

Supplementary Information

Surfactant-Free Synthesis of Fluorescent Platinum Nanocluster Using HEPES

Buffer for Hypochlorous Acid Sensing and Imaging

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Reagents and Instrumental

NaCl (AR, $\geq 99.5\%$), KCl (AR, $\geq 99.5\%$), AgNO₃ (AR, $\geq 99.8\%$), CuCl₂·2H₂O (AR, $\geq 99.0\%$), ZnSO₄·7H₂O (AR, $\geq 99.5\%$), CaCl₂·2H₂O (AR), MnSO₄·H₂O (AR, $\geq 99.0\%$), MgSO₄ (AR, $\geq 98.0\%$), AlCl₃·6H₂O (AR, $\geq 97.0\%$), CoSO₄·7H₂O (AR, $\geq 99.5\%$), FeSO₄·7H₂O (AR), FeCl₃·6H₂O (AR) and H₂O₂ (AR, $\geq 30\%$) were purchased from Sinopharm Chemical Reagent Co., Ltd. (China). Glutathione (GSH), cysteine (Cys), homocysteine (Hcy), glucose, sodium hypochlorite solution (reagent grade, available chlorine 4.00-4.99%), chloroplatinic acid hexahydrate (ACS reagent), Phorbol 12-myristate 13-acetate (PMA), *N*-acetyl-L-cysteine (NAC) and lipopolysaccharide (LPS) were purchased from Sigma-Aldrich Co. Ltd. (U.S.A.). HEPES buffer (1 M, pH 7.2- 7.4) was purchased from Beijing Soleibao Technology Co., Ltd. All aqueous solutions were prepared by deionized water (18.25 M Ω ·cm).

TEM (Transmission electron microscopic) images were obtained with a Hitachi HT 7700 TEM instrument. The fluorescence and UV absorption spectra were acquired by a Hitachi F-2500 fluorescence spectrophotometer and Hitachi U-3900 spectrophotometer, respectively. The zeta potential was obtained with a Malvern Zetasizer Nano. The representative fluorescence images were in bottles were acquired by a Fusion FX7 imaging instrument (VILBER). The confocal fluorescence images were carried out on a confocal laser scanning microscope (TCS SP8, Leica, Germany).

Table S1. Comparison of other nanoprobes for sensing of ClO⁻.

Nanoprobes	Surface group	Linear Range (μ M)	Synthesis steps	Application	References
CdSe-ZnS quantum dots	Poly-NHMe	0-0.83	Three steps	Cells imaging	<i>Anal. Chem.</i> 2010, 82 , 9775–9781.
N-doped carbon dots	GSH	60-150	One step	Cells imaging	<i>Analyst</i> , 2018, 143 , 5834-5840.
Cu NCs	PVP	0-6	Two steps	Tap water sample	<i>ACS Appl. Nano Mater.</i> 2020, 3 , 312-318.
Au NCs	BSA	0.8-800	One step	Tap water sample	<i>Talanta</i> , 2015, 132 , 790-795.
CD/CCM@ZIF-8	--	0.1-50	Two steps	Serum sample	<i>Anal. Chem.</i> 2020 , <i>92</i> , 3447-3454.
PFOBT ₃₆ SeTBT ₅ Polymer dots	PEG	0-250	Multi-step organic synthesis	Cell imaging	<i>J. Am. Chem. Soc.</i> 2017 , <i>139</i> , 6911-6918.
MoS ₂ quantum dots	GSH	5-500	One step	Tap water sample	<i>Microchimica Acta</i> , 2018, 185 , 233.
Pt NCs	Hepes (Surfactant-free)	5-160	One step	Cell imaging	This work.

