Electronic Supplementary Information

One-pot synthesis and assembly of melamine-based nanoparticles for microporous polymer organic frameworks and its application as a support for silver nanoparticles catalyst

Xiaolong Zhao,*[a] Na Yan[b]

Key Laboratory of Eco-Environment-Related Polymer Materials Ministry of Education; Key Laboratory of Polymer Materials of Gansu Province; College of Chemistry and Chemical Engineering, Northwest Normal University, 967 Anning East Road, Lanzhou, P. R. China 730070.

*To whom correspondence should be addressed. Email: zhaoxl82@nwnu.edu.cn

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1. Tables

Table S1

Yields of the melamined-based POFs.

Samples	Molar ratio[a]	Yield (%)
POF-MT_3	1:3	33
POF-M_2T_3	2:3	72
POF-M_3T_3	3:3	73
POF-M_4T_3	4:3	67
POF-M_5T_3	5:3	66
POF-MI_3	1:3	35
POF-M_2I_3	2:3	71
POF-M_3I_3	3:3	73
POF-M_4I_3	4:3	65
POF-M_5I_3	5:3	66

[a]Molar ratio of melamine (M) to terephthalaldehyde (T) or isophthalaldehyde (I).

Table S2

Chemical elemental analysis of the melamined-based POFs.

Samples	Molar ratio[a]	C (%)	H (%)	N (%)
POF-M_2T_3	2:3	37.18	4.62	39.78
POF-M_4T_3	4:3	36.07	4.56	40.33
POF-M_2I_3	2:3	35.97	4.58	39.14
POF-M_4I_3	4:3	34.46	4.88	42.19

[a]Molar ratio of melamine (M) to terephthalaldehyde (T) or isophthalaldehyde (I).

Table S3

The XRD data of POF-M_2T_3/AgNPs composites.

2θ	38.1	44.4	64.6	77.2
(hkl)[a]	111	200	220	311
calcd d_{hkl} [b]	0.2366	0.2040	0.1444	0.1232
d_{hkl} [c]	0.2359	0.2043	0.1445	0.1231
D (nm)[d]	5.9	7.4	9.3	10.1

[a]Cubic crystal lattice planes of AgNPs. [b]Calculated d-spacing (inter planar spacing in Å) of silver particles (λ=2dsinθ) present inside silica fibers. [c]International Centre for Diffraction Data obtained for silver from JCPDS files (No. 41-1402). [d]The particle size of AgNPs calculated from the Bragg's and Sherrer's equations.

2. Figures

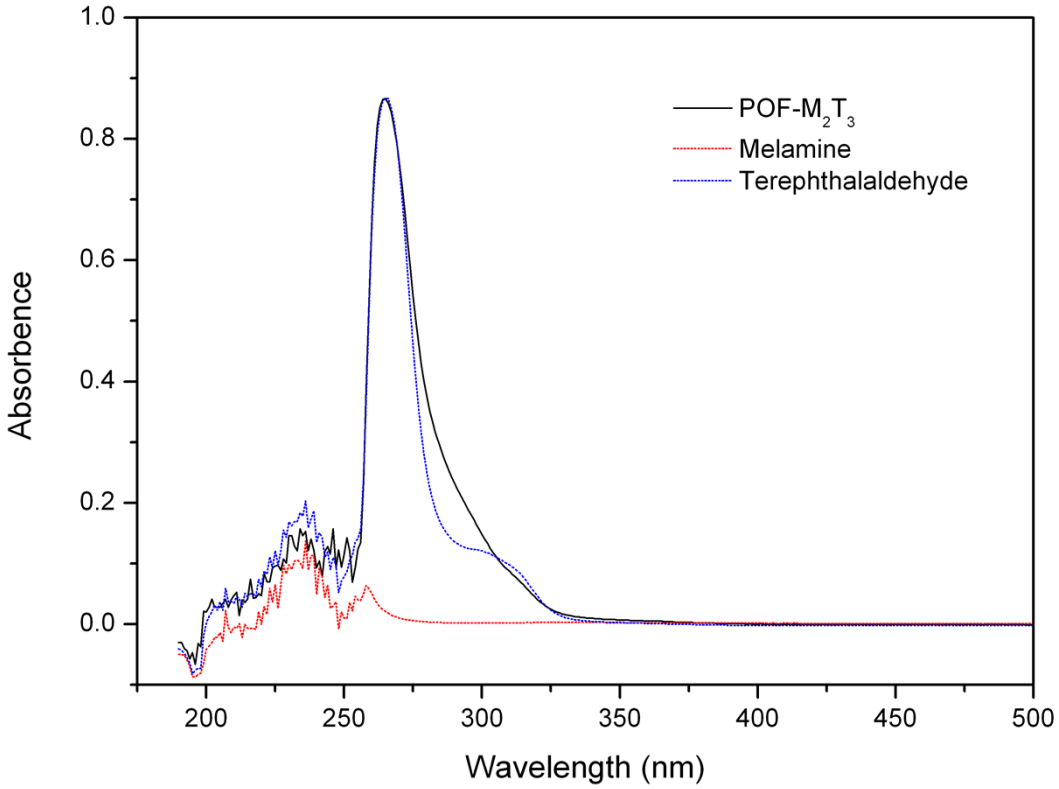

Fig. S1. UV-Vis spectra (DMSO as the reference) of melamine, terephthalaldehyde and POF-M_2T_3 with the reaction time of 2 h.

