

One-pot hydrothermal synthesis of luminescent silicon-based nanoparticles for highly specific detection of oxytetracycline *via* ratiometric fluorescent strategy

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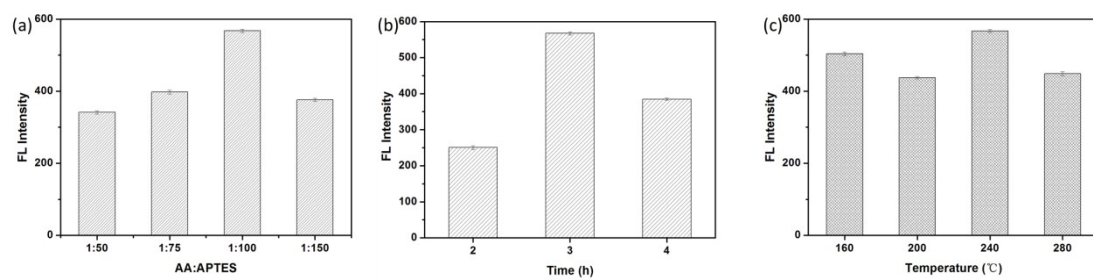


Fig. S1. Fluorescence intensity at 436 nm of 4 mM SiNPs being synthesized at various molar ratios of (a) AA to APTES, (b) reaction times, and (c) temperatures, respectively.

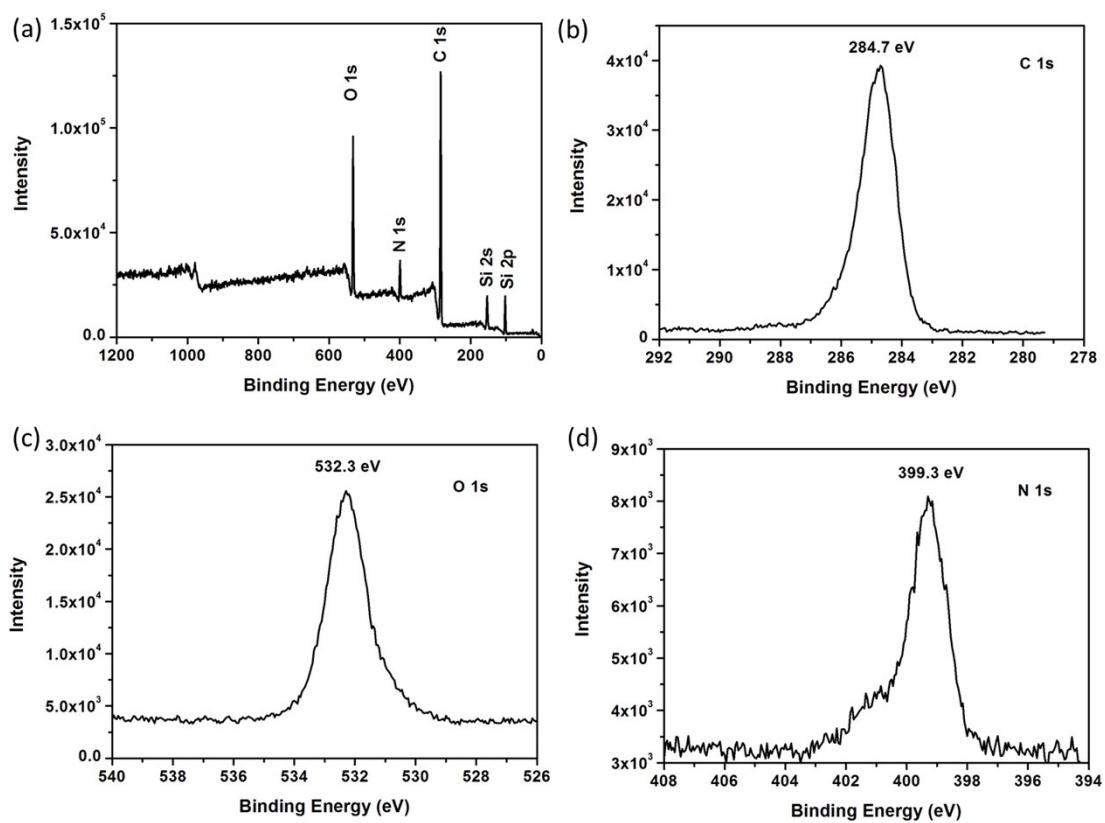


Fig. S2. (a) Wide scan XPS spectrum of the Si NPs, and enlarge regions of (b) C1s, (c) O1s and N1s XPS spectra.

