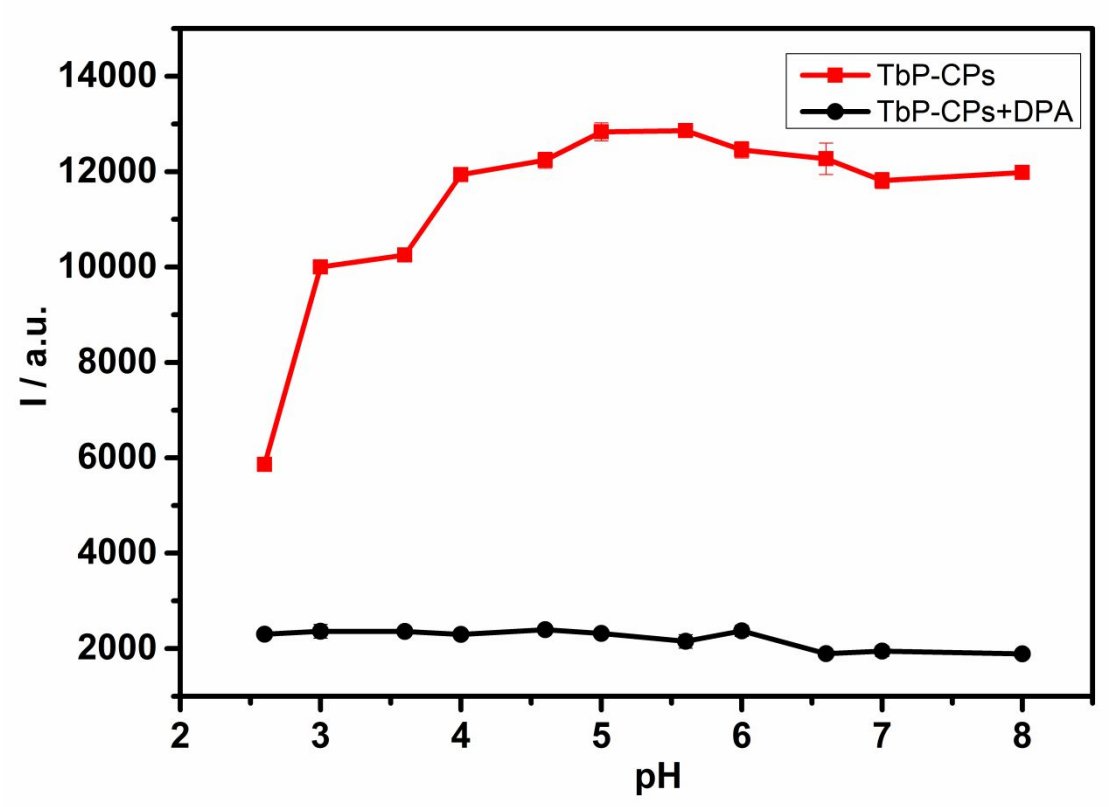

Figure S5. Effects of pH values on fluorescence intensity of TbP-CPs with 2.0 μM DPA (red curve) and without DPA (black curve) in NaAc-HAc buffer (200 mM, pH 5.0)