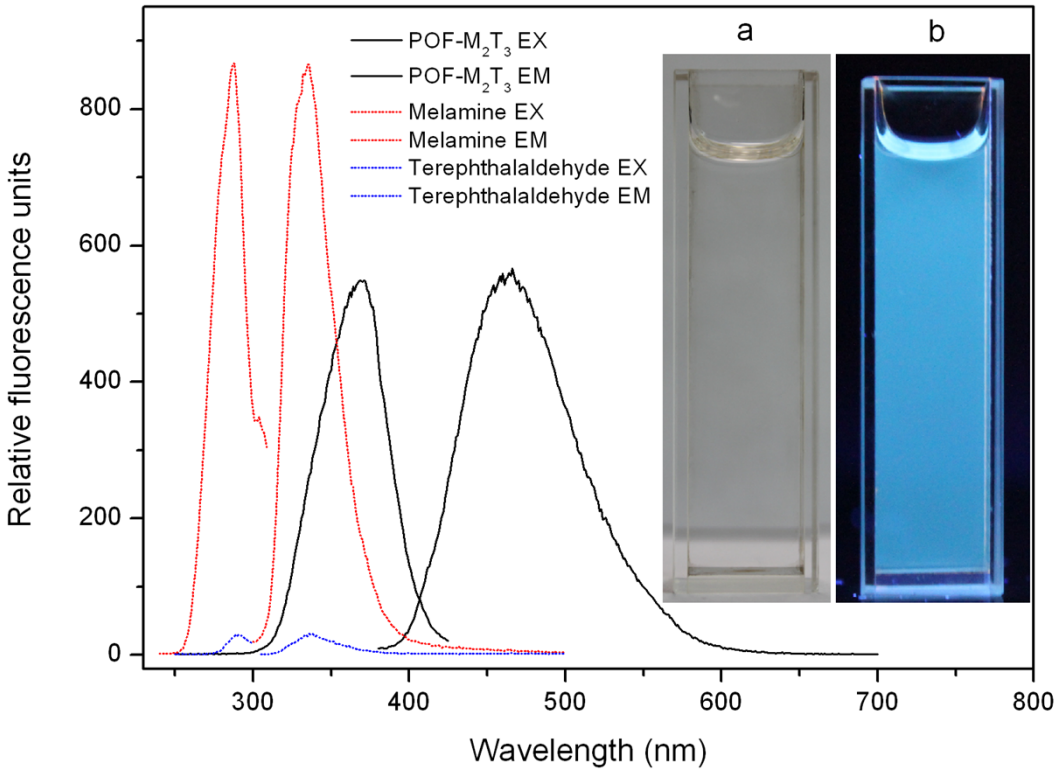

Fig. S2. Fluorescence excitation and emission spectra of melamine, terephthalaldehyde and POF-M_2T_3 with the reaction time of 2 h. Insets show the images of POF-M_2T_3 solution under natural (a) and ultraviolet (λ_{ex}=365 nm, b) light.