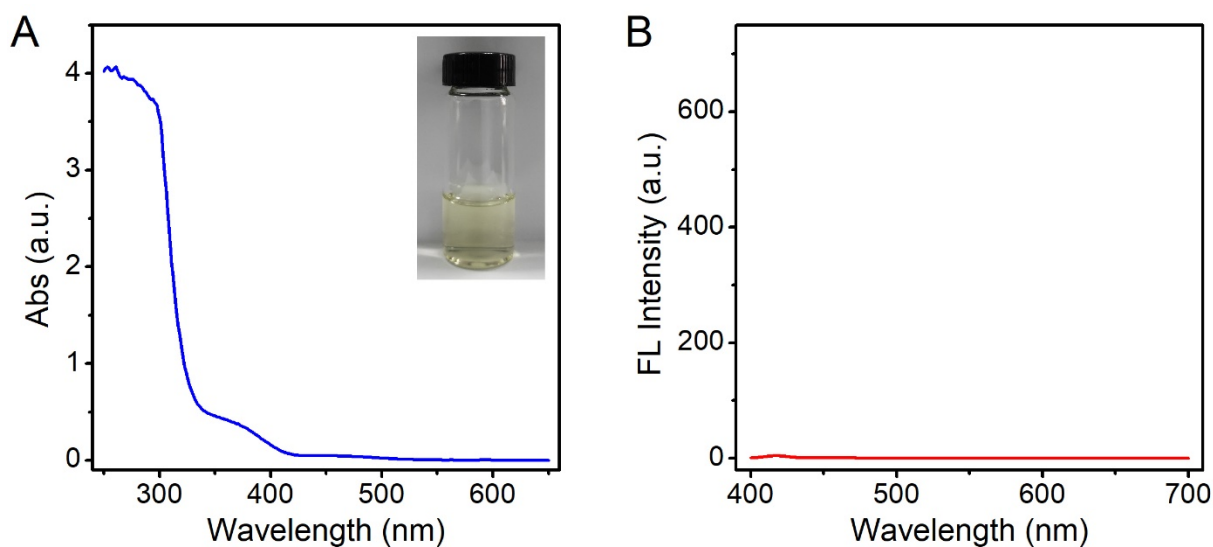


Figure S1. The absorption spectrum (A) and fluorescence spectrum (B) at 0 h reaction time.

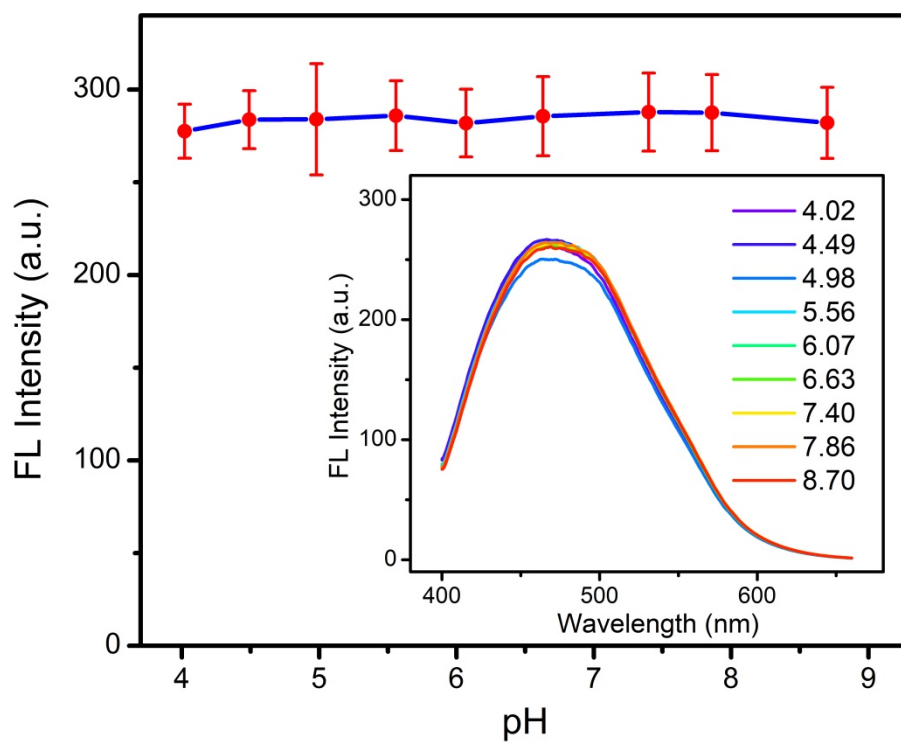


Figure S2. The relationship between the fluorescence intensity and pH value in 10 mM PBS buffer.

The inset is the pH-dependent fluorescence spectra of Pt NCs.

