

Supporting Information

Rhodamine B-based ordered mesoporous organosilicas for selective detection and adsorption of Al(III)

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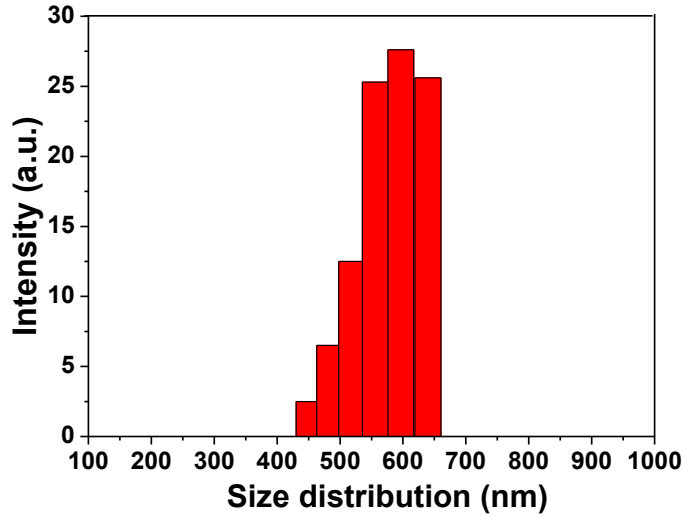


Fig. S1 Size distribution histograms of RBMSiO₂-20 in ethanol.

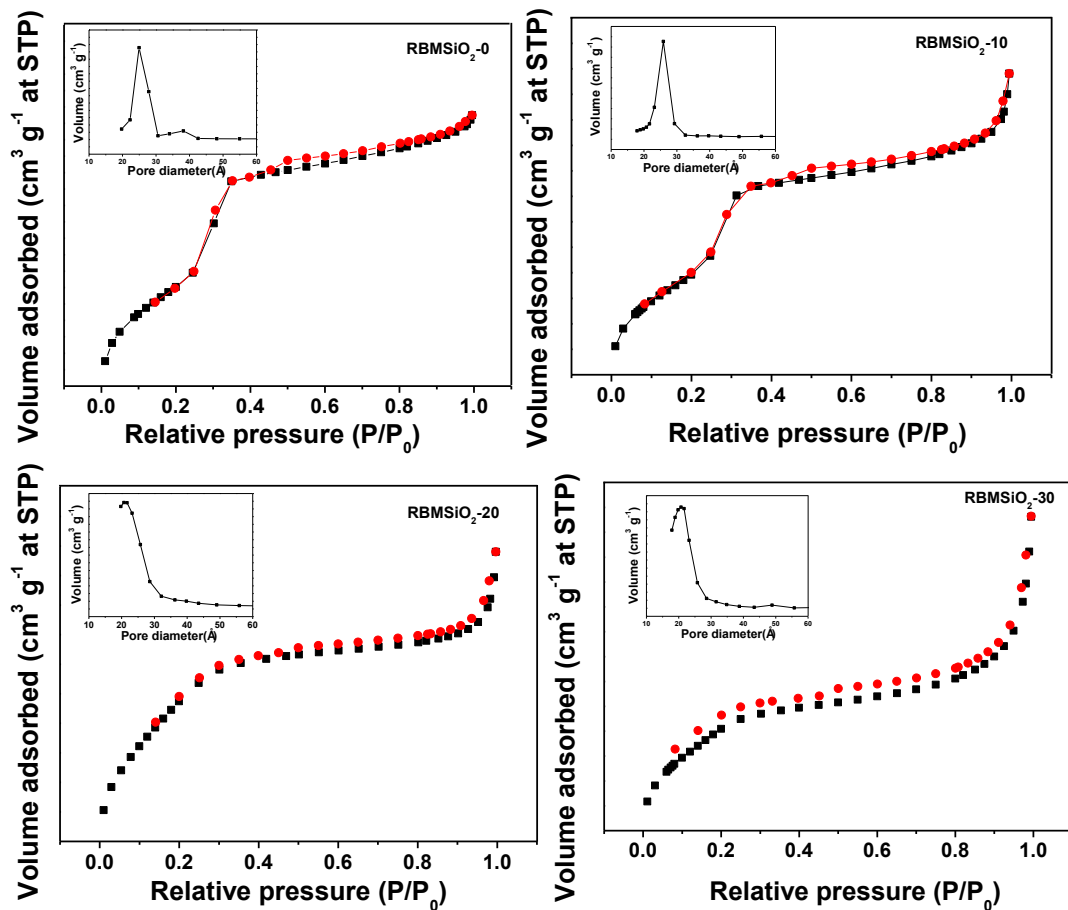


Fig. S2 Nitrogen adsorption/desorption isotherms and corresponding pore size distribution of RBMSiO₂-0, RBMSiO₂-10, RBMSiO₂-20 and RBMSiO₂-30 after extraction.