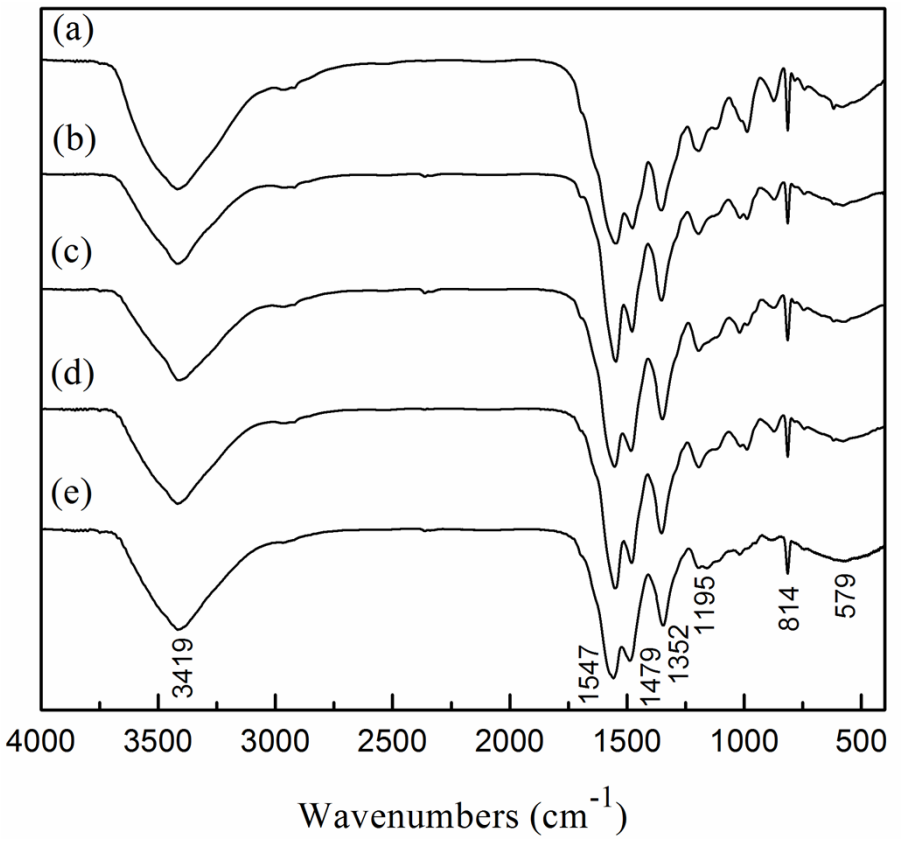

Fig. S3. FTIR spectra of the melamine-based POFs prepared with different M/T ratios.

(a) 1:3, (b) 2:3, (c) 3:3, (d) 4:3, (e) 5:3.

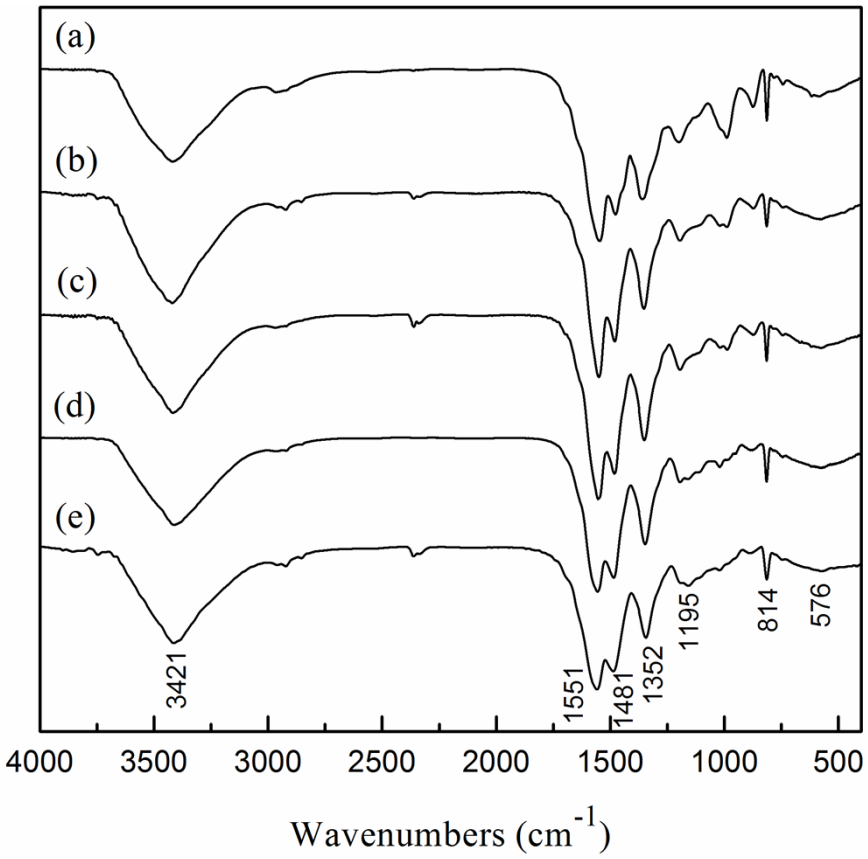

Fig. S4. FTIR spectra of the melamine-based POFs prepared with different M/I ratios.

(a) 1:3, (b) 2:3, (c) 3:3, (d) 4:3, (e) 5:3.

