Electronic Supplementary Information (ESI)

Self-assembled Metallogels Formed From N, N′, N″-tris(4-pyridyl)-trimesic amide in Aqueous Solution Induced by Fe(III)/Fe(II) Ions

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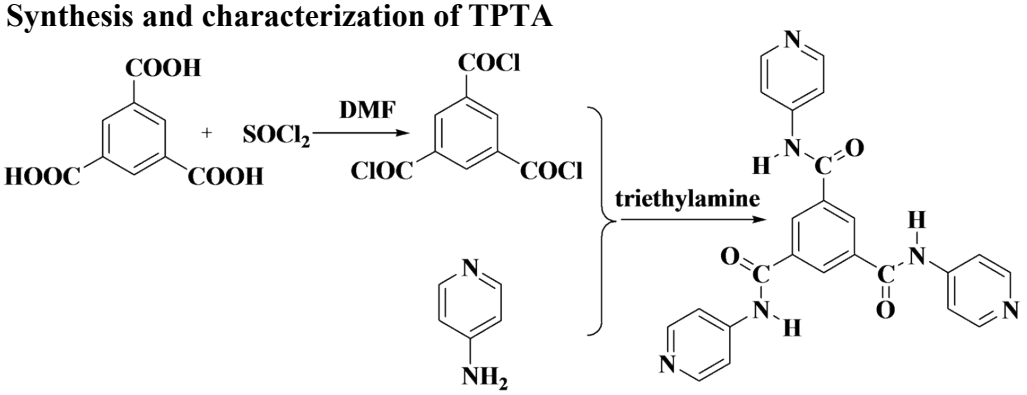
1) Synthesis and characterization of TPTA



Scheme S1 Synthetic routes of ligand TPTA.

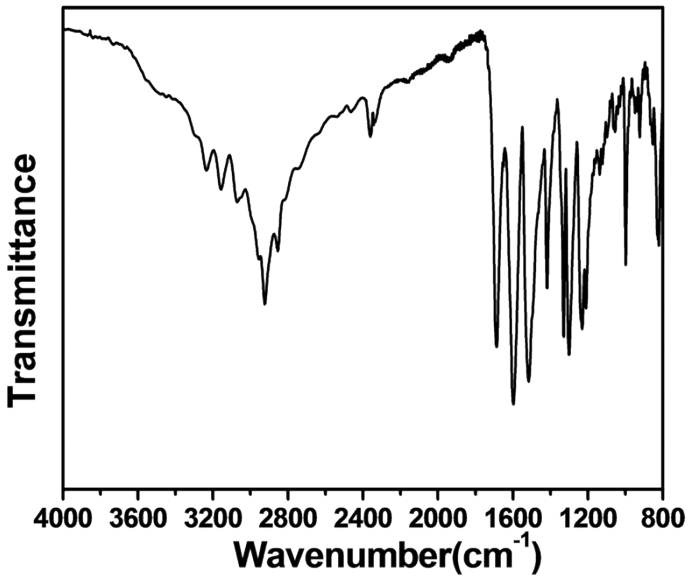


Fig. S1 FT-IR spectrum of the TPTA.