Table S1. Surface properties of RBMSiO₂ samples.

Sample	S_{BET} (m ² /g)	V_t (m ³ /g)	D_{BJH} (nm)
RBMSiO ₂ -0	1041.97	0.79	2.5
RBMSiO ₂ -10	131.01	0.11	2.5
RBMSiO ₂ -20	127.44	0.09	2.1
RBMSiO ₂ -30	46.00	0.05	2.1

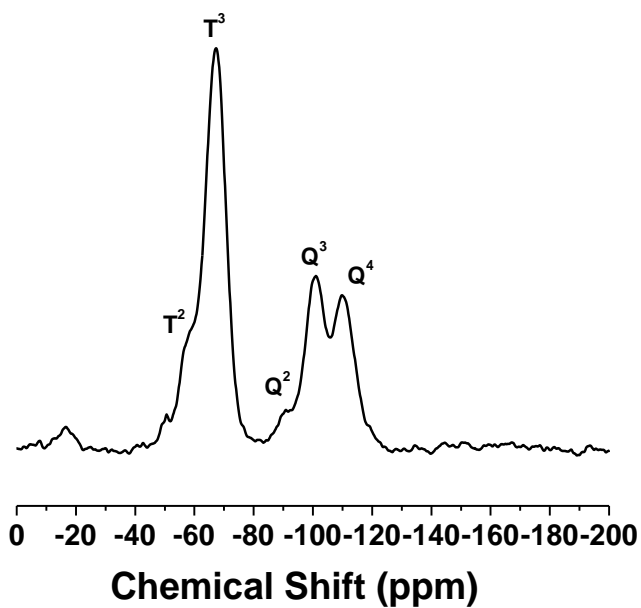


Fig. S3 ²⁹Si MAS NMR spectrum of RBMSiO₂-30.

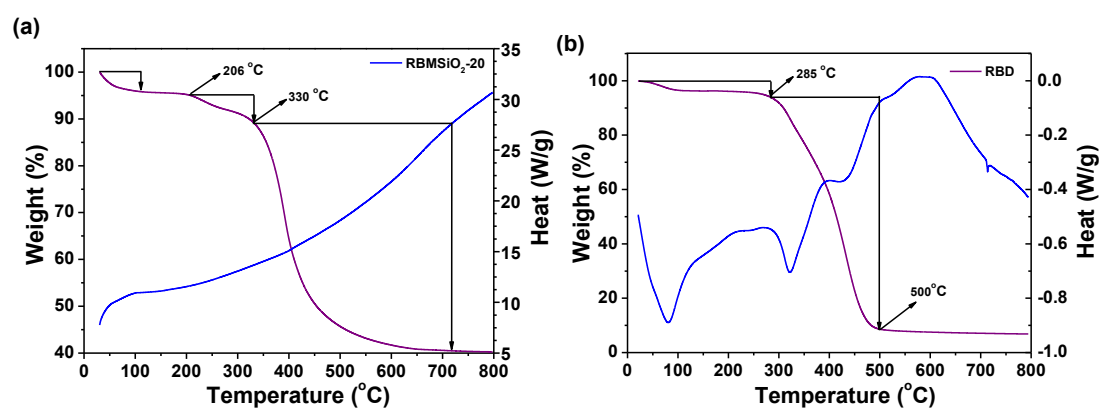
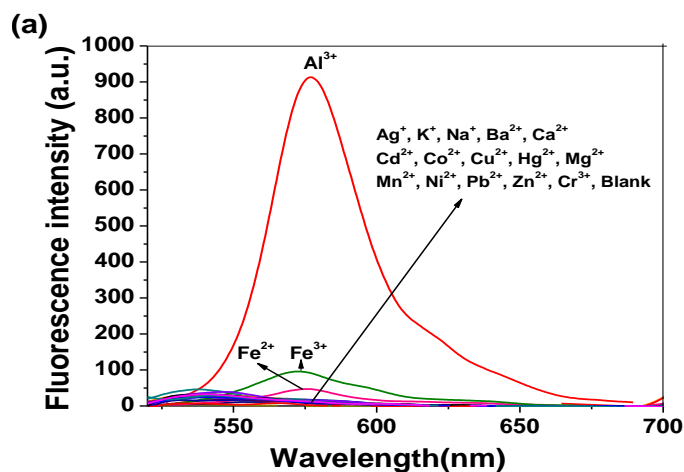


Fig. S4 TGA / DSC of (a) RBMSiO₂-20 and (b) RBD.