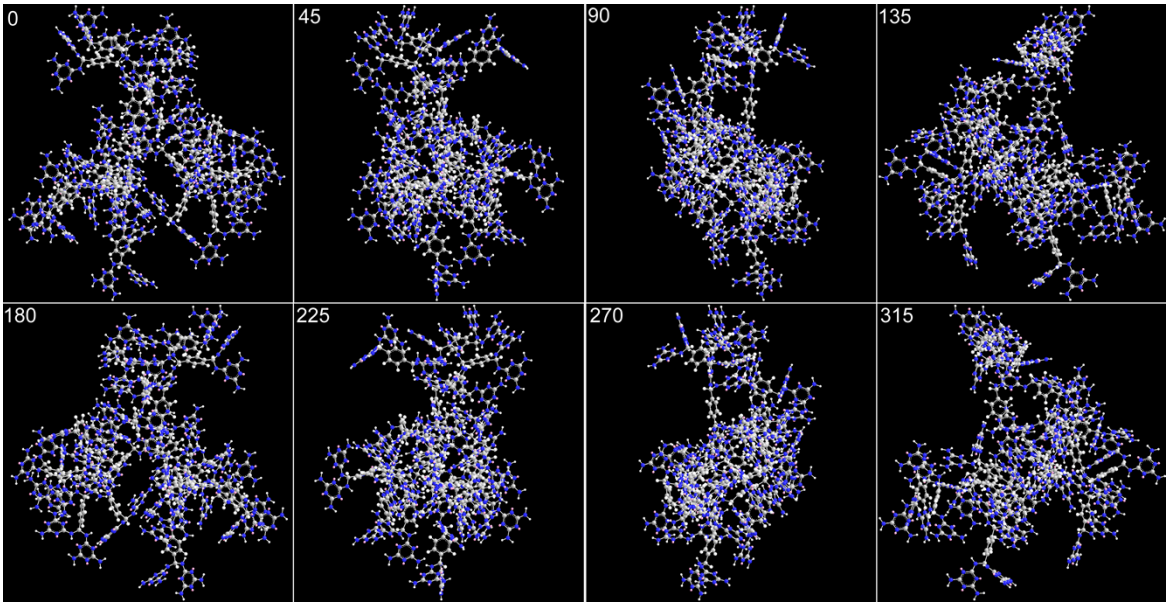

Fig. S5. Rotating 3D structure model for POF-M_2T_3 (Numbers at upper left are angles of rotation).

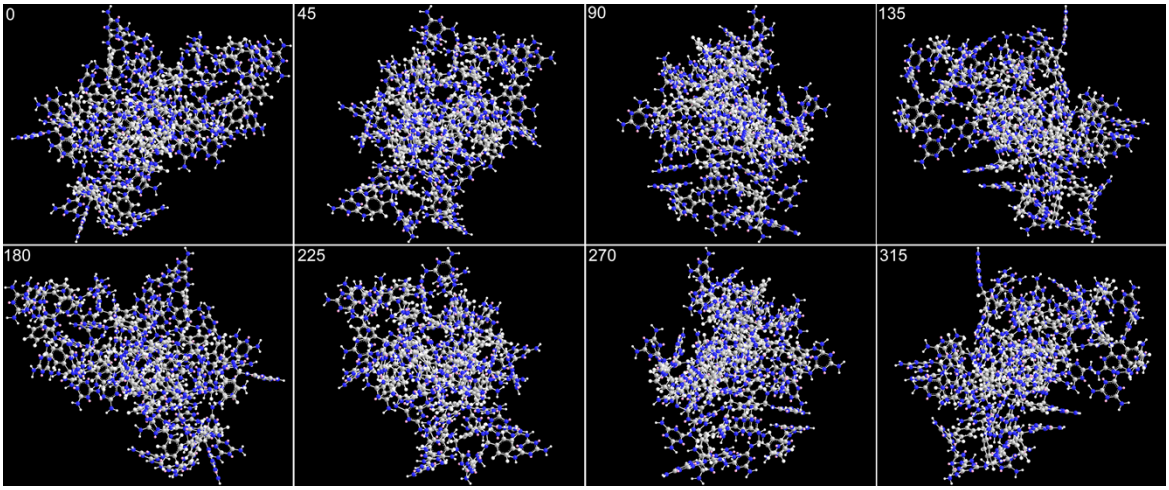

Fig. S6. Rotating 3D structure model for POF-M_2I_3 (Numbers at upper left are angles of rotation).