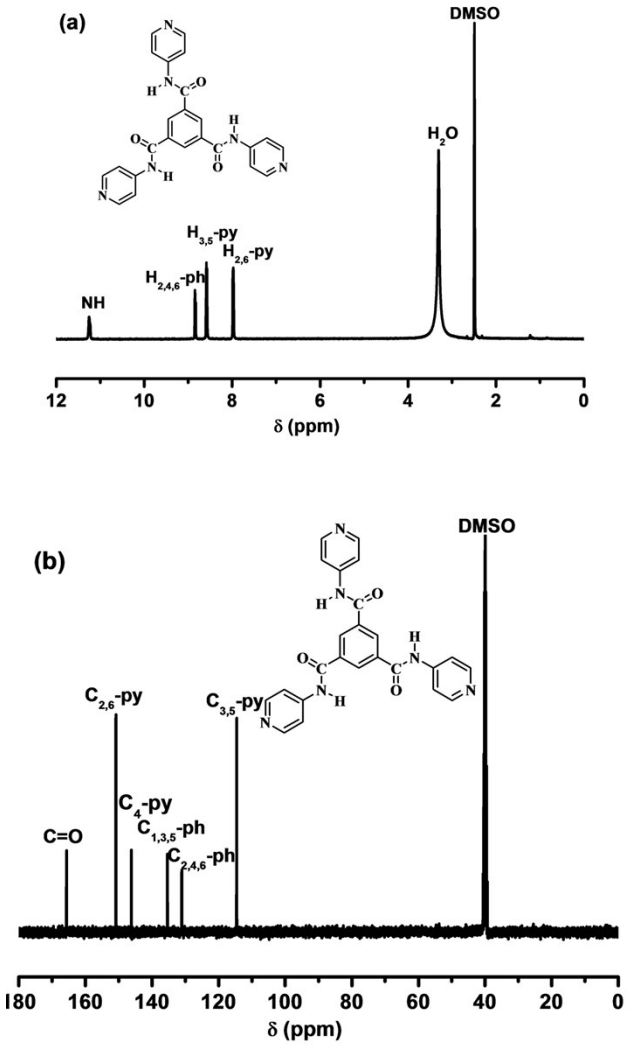


Fig. S2 ^{1}H NMR (a) and ^{13}C NMR (b) spectrums of TPTA (DMSO-d_6, 400MHz, 298K)

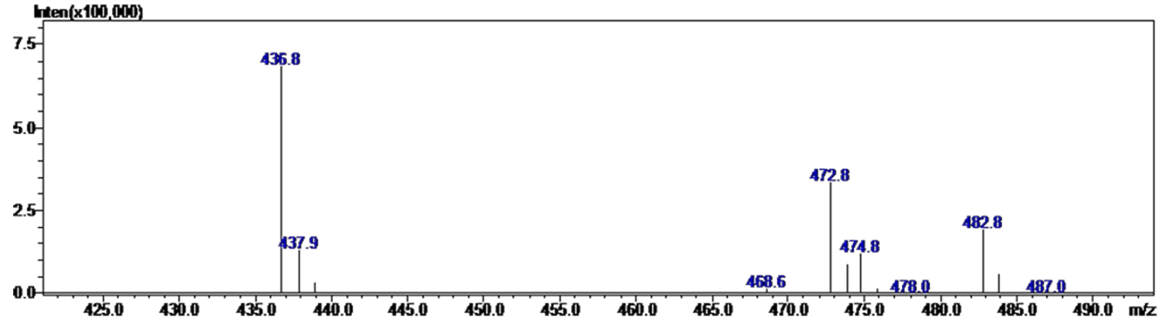


Fig. S3 Mass spectra of TPTA (LCMS-2010A, Shimadzu, 298 K)

2) Gelation data

Table S1 The gelation abilities of TPTA in the presence of different metal ions

Reagents		Behaviour
A	B	
TPTA	$CuSO_4 \cdot 5H_2O$	I
TPTA	$CuCl_2 \cdot 2H_2O$	I
TPTA	$CoCl_2 \cdot 6H_2O$	I
TPTA	$Ni(NO_3)_2 \cdot 6H_2O$	I
TPTA	$La(NO_3)_3 \cdot 6H_2O$	I
TPTA	$Ce(NO_3)_3 \cdot 6H_2O$	I
TPTA	$ZnCl_2$	I
TPTA	$Pb(NO_3)_2$	I
TPTA	$AgNO_3$	I
TPTA	$RuCl_3 \cdot 3H_2O$	I
TPTA	NaCl	I
TPTA	$MgCl_2$	I
TPTA	KCl	I
TPTA	$MnCl_2$	I
TPTA	$CrCl_2$	I
TPTA	$K_3[Fe(CN)_6]$	I
TPTA	$K_4[Fe(CN)_6]$	I
TPTA	$FeCl_3 \cdot 6H_2O$	OG
TPTA	$Fe_2(SO_4)_3 \cdot 9H_2O$	OG
TPTA	$Fe_2(NO_3)_3$	OG
TPTA	$FeCl_2 \cdot 4H_2O$	OG
TPTA	$Fe(NO_3)_2 \cdot 6H_2O$	OG
TPTA	$FeSO_4 \cdot 7H_2O$	OG

