Supporting Information

Surfactant sensitized covalent organic frameworks functionalized lanthanide doped nanocrystals：An ultrasensitive sensing platform for perfluorooctane sulfonate

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1. SEM characterization of UCNPs@COFs

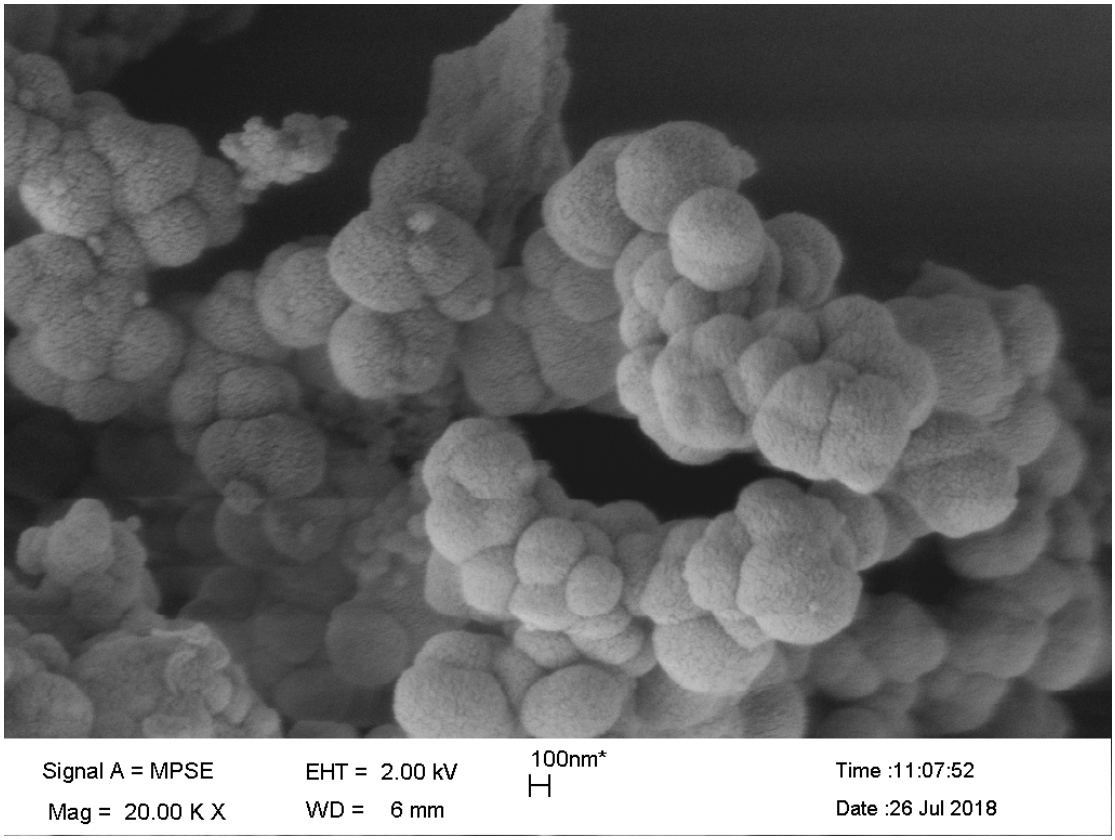


Figure S1. SEM images of UCNPs@COFs.