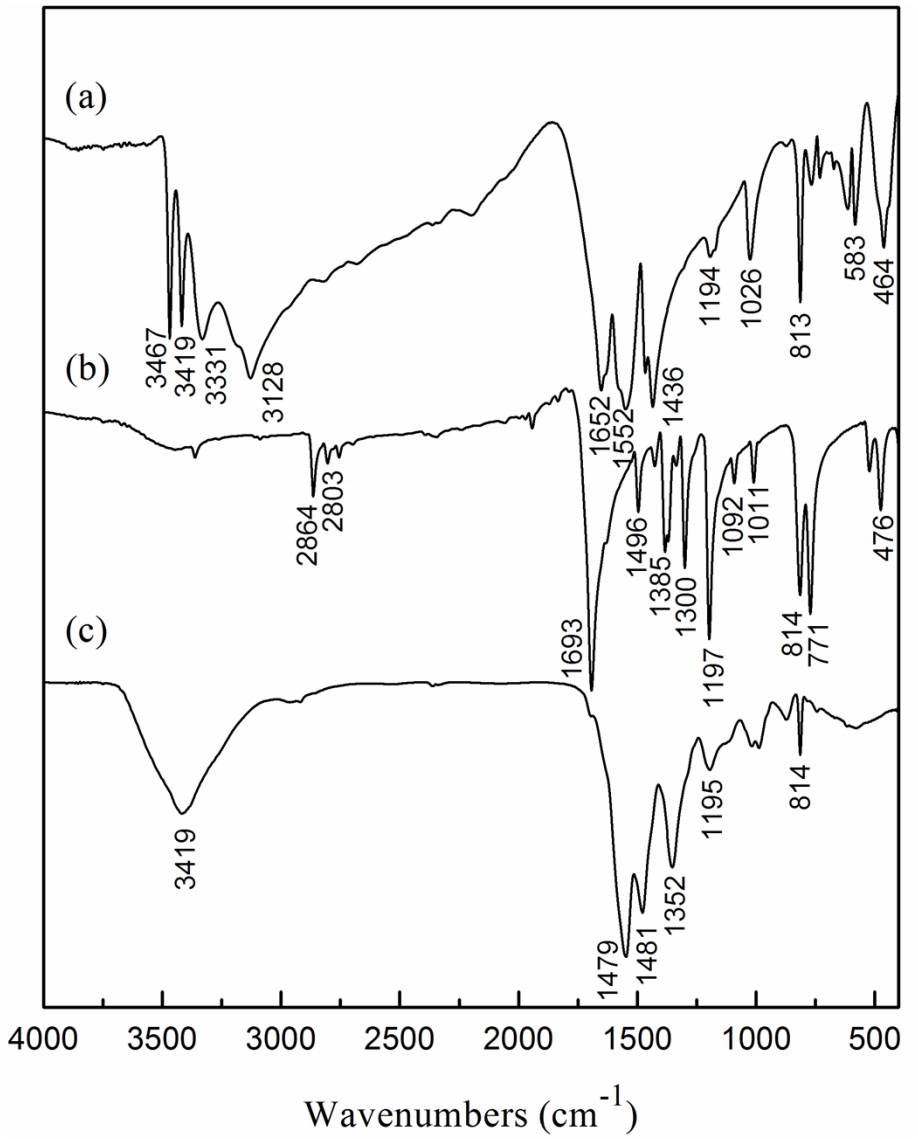

Fig. S7. FTIR spectra of melamine (a), terephthalaldehyde (b) and POF-M_2T_3 (c).

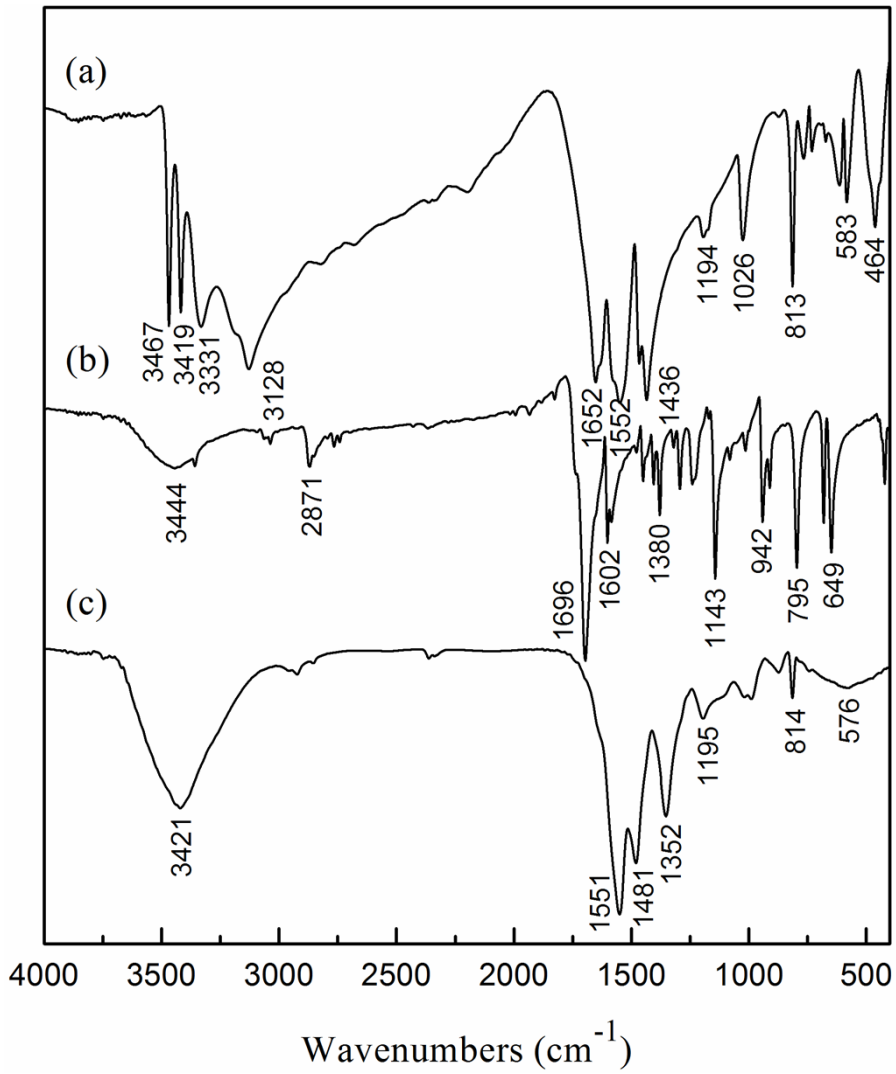

Fig. S8. FTIR spectra of melamine (a), isophthalaldehyde (b) and POF-M_2I_3 (c).