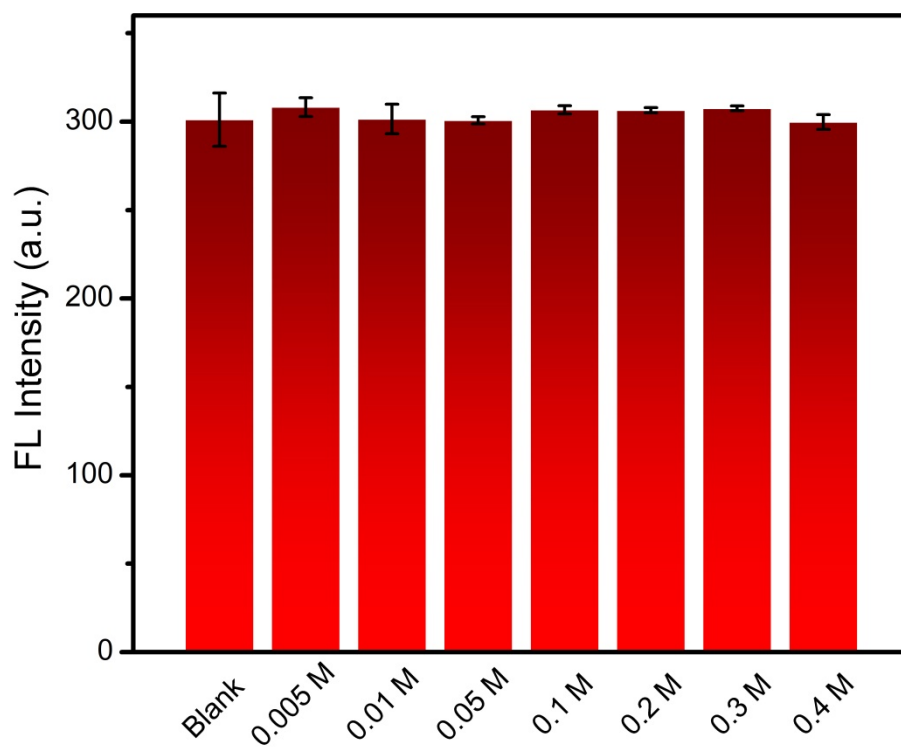


Figure S3. The dependence of ionic strength (I) on the fluorescence intensity of Pt NCs.

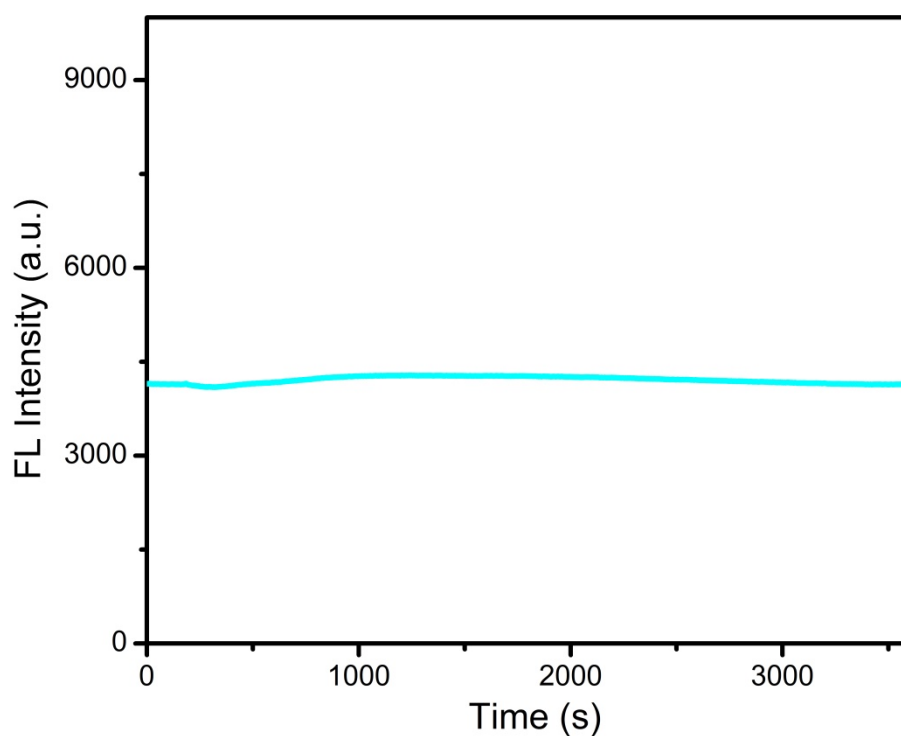


Figure S4. Photostability experiment of the Pt NCs in PBS buffer (10 mM, pH= 7.4). Voltage of xenon lamp: 700 V, slit: 15×15 . Ex=405 nm. The concentration of Pt NCs is 10 $\mu\text{g}/\text{mL}$.