2. FT-IR characterization of TFB, PDA and UCNPs@COFs

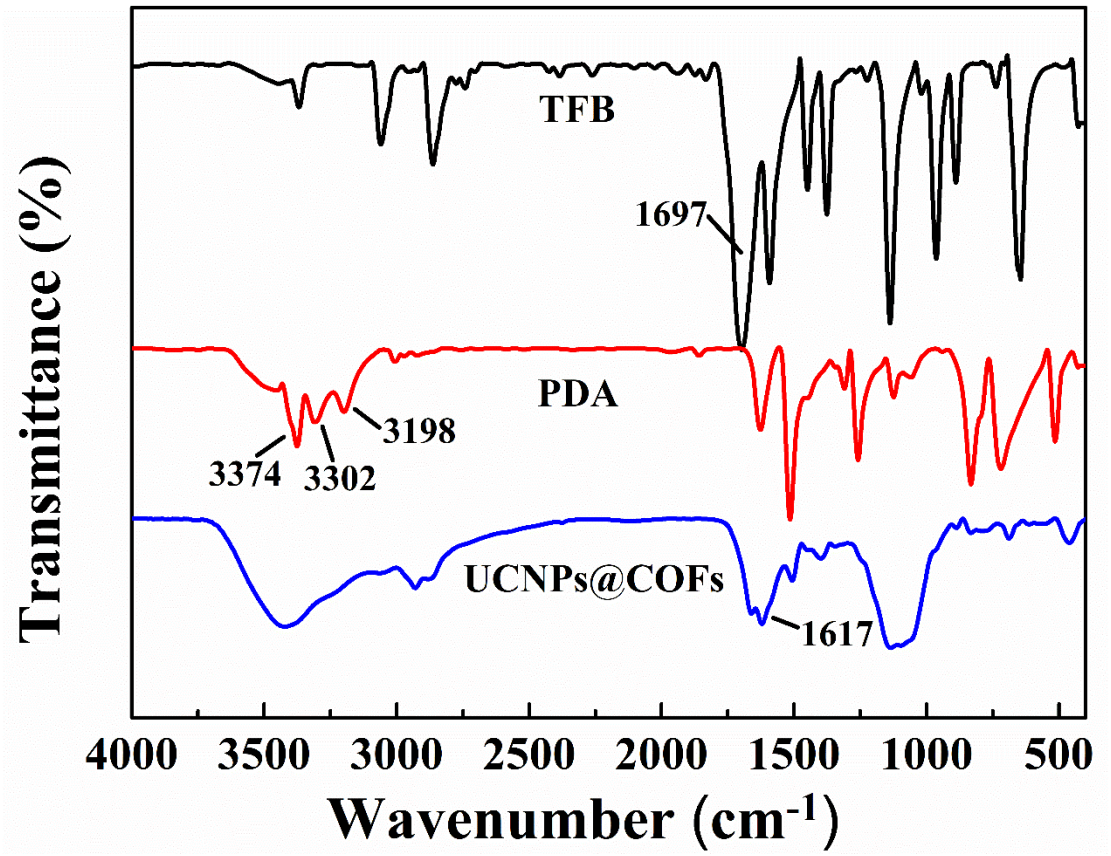


Figure S2. FT-IR spectra of TFB (black), PDA (red) and UCNPs@COFs (blue).