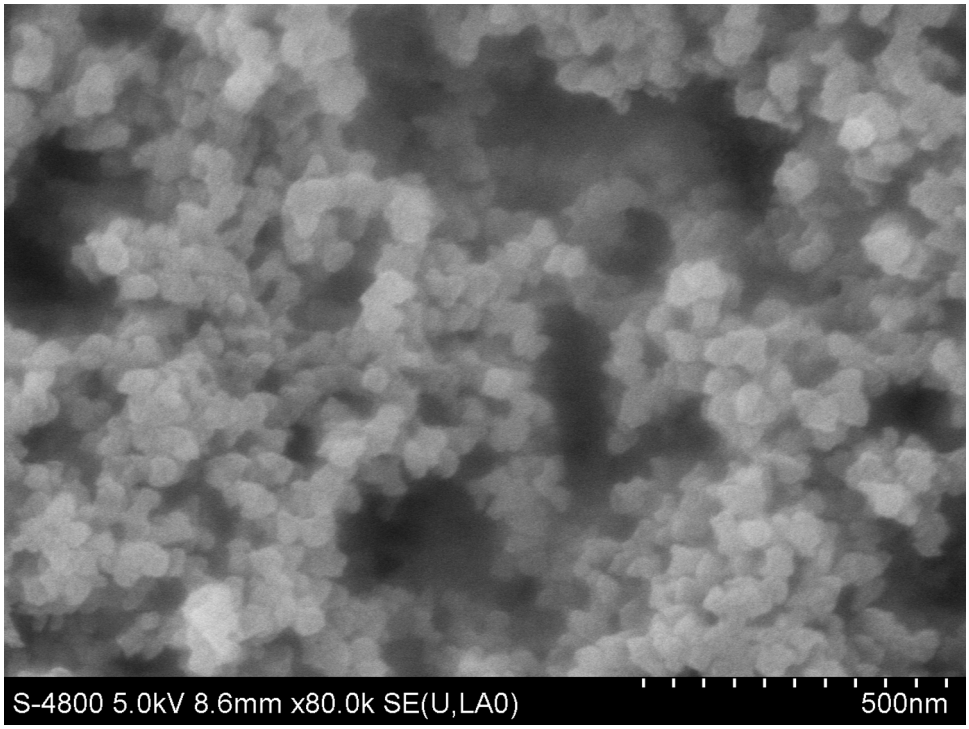

Fig. S9. SEM image of POF-M_4T_3.

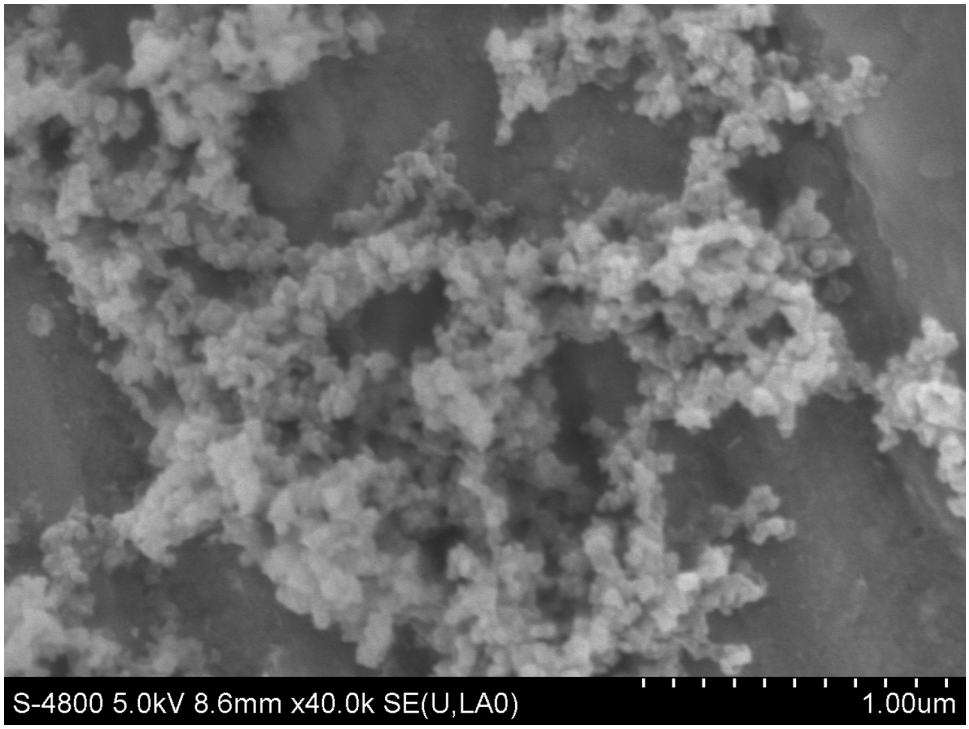

Fig. S10. SEM image of POF-M_4I_3.

