Supporting Information

Pt_2Ag Acetylides-Doped Silica Nanoparticles: Enabling Luminescence of Pt_2Ag Complexes in Water and Sensors for Highly Sensitive Detection of Cyanide Anion

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Characterizations

Size distribution determined by DLS

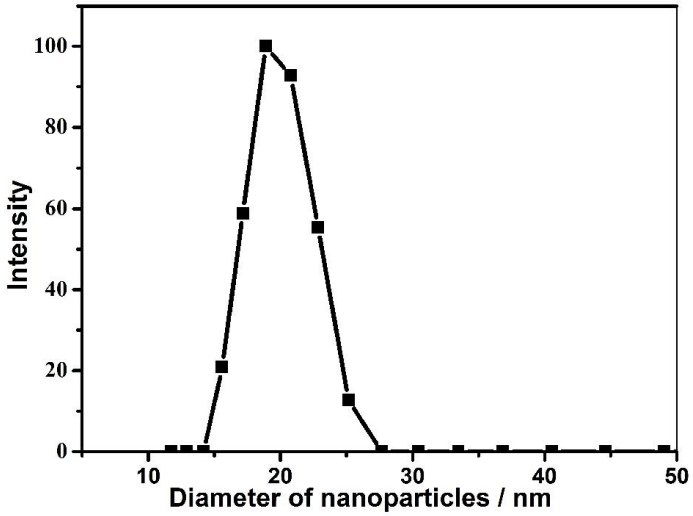

Fig. S1 Size distribution of **1@SiO_2** nanoparticles determined by DLS.

Characterizations

TEM and AFM Images

(A) **(B)**

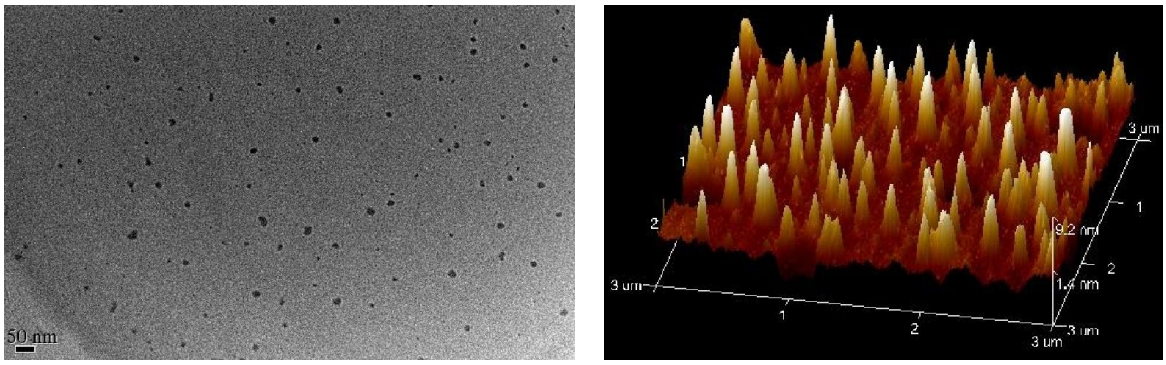

Fig. S2 Transmission electron microscopic (A) and atomic force microcopic (B) image of **1@SiO_2** nanoparticles in aqueous solution.

Photophysical Properties

UV-Vis absorption spectra

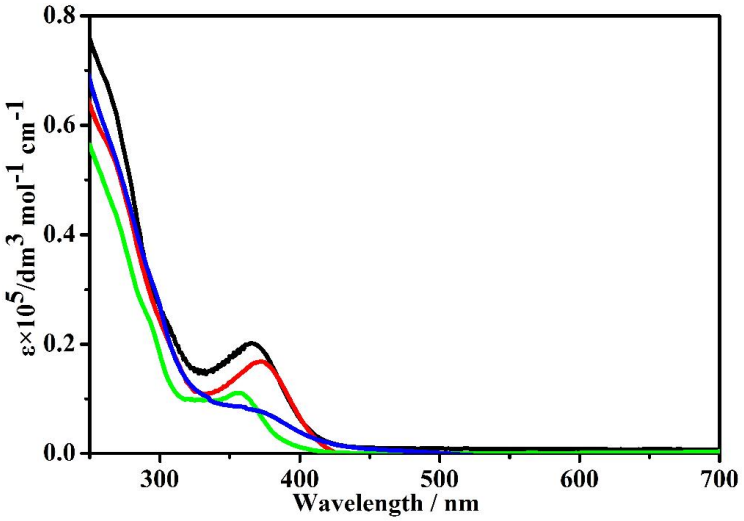

Fig. S3 UV–Vis absorption spectra of **1** (black line), **2** (red line) in CH_2Cl_2 solution and **1@SiO$_2$** nanoparticles (green line), **2@SiO$_2$** nanoparticles (blue line) in aqueous solution at 298 K.