(b)

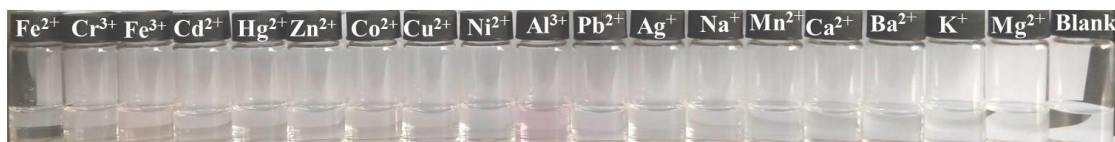


Fig. S5 (a), Fluorescence spectra of RBD (10^{-5} mol/L) upon addition of various metal ions (10^{-4} mol/L) in ethanol. Excitation at 510 nm (Excitation slit width, 3 nm; emission slit width, 2.5 nm). (b) Color changes of RBD in ethanol in the presence of various metal ions (10^{-4} mol/L).

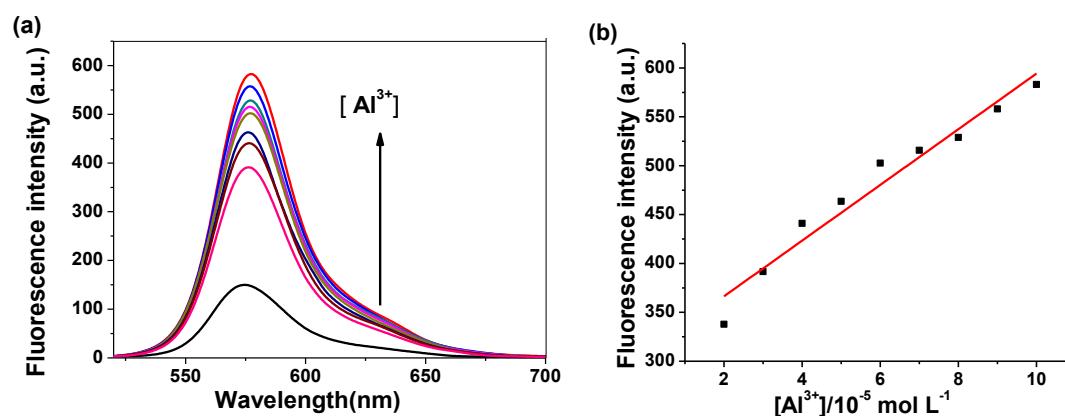


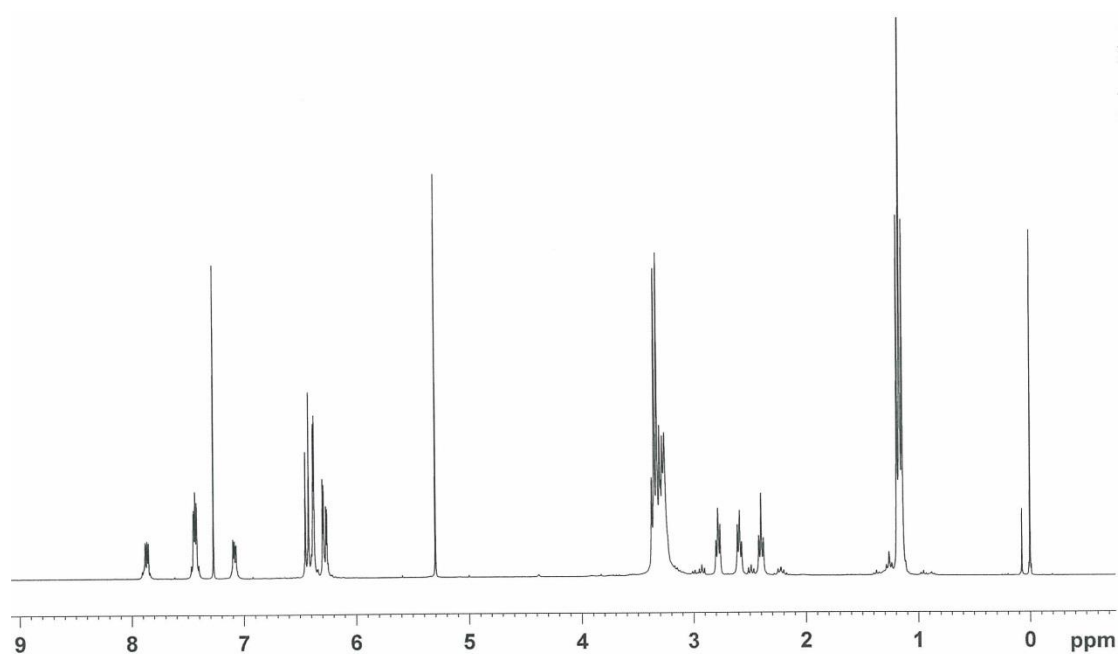
Fig. S6 (a) Fluorescence spectra of RBMSiO₂-20 (0.05 mg/mL) upon addition of Al^{3+} in ethanol. (b) Emission intensities at 575 nm of RBMSiO₂-20 (0.05 mg/mL) as a function of Al^{3+} concentration in 10^{-5} M range (2×10^{-5} to 1×10^{-4} mol/L). (Excitation slit width, 5.5 nm; emission slit width, 2.5 nm).

