

Supporting Information

An “on-off-on” fluorescence assay based on silicon nanoparticles for selective detection of manganese (II)

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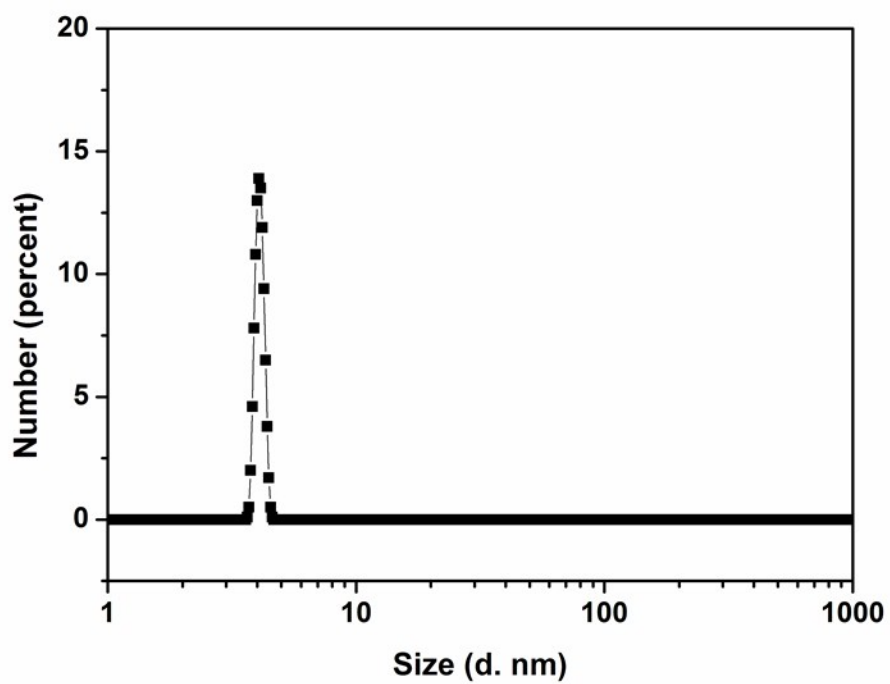


Fig. S1 DLS size characterization of well dispersed Si NPs

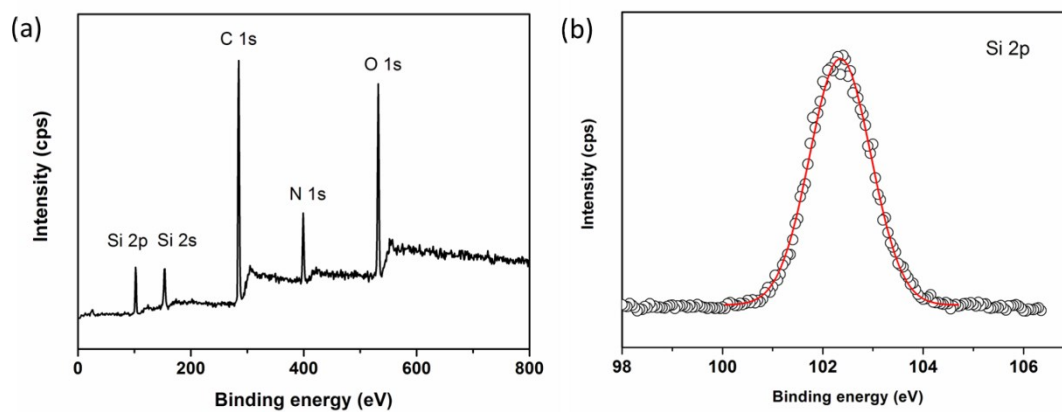


Fig. S2 High resolution XPS spectra of (a) full range and (b) Si 2p peak of the Si NPs.