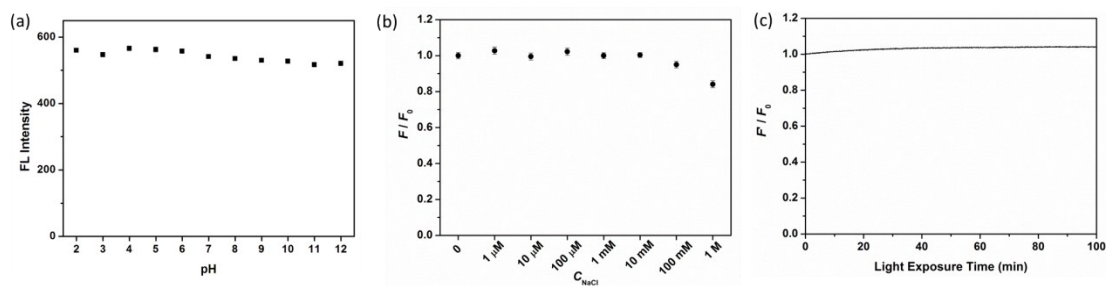


Fig. S3. (a) Fluorescence intensity of SiNPs in solutions under the conditions of various pH (BR buffer). (b) Relative fluorescence intensity (F/F_0) of SiNPs in the presence of various concentrations of NaCl in solution. F_0 and F are the fluorescence intensity in the absence and presence of NaCl solutions, respectively. (c) The time-dependent fluorescence changes of the SiNPs under 345 nm light illumination. F_0' and F' are the fluorescence intensity before and after the light exposure, respectively.

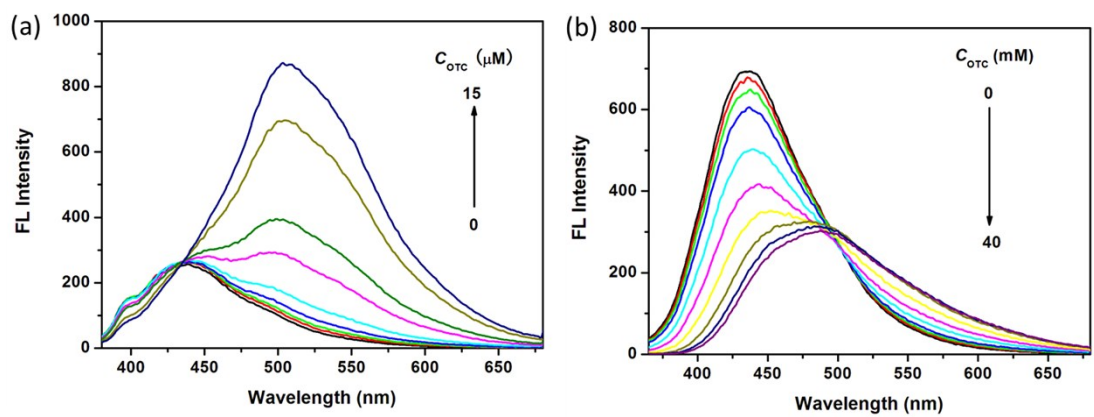


Fig. S4. FL response of (a) 2 mM and (b) 8 mM of SiNPs in the presence of various concentrations of OTC, respectively.

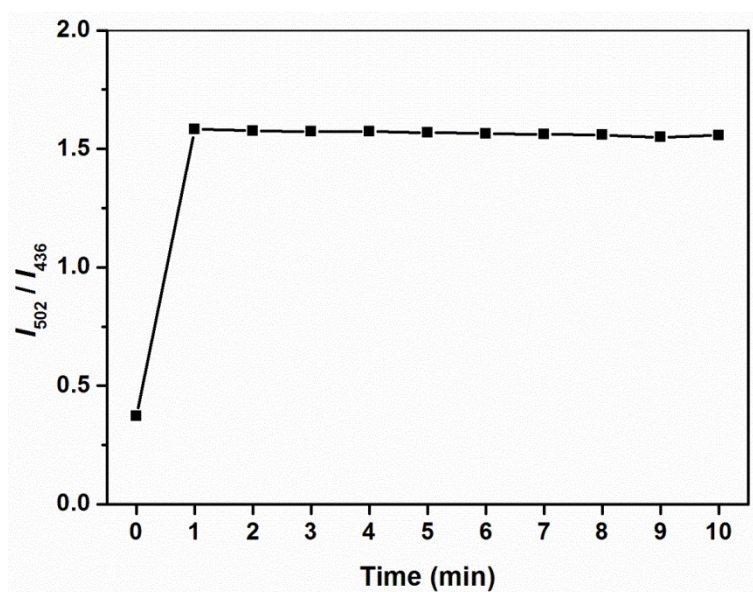


Fig. S5. The time-dependent fluorescence intensities change (I_{502}/I_{436}) of SiNPs (4 mM) toward OTC (20 μ M).