OG= opaque gel; I= insoluble

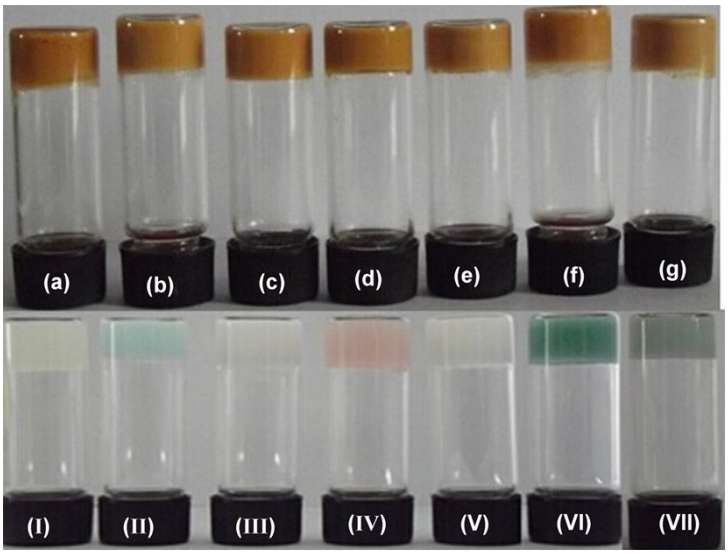


Fig. S4 The photographs of metallogels in mixed metal ion solution

(a)-(g), Fe^{3+}(0.10 mol/L)+M(0.10 mol/L): (a)M = Na^{+}; (b) M = Cu^{2+} ; (c) M = Mn^{2+} ; (d) M = Co^{2+} ; (e) M = K^{+} ; (f) M = Cr^{2+} ; (g) M = Na^{+}+K^{+}+Cu^{2+}+Co^{2+}

(I)-(VII), Fe^{2+}(0.01 mol/L)+M(0.01 mol/L): (I) M = Na^{+}; (II) M = Cu^{2+}; (III) M = Mn^{2+}; (IV) M = Co^{2+}; (V) M = K^{+}; (VI) M = Cr^{2+}; (VII) M =Na^{+}+ Cu^{2+}+ K^{+}

3) Date of differential scanning calorimetry (DSC)

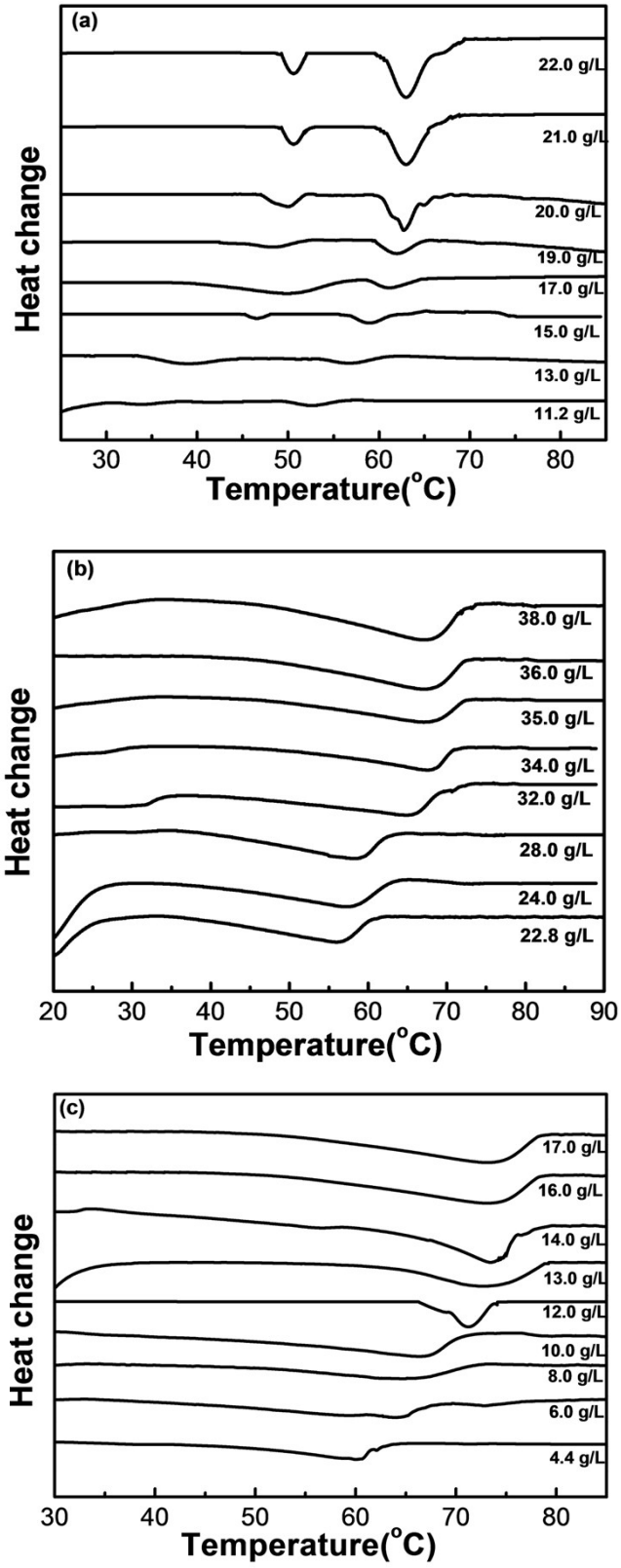


Fig S5 DSC thermograms from first heating of metallogels prepared by varying concentrations of TPTA in aqueous solution containing: (a) 0.050 mol/L Fe^{3+}; (b) 0.10 mol/L Fe^{3+}; (c) 0.010 mol/L Fe^{2+} .