Photophysical Properties

Emission spectra

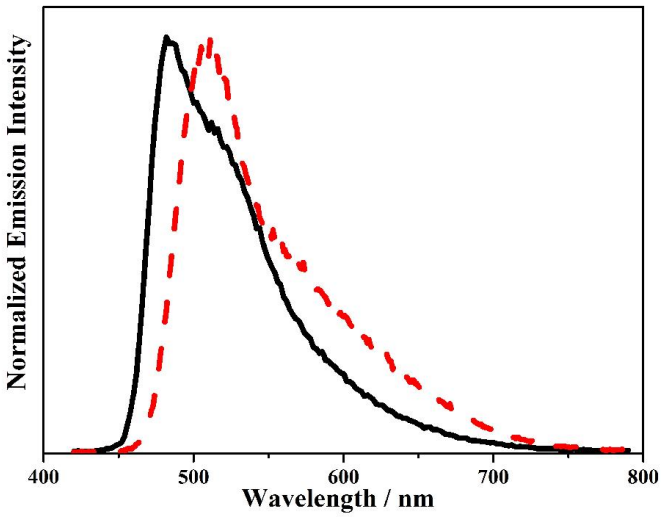

Fig. S4 Emission spectra of compounds **1** (solid line) and **2** (dash line) in the solid state at 298 K.

Photophysical Properties

Emission spectra

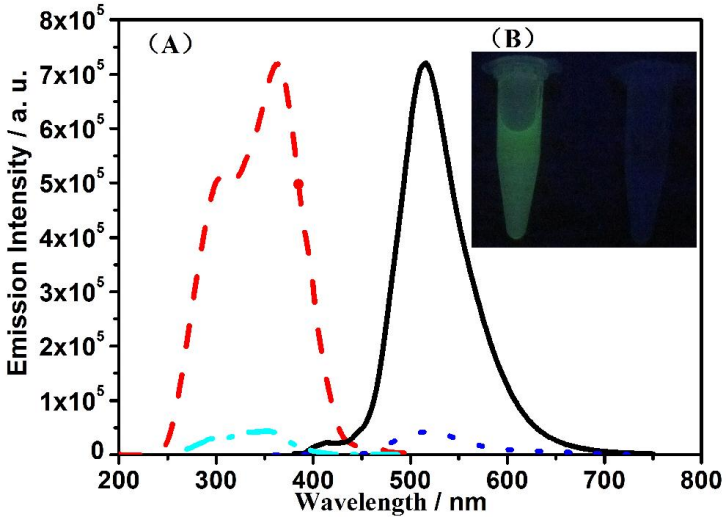

Fig. S5 (A) Excitation and emission spectra of **1@SiO$_2$** nanoparticles in aqueous solution: λ_{em} 518 nm (red dash line), λ_{exc} 363 nm (black solid line), and compound **1** in acetonitrile / water (1:1, v:v) solution: λ_{em} 518 nm (cyan dash dot line), λ_{exc} 350 nm (blue dot line); (B) Photos of the emission of **1@SiO$_2$ nanoparticles** in water (left) and compound **1** in acetonitrile / water (1:1, v:v) solution (right).

Determination of Cyanide Anion

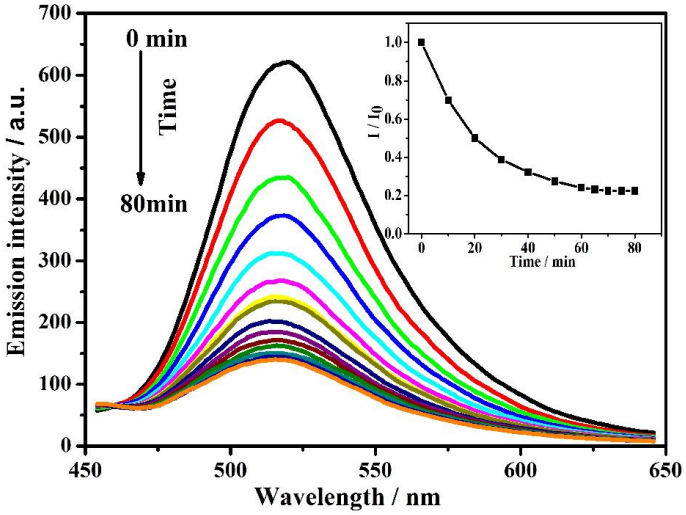

Fig. S6 Time-dependent emission response of the **1@SiO$_2$** nanoparticles to 2.0 μM CN^- in $NaHCO_3$–NaOH buffer solution (pH 11.0). The inset shows I / I_0 plotted against time in the presence of 2.0 μM CN^-, where I_0 and I are the emission intensity of the **1@SiO$_2$** nanoparticles at 518 nm in the absence and presence of CN^-, respectively.

