Electronic Supplementary Material (ESI) for Analytical Methods.

Supporting Information

Visual determination of ferric ions in aqueous solution based on a high selectivity and sensitivity ratiometric fluorescent nanosensor

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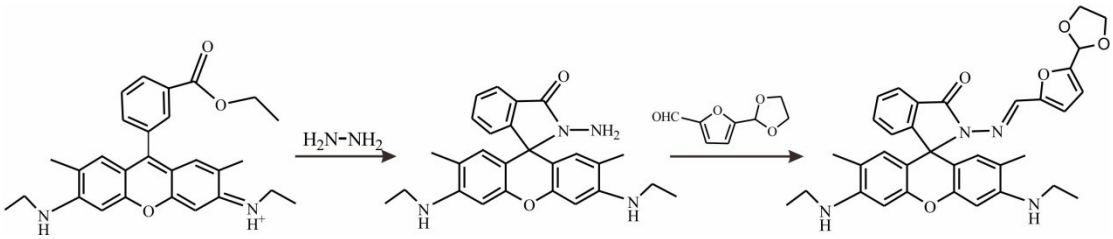

Scheme.S1. The synthetic route of the RhB

^{1}H NMR (400MHz, $CDCl_3$) δ (ppm): 7.97 (d, 1H), 7.45 (m, 4H), 7.11 (d, 1H), 6.48 (m, 4H), 6.20 (m, 2H), 3.91 (m, 6H), 3.31(m, 4H), 2.31 (s, 6H), 1.15 (t, 6H).

^{13}C NMR (400MHz, d_6-DMSO) δ (ppm): 165.46, 156.82, 152.11, 150.14, 140.95, 134.45, 129.08, 127.16, 122.02, 120.71, 118.51, 61.32, 49.79, 15.97, 13.74.

Elemental analysis: calcd for $C_{34}H_{34}N_4O_5$: C, 70.57; H, 5.92; N, 9.68. Found: C,

70.22; H, 5.84; N, 9.97.