3. Solvent selection of the detection system

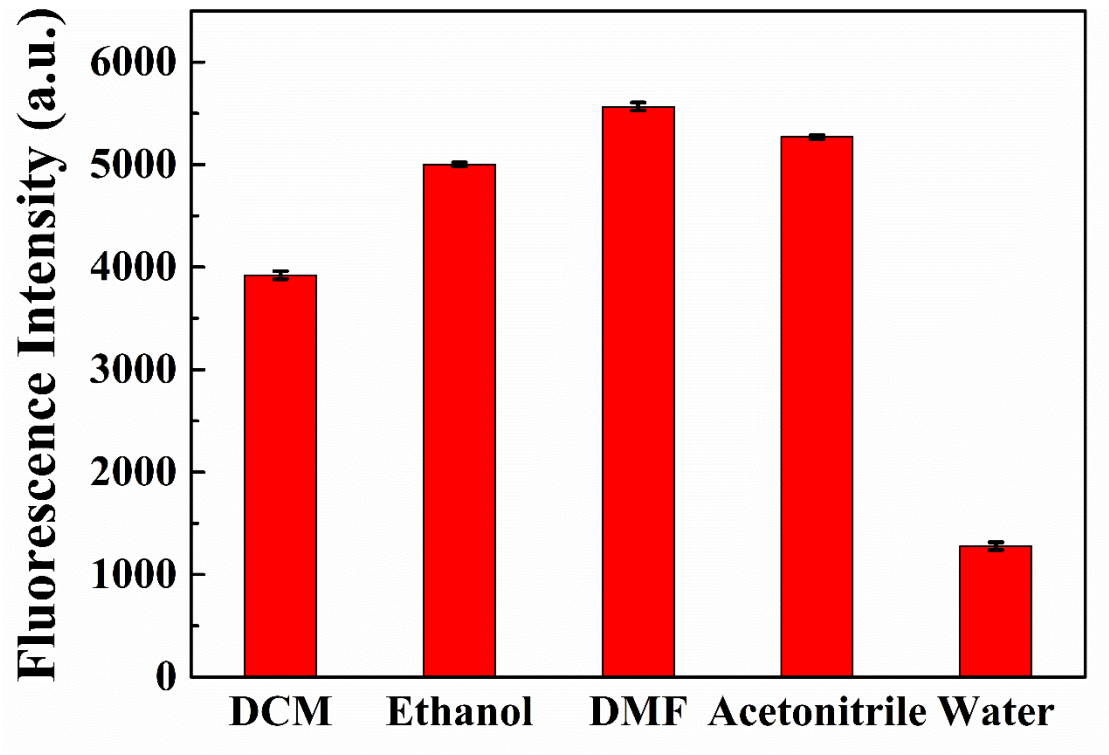


Figure S3. Fluorescence intensities of UCNPs@COFs dispersed in four organic solvents and water.

4. Stability of UCNPs@COFs

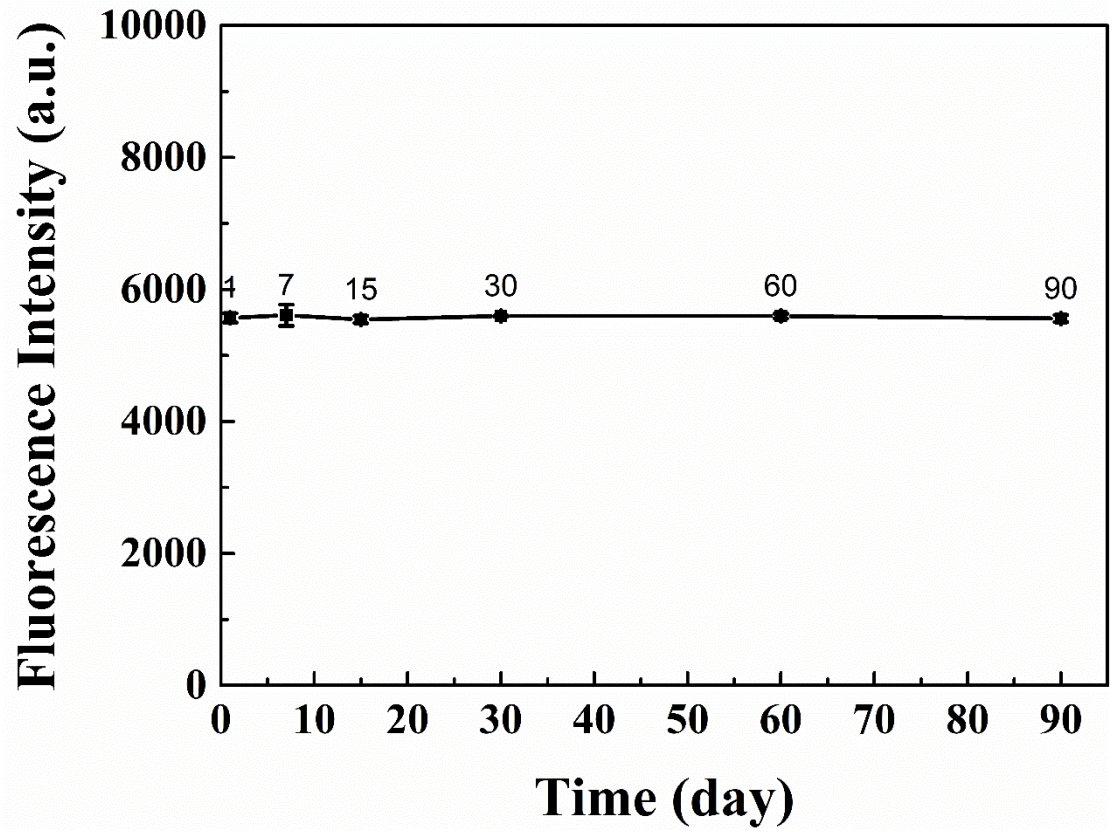


Figure S4. Fluorescence intensities of UCNPs@COFs (dispersed in DMF) during storing.