Determination of Cyanide Anion

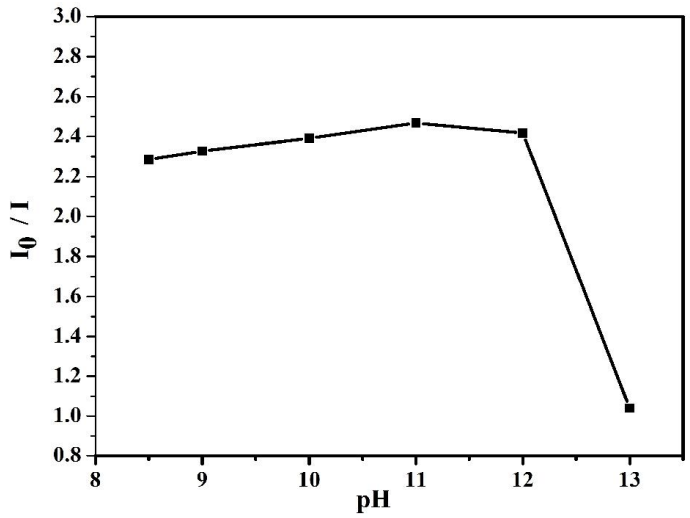

Fig. S7 The emission response of **1@SiO_2** nanoparticles to 5.0 μM CN^- at different pH value in $NaHCO_3$–NaOH buffer solution.

Determination of Cyanide Anion

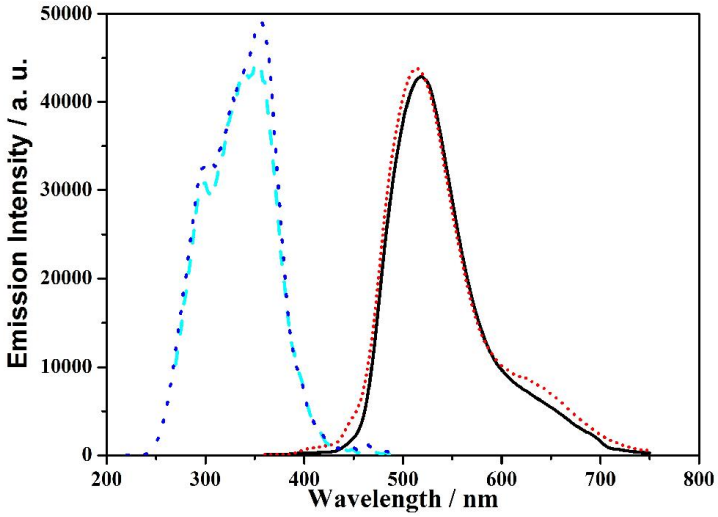

Fig. S8 Excitation and emission spectra of the acetonitrile / $NaHCO_3$–NaOH buffer (1:1, v:v, pH 11.0) solution of 50.0 μM complex **1** without [λ_{em} 518 nm (cyan dash line), λ_{exc} 350 nm (black solid line)], and with 10.0 μM CN^- [λ_{em} 518 nm (blue dot line), λ_{exc} 350 nm (red short dot line)].

Determination of Cyanide Anion

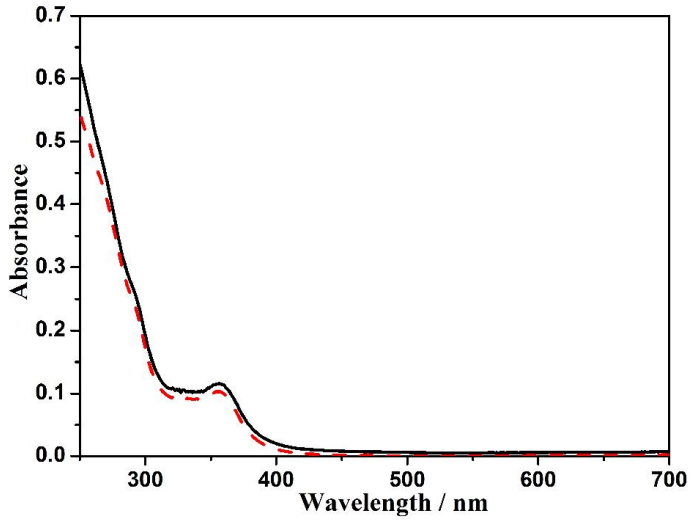

Fig. S9 UV–Vis absorption spectra of **1@SiO$_2$** nanoparticles in $NaHCO_3$–NaOH buffer solution (pH 11.0) (black line), and upon addition of 10.0 μM CN^- (red line).

Table S1. Crystallographic Data for Compound **2**•$2CH_2Cl_2$

Compound	$2•2CH_2Cl_2$
empirical formula	$C_{96}H_{78}AgCl_5N_2O_4P_4Pt_2$
fw	2122.78
space group	*P*2(1)/*c*
a, Å	13.4625(14)
b, Å	25.739(3)
c, Å	25.325(3)
β, deg	94.556(2)
V, $Å^3$	8747.6(16)
Z	4
ρ_{calcd}, g/cm^3	1.612
μ, mm^{-1}	3.691
radiation (λ, Å)	0.71073
temp, K	273 (2)
R1 (F_o)	0. 1090
wR2(F_o^2)	0.2017
GOF	1.034

[a] $R1 = \Sigma|F_o - F_c|/\Sigma F_o$ [b] $wR2 = \Sigma[w(F_o^2 - F_c^2)_2]/\Sigma[w(F_o^2)]^{1/2}$