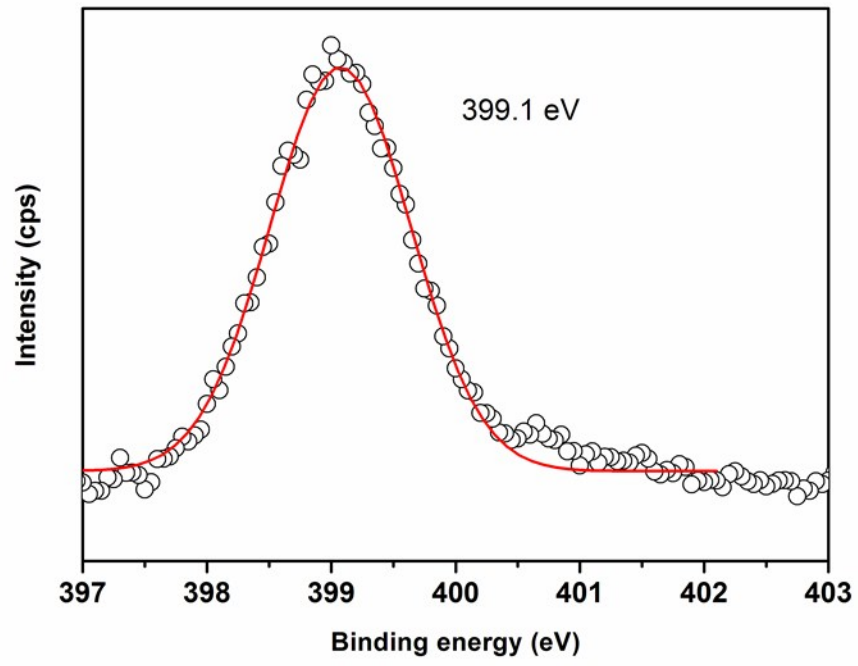


Fig. S3 XPS spectra of as-prepared Si NPs

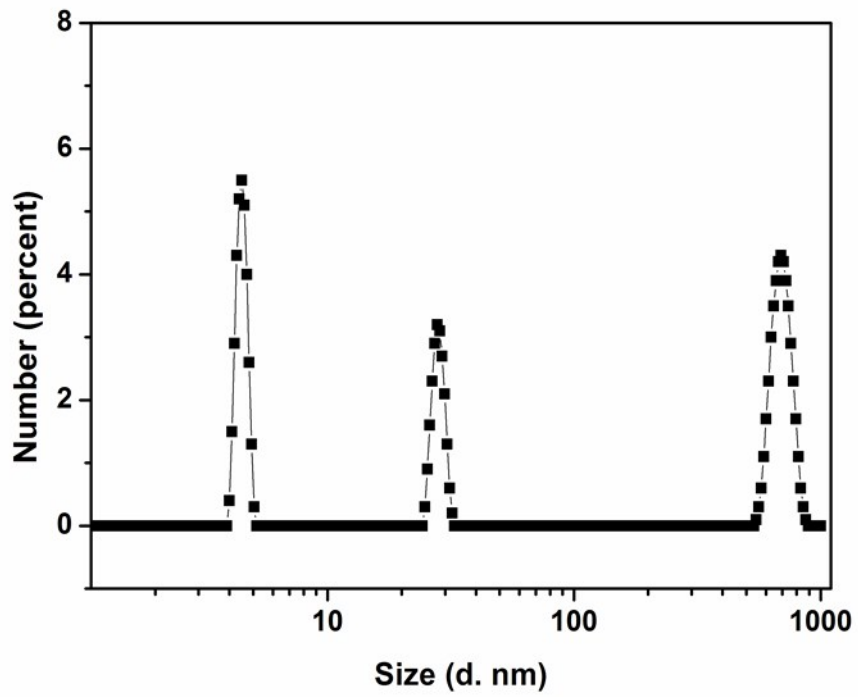


Fig. S4 DLS size characterization of Si NPs after addition of Mn^{2+}

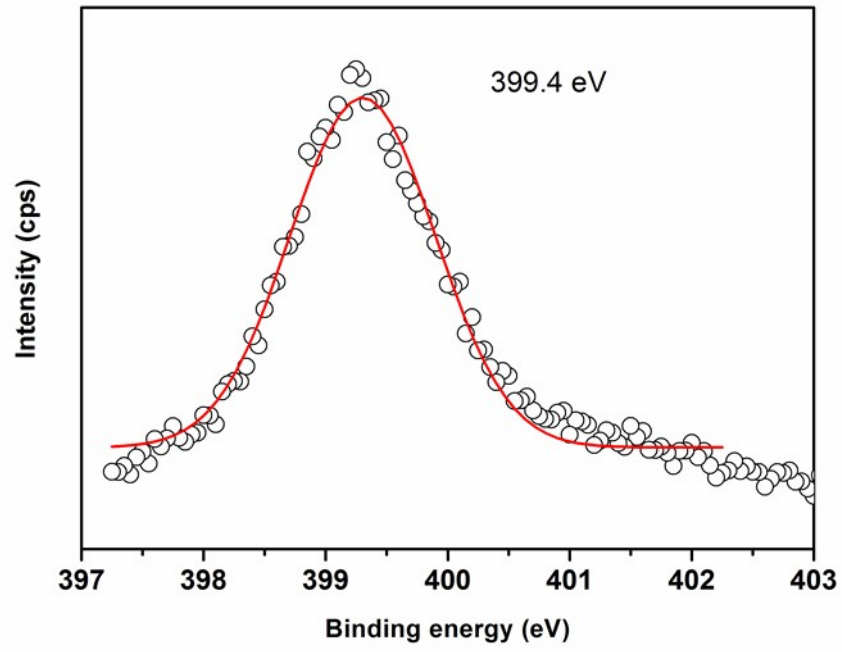


Fig. S5 XPS spectra of Si NPs after addition of Mn^{2+}

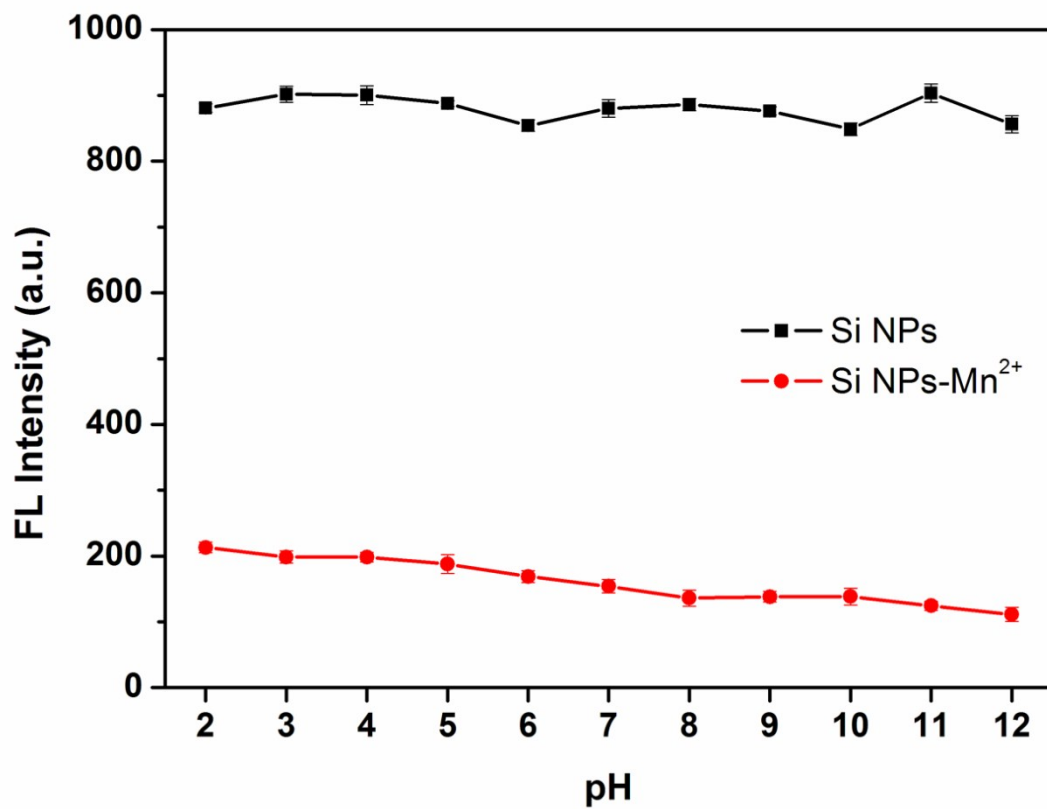


Fig. S6 Relationship between fluorescence intensity of Si NPs (100 μ M) and pH in the absence (black line) and presence of Mn²⁺ (500 μ M, red line).

Table S1. Reports of some sensors for Mn²⁺ detection

sensors	methods	detection limit(μM)	reference
Grapheme nanosheets	fluorescence	46.0	[1]
Schiff base	colorimetric	6.03	[2]
Schiff base	colorimetric	7.11	[3]
Schiff base	colorimetric	5.00	[4]
copper nanoparticles	fluorescence	1.60	[5]
Si QDs/aza18C6	fluorescence	0.47	[6]

References of Table S1

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- [2] Lee Y J, Lim C, Suh H, et al. A multifunctional sensor: chromogenic sensing for Mn^{2+} and fluorescent sensing for Zn^{2+} and Al^{3+} [J]. Sensors and Actuators B: Chemical, 2014, 201: 535-544.
- [3] Kim K B, Park G J, Kim H, et al. A novel colorimetric chemosensor for multiple target ions in aqueous solution: simultaneous detection of Mn (II) and Fe (II)[J]. Inorganic Chemistry Communications, 2014, 46: 237-240.
- [4] Hariharan P S, Anthony S P. Substitutional group dependent colorimetric/fluorimetric sensing of Mn^{2+} , Fe^{3+} and Zn^{2+} ions by simple Schiff base chemosensor[J]. Spectrochimica Acta Part A: Molecular and Biomolecular Spectroscopy, 2015, 136: 1658-1665.
- [5] Ma S Y, Yeh Y C. One-step synthesis of water-soluble fluorescent copper nanoparticles for label-free detection of manganese ions[J]. Analytical Methods, 2015, 7(16): 6475-6478.
- [6] Dhenadhayalan N, Lee H L, Yadav K, et al. Silicon Quantum Dot-Based Fluorescence Turn-On Metal Ion Sensors in Live Cells[J]. ACS Applied Materials & Interfaces, 2016, 8(36): 23953-23962.