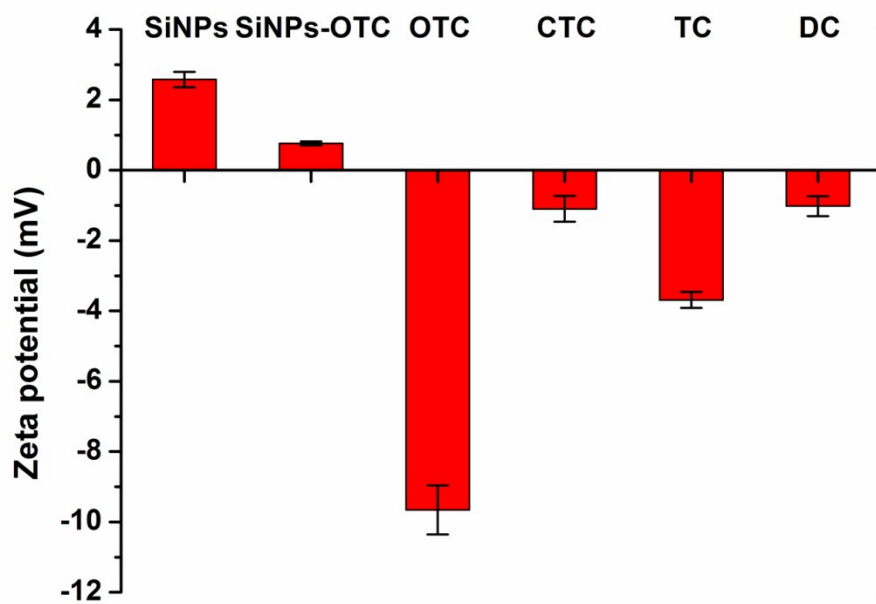


Fig. S6. Zeta potential of SiNPs, SiNPs-OTC, OTC, CTC, TC and DC in aqueous solution.

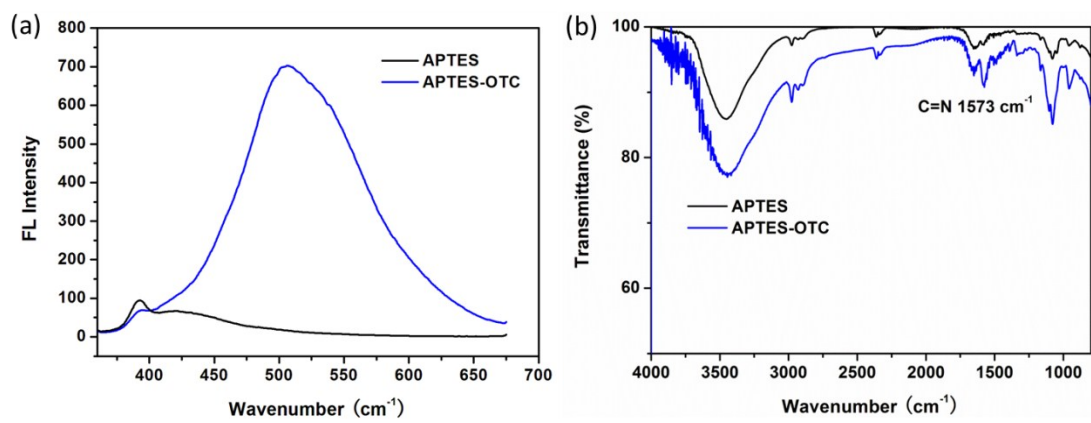


Fig. S7. (a) FL response and FT-IR spectra of APTES in absence and presence of OTC.