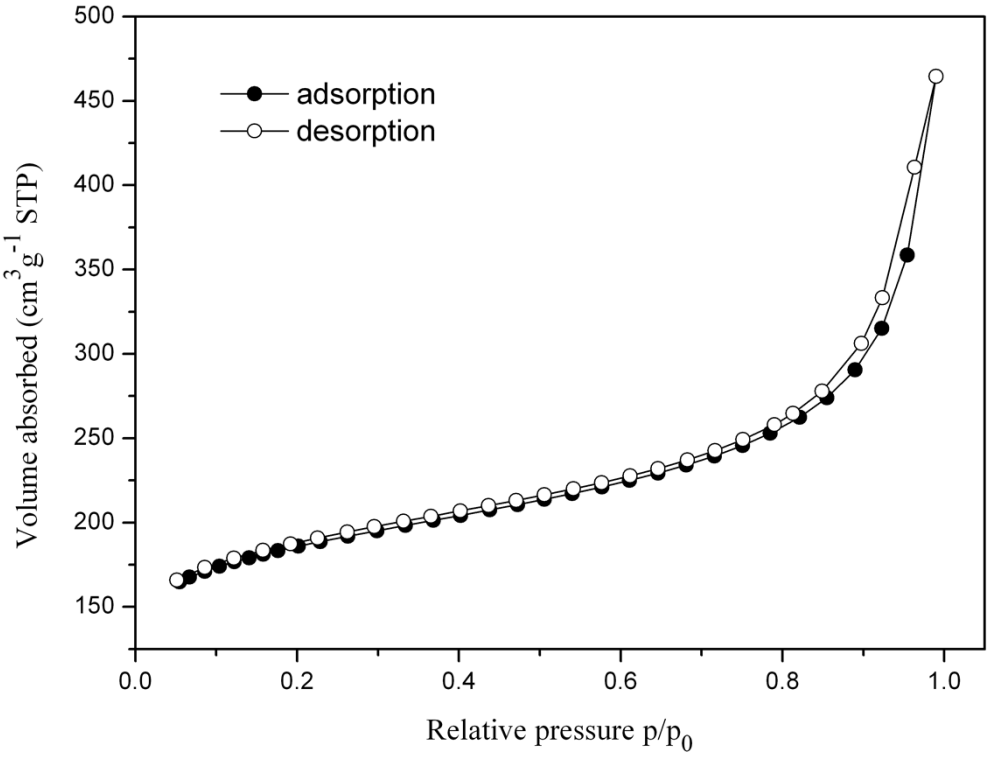

Fig. S11. Nitrogen adsorption and desorption isotherm of POF-M_4T_3.

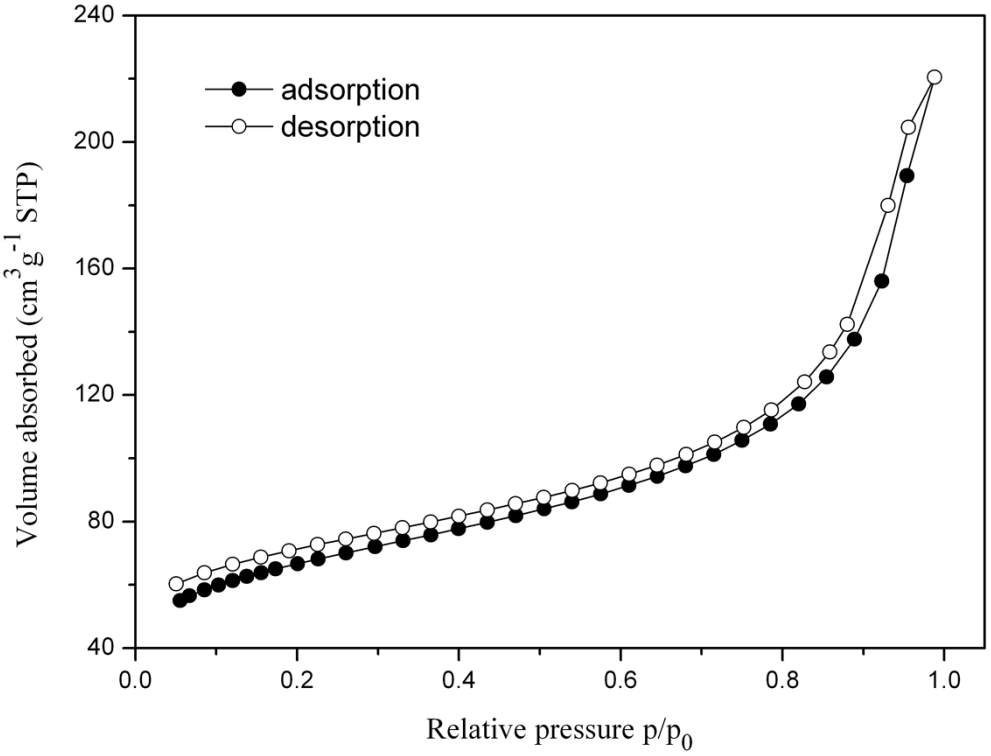

Fig. S12. Nitrogen adsorption and desorption isotherm of POF-M_4I_3.