4) Date of ^{1}H NMR spectroscopy

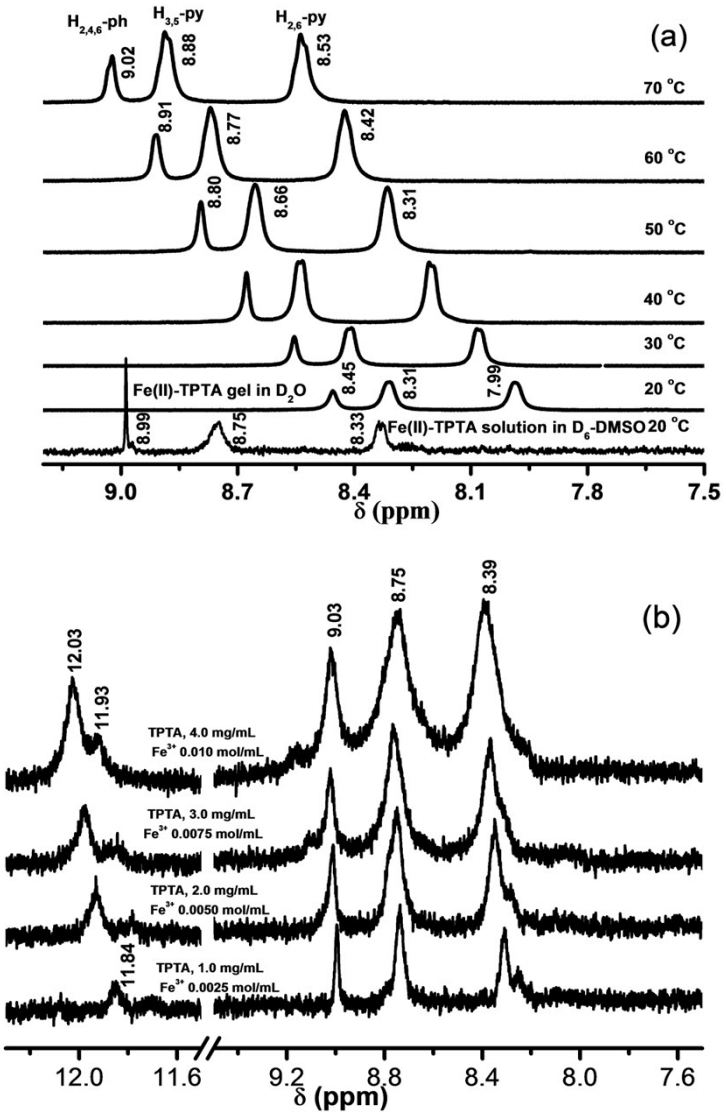


Fig. S6 (a) Variable-temperature ^{1}H NMR spectroscopy for Fe(II)-TPTA gel in D_2O (0.010 mol/L Fe^{2+}, 4.4 g/L TPTA); (b) Concentration-dependent ^{1}H NMR spectra of Fe(II)-TPTA in D_6-DMSO at 20 ^{o}C.