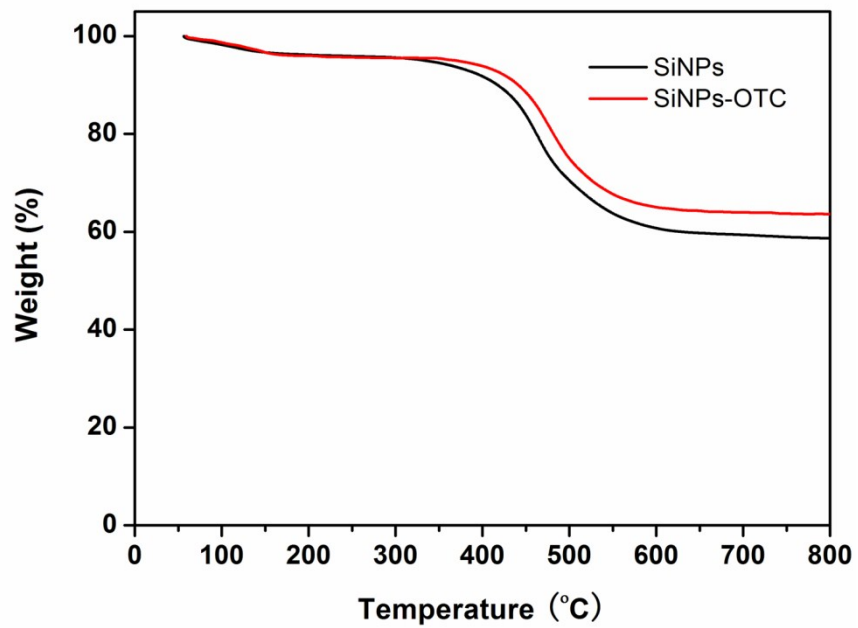
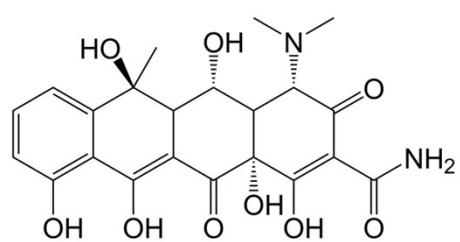
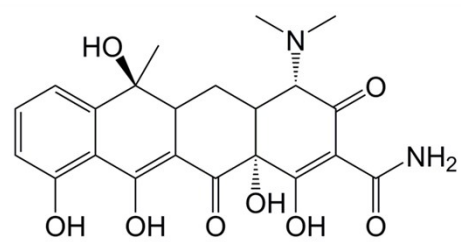


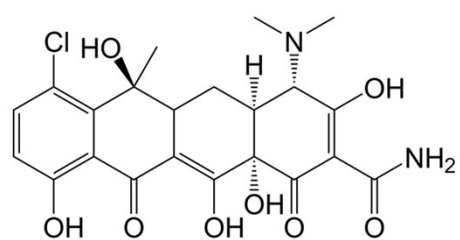
Fig. S8. Weight loss curves of SiNPs and SiNPs-OTC complex.



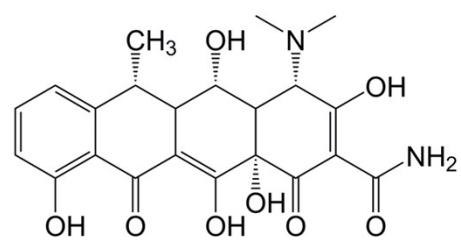
Oxytetracycline



Tetracycline

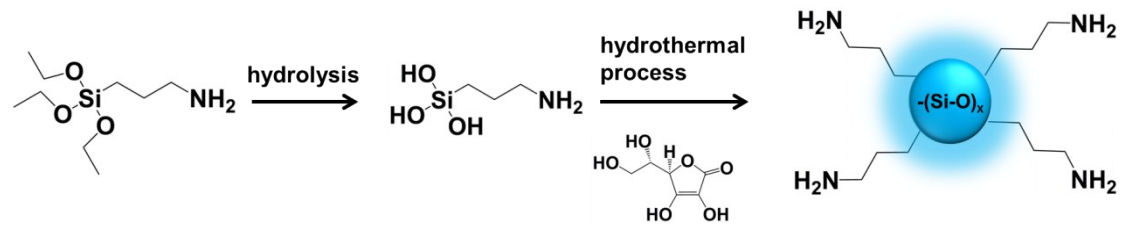


Chlortetracycline



Doxycycline

Scheme S1. Schematic structures of OTC, TC, CTC and DC.



Scheme S2. Schematic illustration of formation processes of SiNPs.

Table S1. Research papers available up to now concerning different fluorescent sensors for detection of OTC.

Ref. No.	Materials	LOD	Interference	Fluorescence response strategy
S1	NaYF ₄ :Yb NPs	0.054 ng/ml	-	ratiometric (I_{530}/I_{477})
S2	Carbon dots	0.03 μ M	TC, DC	Turn-off (I_{435})
S3	AuNPs	0.15 μ M	-	Turn-on (I_{510})
S4	BODIPY	0.72 μ M	Fe ³⁺ , TC	Turn-off (I_{515})
S5	Long-chain ssDNA	0.01 μ M	-	Turn-off (I_{520})
S6	Carbon dots	0.02 μ M	TC, CTC	Turn-off (I_{507})
S7	Europium-SiNPs	0.005 μ M	TC	ratiometric (I_{617}/I_{450})
This work	SiNPs	0.18 μ M	-	ratiometric (I_{502}/I_{436})

References in ESI

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