5. Effect of different surfactants on UCNPs@COFs

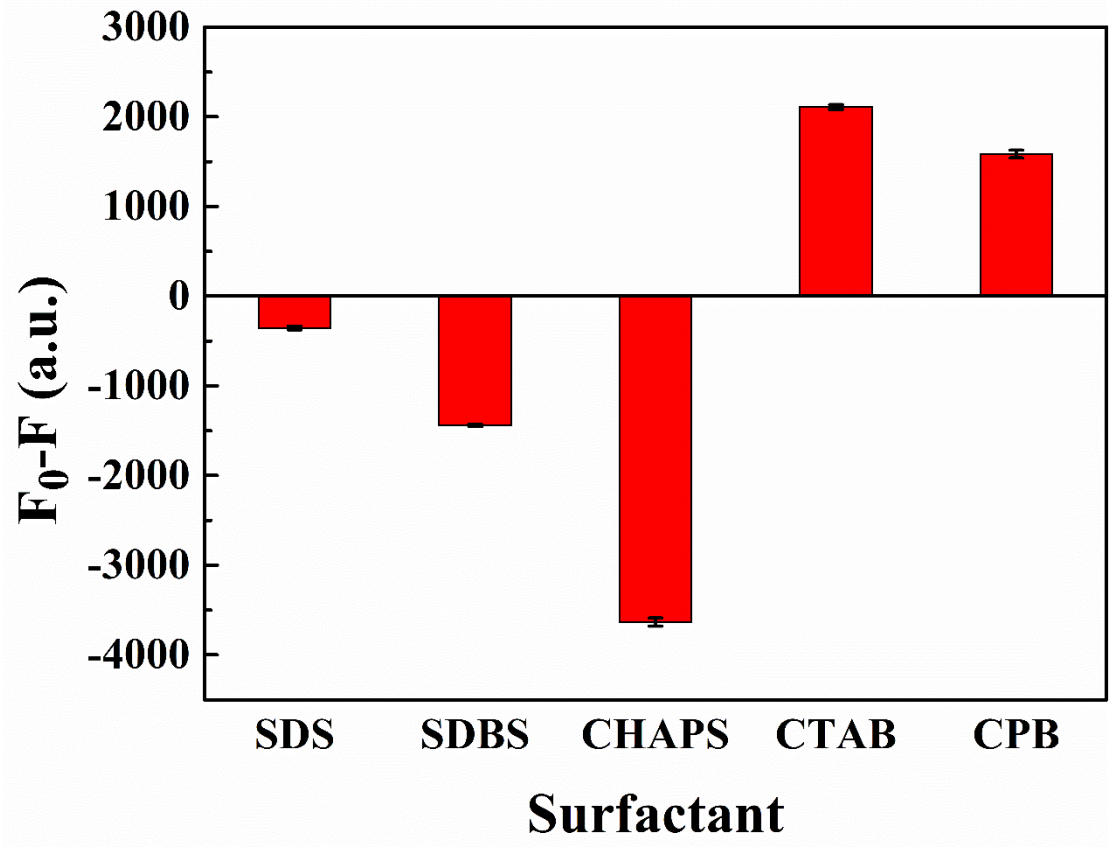


Figure S5. The effect of different surfactants on UCNPs@COFs. (F_0 and F are the fluorescence intensities of UCNPs@COFs at 550 nm in the absence and presence of surfactant, respectively)