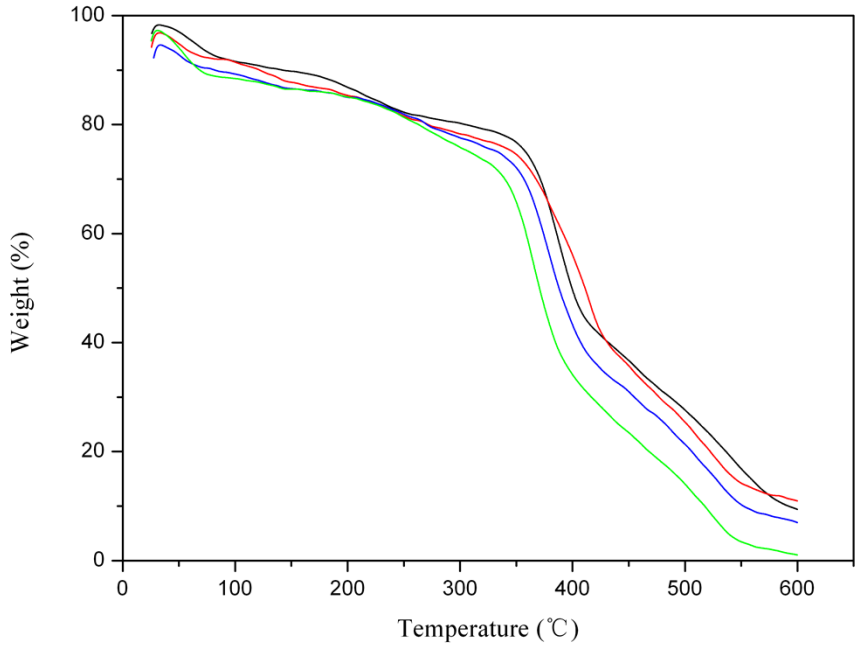

Fig. S13. Thermogravimetric analysis of POF-M_2T_3 (black), POF-M_4T_3 (red), POF-M_2I_3 (blue) and POF-M_4I_3 (green).

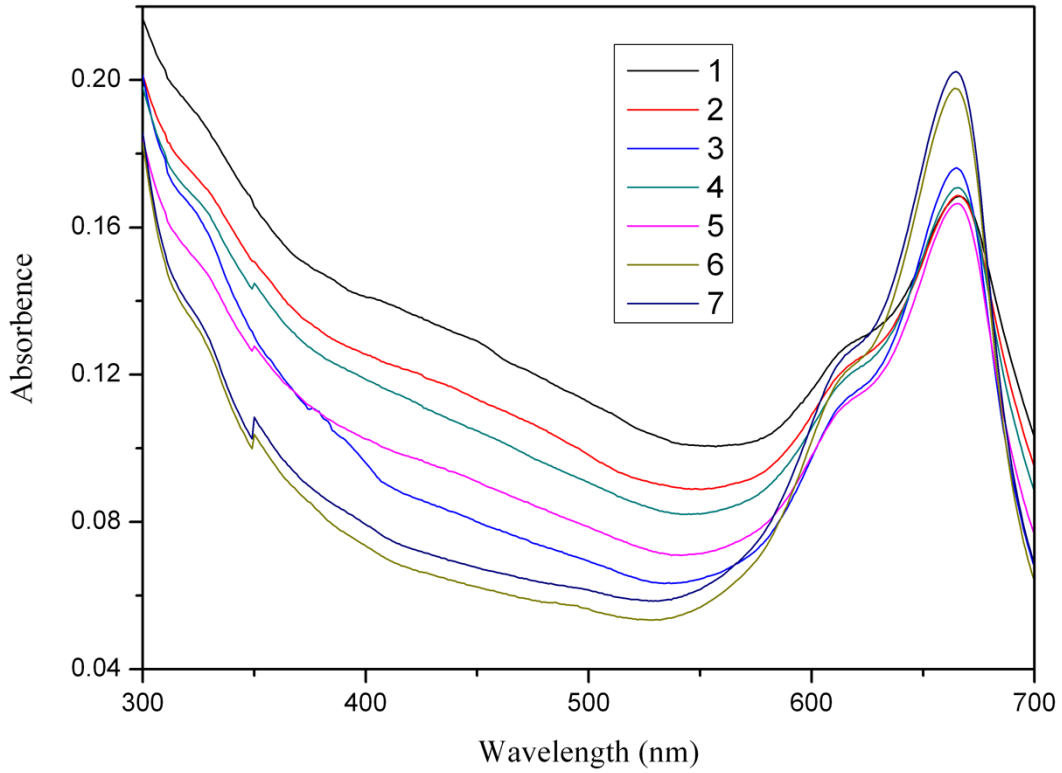

Fig. S14. Successive UV-vis absorption spectra of the reduction of methylene blue by $NaBH_4$ using recycled POF-M_2T_3/AgNPs composites as catalyst (after 20 min). The same batch of POF-M_2T_3/AgNPs composites were used for 7 times, and in each cycle, the POF-M_2T_3/AgNPs composites were directly used after a simple centrifugation and washing with distilled water.