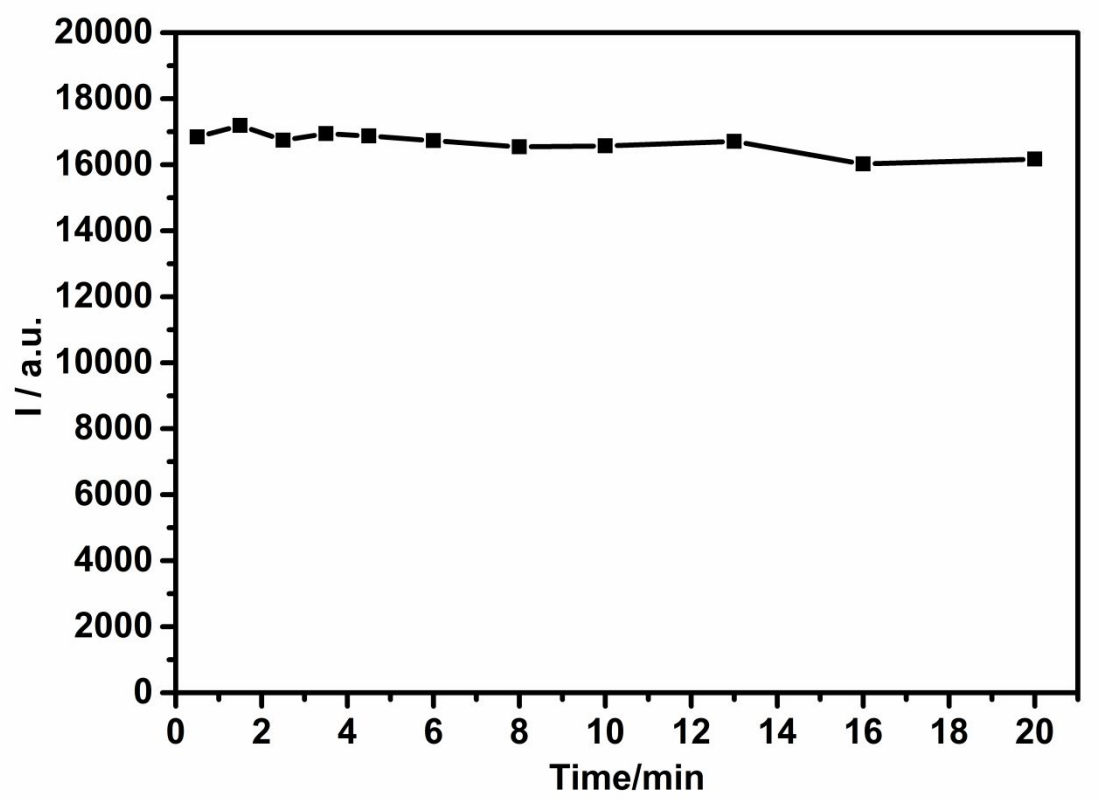

Figure S6. Effects of interaction time on fluorescence intensity of TbP-CPs with 2.0 μM DPA in NaAc-HAc buffer (200 mM, pH 5.0)

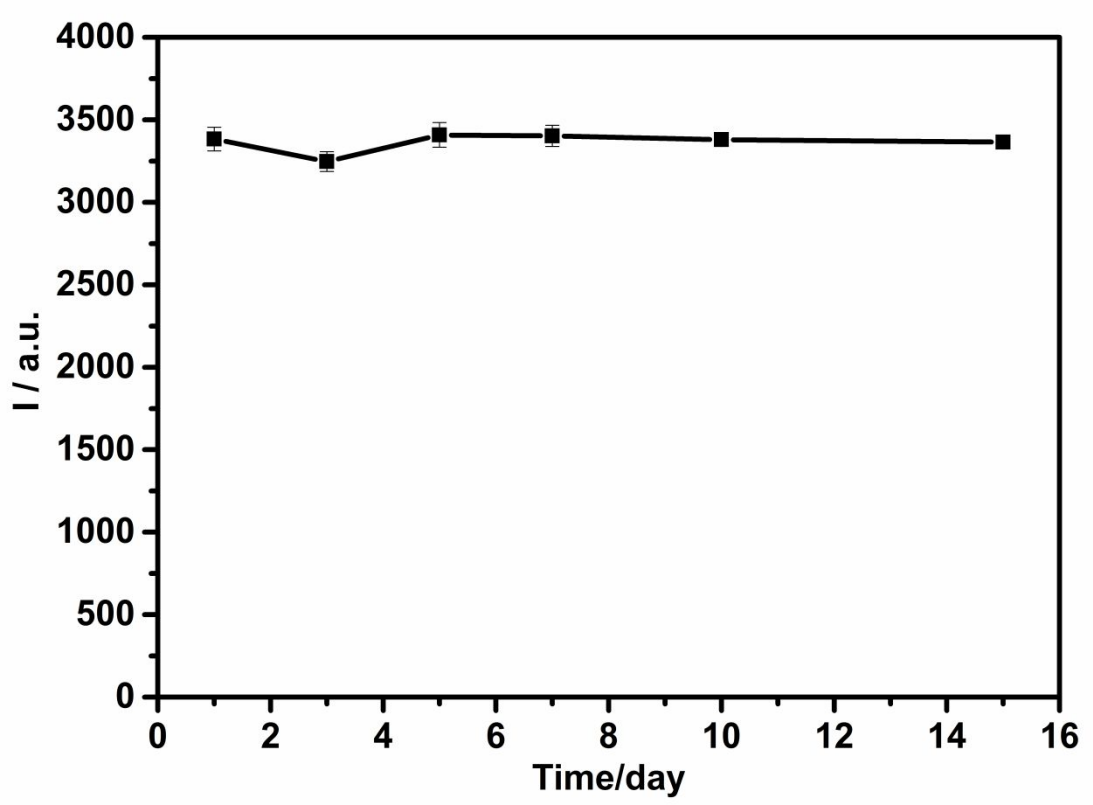

Figure S7. The stability of 0.3 mg/mL TbP-CPs suspension solution in NaAc-HAc buffer (200 mM, pH 5.0)

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