6. Contact angles testing

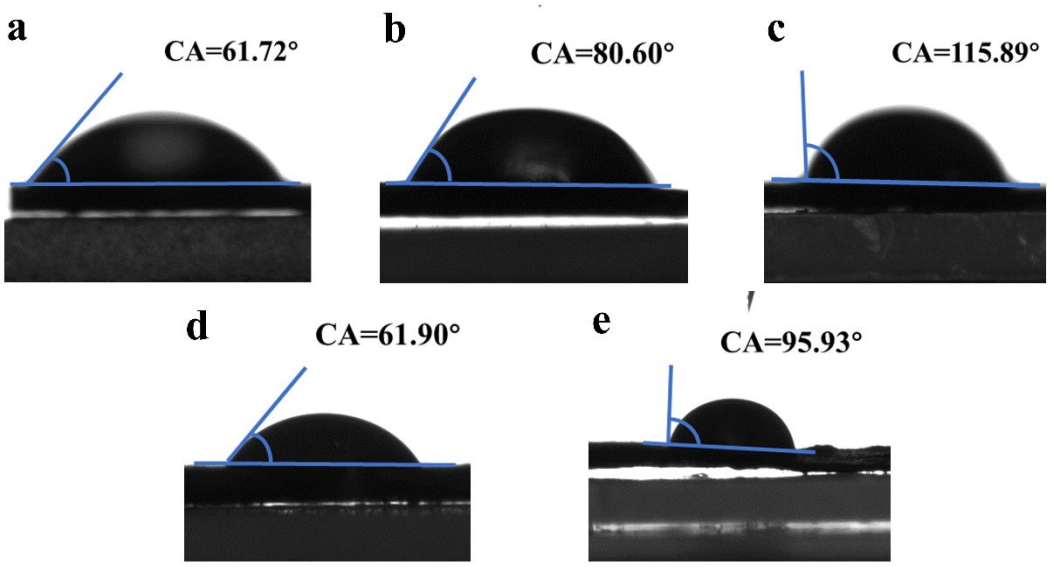


Figure S6. Contact angles of UCNPs@NH_2 (a), UCNPs@COFs (b), UCNPs@COFs & SDBS (c), UCNPs@COFs & CHAPS (d), UCNPs@COFs & CPB (e).

7. Stern-Volmer plots of F_0/F vs lg[PFOS]

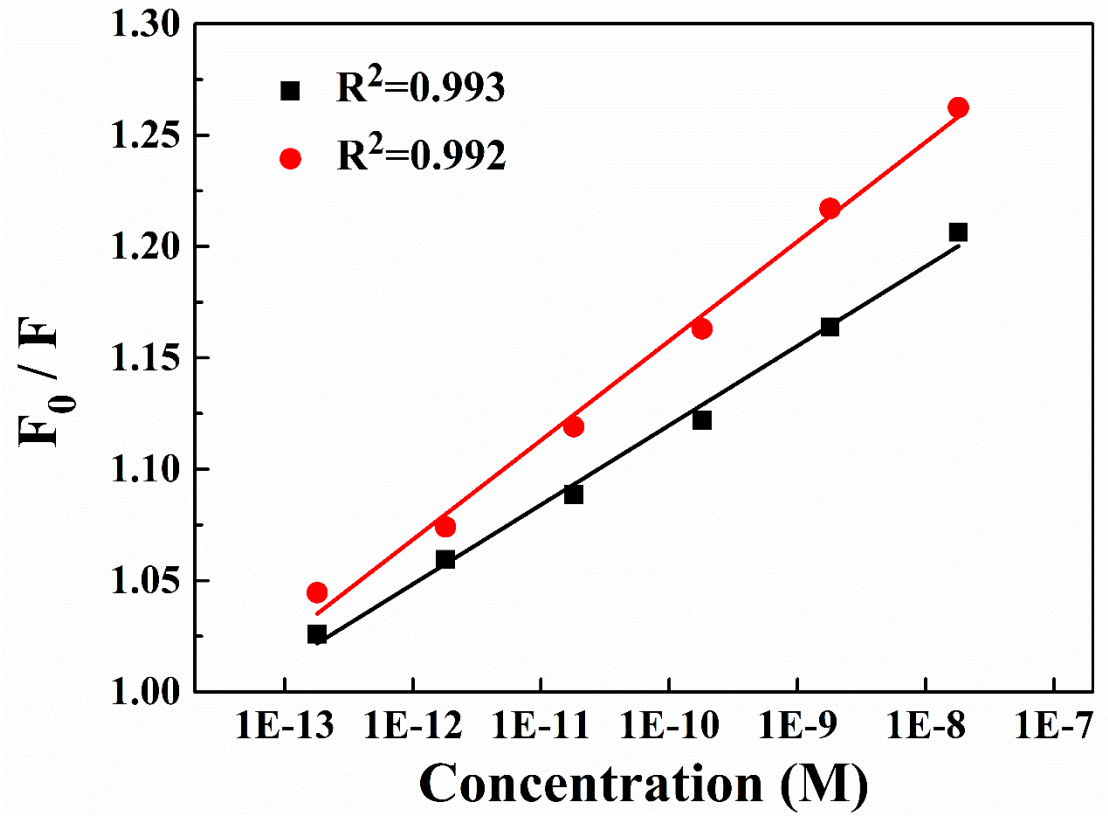


Figure S7. Stern-Volmer plots of F_0/F vs lg[PFOS]. (The fluorescence quenching of UCNPs@COFs to different amounts of PFOS were determined at room temperature (black line) and at 50 ℃ (red line), respectively.)