Table S2 The comparison of this probe with some other fluorescent probes for Al³⁺.

Probe	λ_{em} (nm)	LOD (μ M)	Total metal ions ^a	Interferents	Recycle ^b
Ref. [1]	442	0.012	14	No	No
Ref. [2]	603	0.5	16	No	Yes
Ref. [3]	400	1.06	21	Cr ³⁺ , Co ²⁺ , Ga ³⁺ , In ³⁺	No
Ref. [4]	443	0.1	16	No	No
Ref. [5]	529	0.1	19	Ga ³⁺	No
Ref. [6]	398	0.393	14	No	Yes
Ref. [7]	582	0.196	21	No	No
Ref. [8]	637	0.8	14	No	No
Ref. [9]	513	2.4	14	No	No
Ref. [10]	560/410	38	12	Fe ³⁺ , Fe ²⁺	No
This work	575	0.13	18	No	Yes

^a The total species of tested interference ions.

^b Recycling or reproducibility performance.

**Fig. S7** ¹H-NMR spectra of RBD.

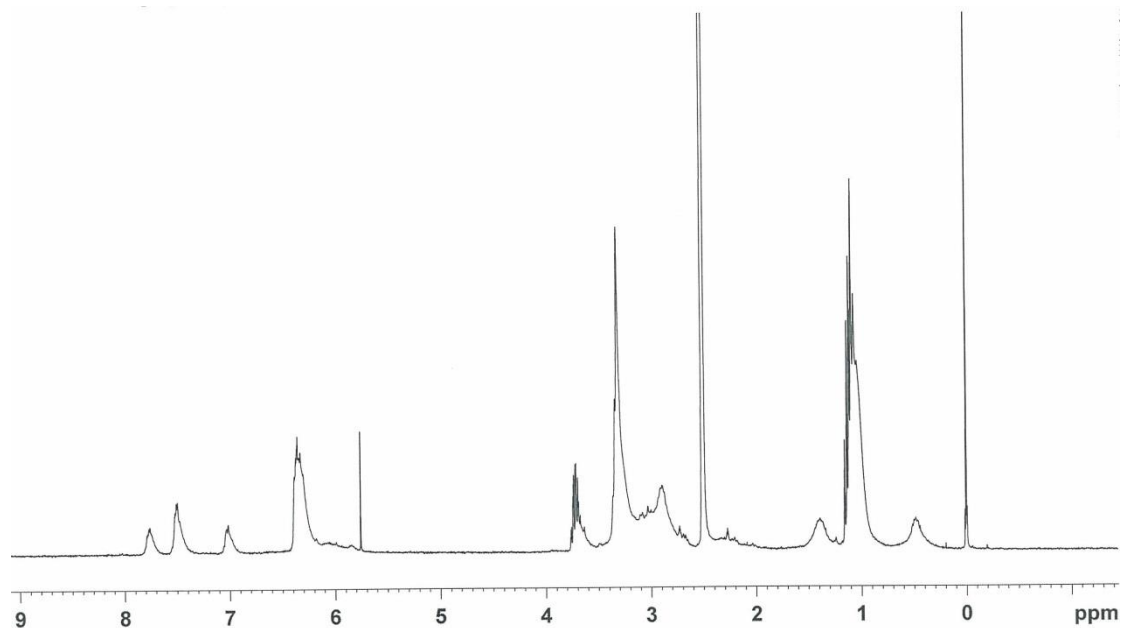


Fig. S8 ^1H -NMR spectra of RBSi.

References:

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