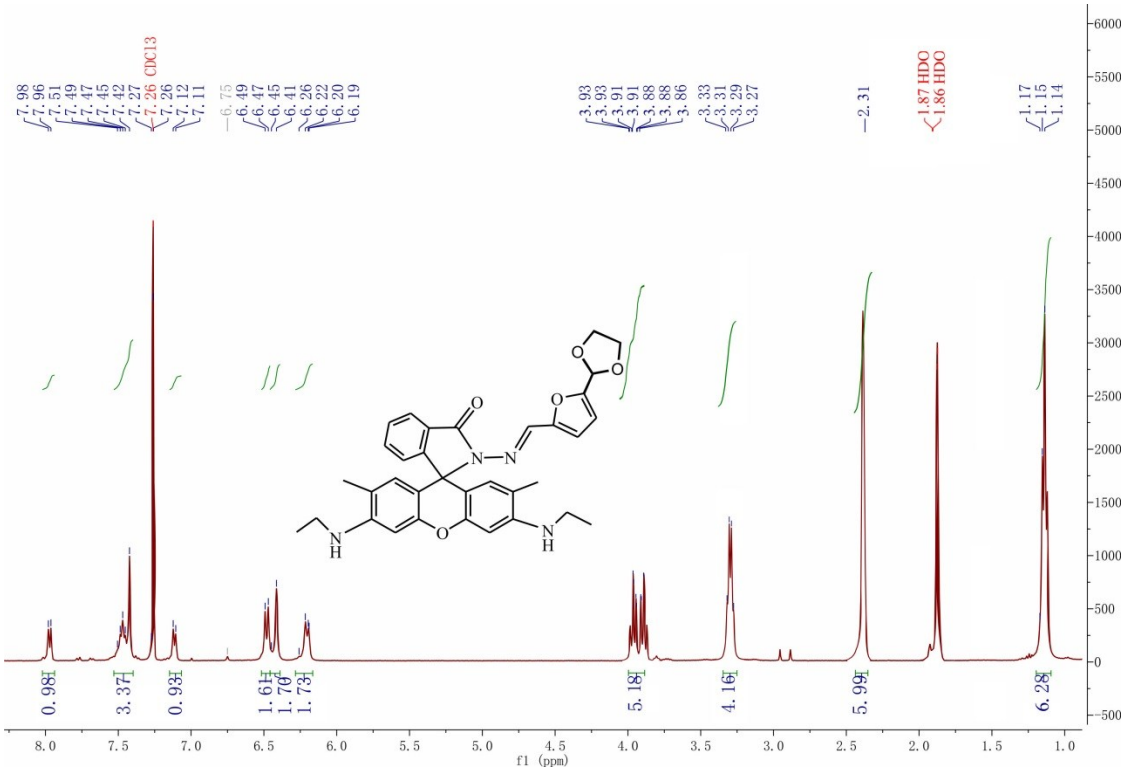

Fig. S1. The ^{1}H NMR spectrum of RhB in $CDCl_3$

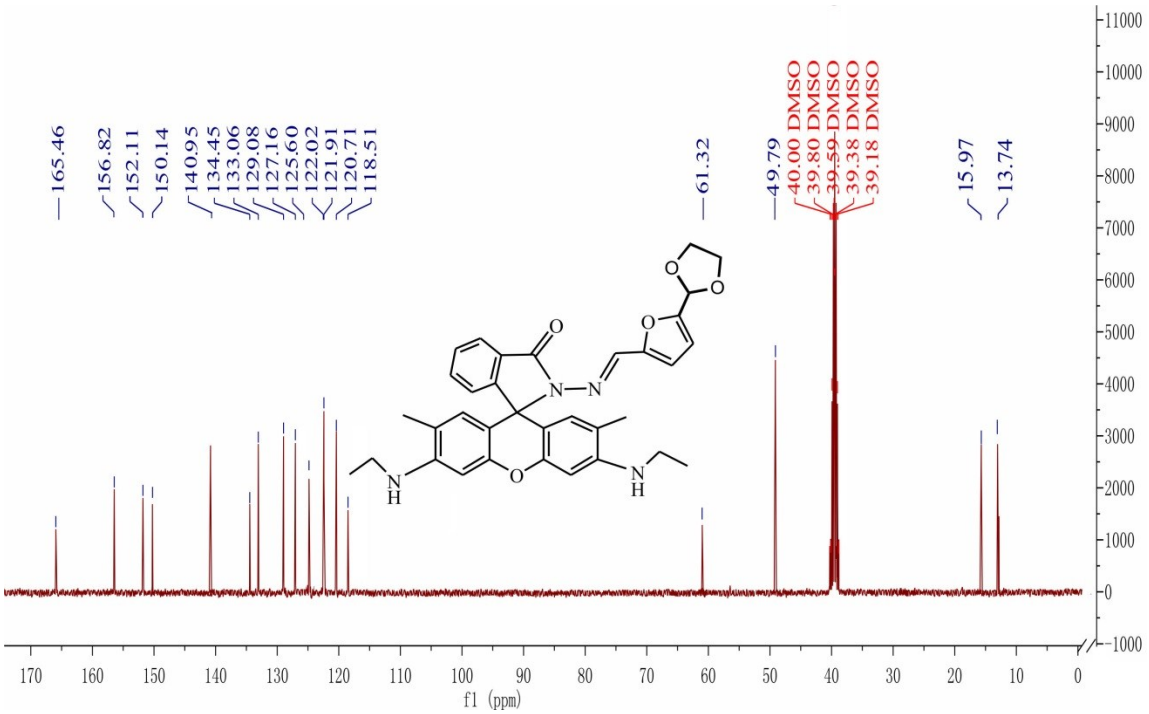

Fig. S2 The ^{13}C NMR spectrum of RhB in d_6-DMSO

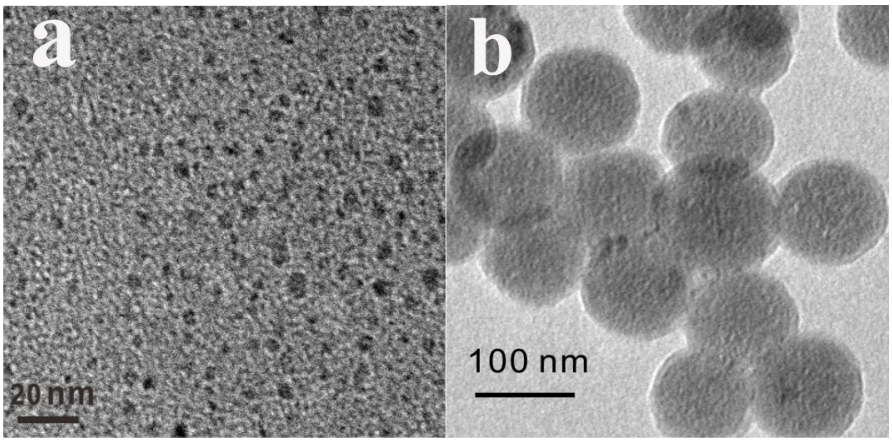

Fig. S3. The TEM image of (a) CdTe QDs and (b) CdTe@SiO_2 QDs.

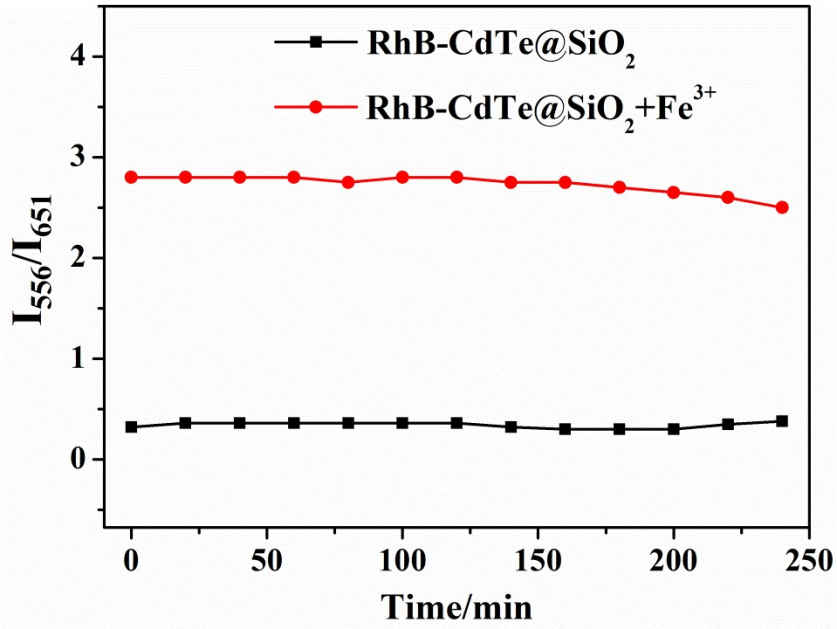

Fig. S4. (a) The stability of the RhB-CdTe@SiO_2 QDs sensor in acetonitrile/water mixtures (1:4 v/v, 1/1; pH=7.0). (B) The stability of the RhB-CdTe@SiO_2 QDs sensor in the presence of 4.5 μM of Fe^{3+}.

Table S1 The comparison of the LOD and linear range for the detection of Fe^{3+} by other rhodamine-based fluorescence sensor.

Rhodamine-based fluorescence sensor for Fe^{3+}	LOD	linear ranges(mol/L^{-1})
An “off-on” rhodamine-based fluorescence probe [1]	14 nM	6.0×10^{-8}-7.2×10^{-6}
Ferric ion chemosensor based on rhodamine derivative [2]	0.32 μM	0-2.0×10^{-5}
Rhodamine-based "off-on" chemosensors for ferric ion [3]	5.0 μM	5.0×10^{-6}-2.0×10^{-5}
Rhodamine hydroxamate as fluorescent chemosensor [4]	1.0 μM	1.0×10^{-6}-2.0×10^{-5}
Rhodamine-based thiacalix[4]arene fluorescent sensor [5]	35.0 nM	5.0×10^{-6}-6.0×10^{-5}
This Work	20.5 nM	0-3.5×10^{-6}

References

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