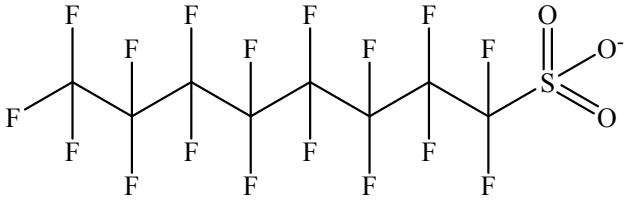
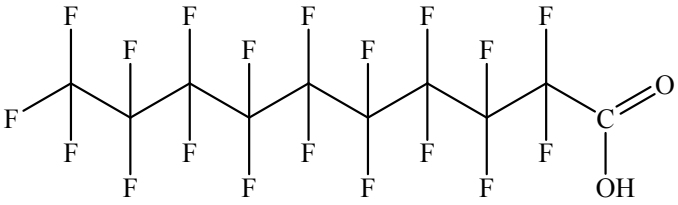
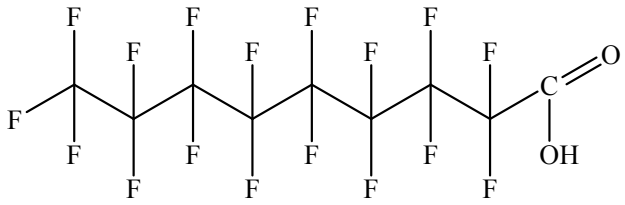
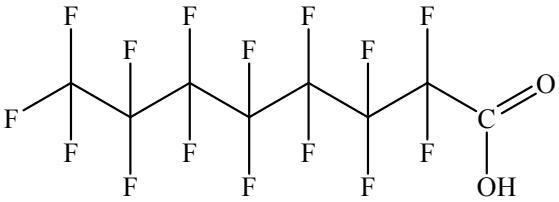
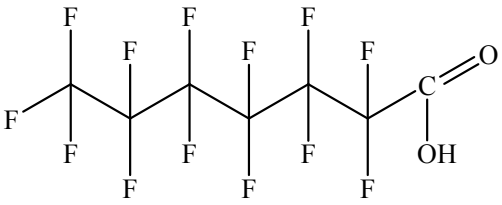
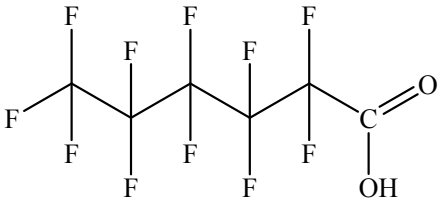
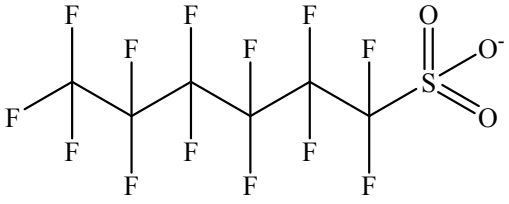
8. Method validation results

Table S1. Recoveries of PFOS spiked tap water samples and food packing samples using LC-MS/MS.

Sample	PFOS added (M)	PFOS found (M)	Recovery (%)
Tap water	1.80×10^{-10}	2.10×10^{-10}	116
Water bottle	1.80×10^{-10}	2.40×10^{-10}	133

9. Structures of six structural analogues of PFOS

Table S2. The structures of six structural analogues of PFOS.

Compound	Stucture	MW (g/mol)
PFOS		538.15
PFDA		514.09
PFNA		464.08
PFOA		414.20
PFHpA		364.06
PFHxA		314.05
PFHxS		438.00