5) Date of UV-Vis spectra

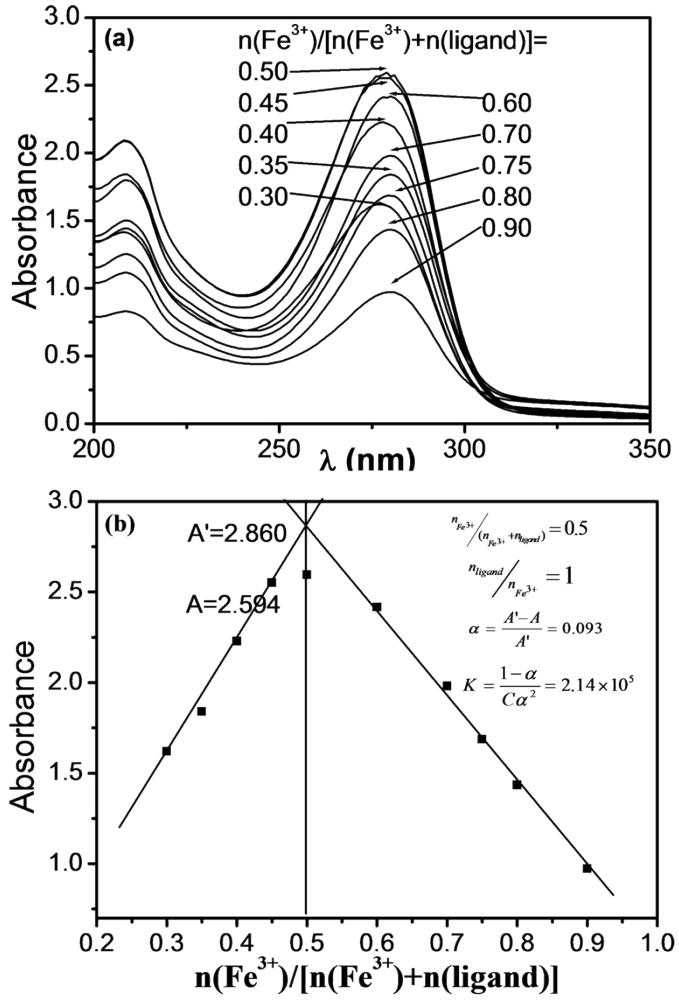


Fig. S7 (a) UV-Vis spectra of TPTA solution at various coordination molar ratio of Fe^{3+} to TPTA in aqueous solution; (b) the absorbance of TPTA at the λ=281 nm.

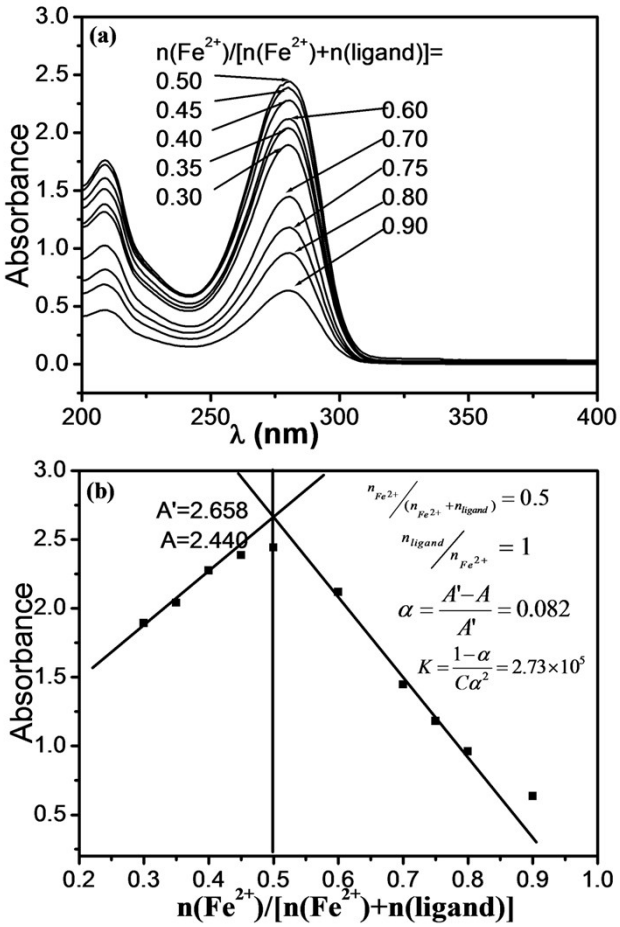


Fig. S8 (a) UV-Vis spectra of TPTA solution at various coordination molar ratio of Fe^{2+} to TPTA in aqueous solution; (b) the absorbance of TPTA at the λ=281 nm.

6) STM images of Fe(II)-TPTA assembling structure

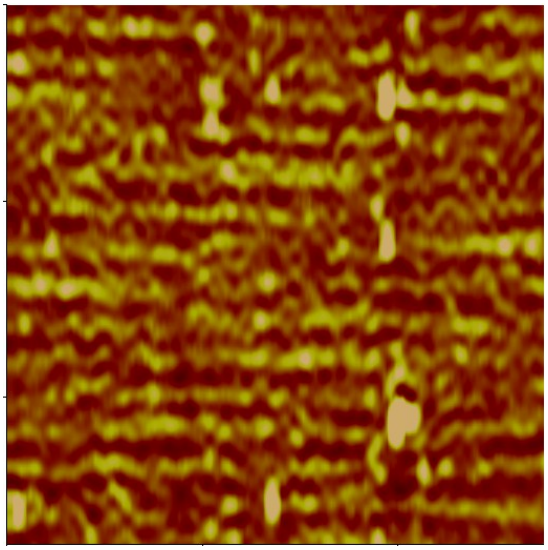


Fig. S9 STM image of Fe(II)-TPTA self-assembled structure (27.49 nm × 27.49 nm, V= 749.8 mV, I = 347.9 pA).