Electronic Supplementary Material (ESI) for RSC Advances. This journal is © The Royal Society of Chemistry 2018

Supporting Information

One-pot synthesis of enhanced fluorescent copper nanoclusters encapsulated in metalorganic frameworks

Bingyan Han, Xixi Hu, Mingbo Yu, Tingting Peng, Ying Li, Gaohong He*

State Key Laboratory of Fine Chemicals, School of Petroleum and ChemicalEngineering, Dalian University of Technology, Panjin, Liaoning 124221, China.E-mail: hgaohong@dlut.edu.cn; Tel: + 86427-2631809



Fig. S1 The photos of Cu NCs@GSH/MOFs (a) with Zn^{2+} , (b) in the presence of half amount of Zn^{2+} and (c) without Zn^{2+} .

Without one component	Results	Reasons
Zn ²⁺	There is a little fluorescence emission and no precipitate is generated.	The MOF-5 can not grow perfectly without Zn ²⁺ . As a result, the Cu NCs@GSH can not be encapsulated in MOF-5 to improve the fluorescence intensity and stability.
H ₂ BDC	There is no fluorescence emission. And the solution changes to turbid but no precipitate is generated.	The MOF-5 can not grow perfectly without H ₂ BDC.
DMF	There is no fluorescence emission.	The H ₂ BDC can not completely be dissolved only in the presence of water

Table S1. The role of each component on the formation of Cu NCs@GSH/MOFs.

		without DMF so the MOF-5 can not be
		synthesized .
Cu ²⁺	There is no fluorescence emission. And just a little precipitate is generated.	Cu NCs@GSH can not be synthesized without Cu ²⁺ . We speculate that of Cu NCs@GSH and MOF-5 is synergistic grow, so there is a little precipitate without Cu ²⁺
GSH	There is no fluorescence emission.	Cu NCs@GSH can not be synthesized
		without the protecting agent GSH.
Water	There are a little fluorescence emission	Water is more suitable for the synthesis
	and a few impurities.	of Cu NCs@GSH. As shown in Fig 2.



Fig S2. Photos of the role of each component on the formation of Cu NCs@GSH/MOFs under (a) daylight and (b) UV light.



Fig. S3 The difference of fluorescence intensity with and without water.



Fig. S4 The EDS elemental analysis of Cu NCs@GSH/MOF-5.



Fig. S5 TEM image of Cu NCs@GSH/MOF-5



Fig. S6 SEM image of Cu NCs@GSH/MOF-5 composites with the addition of 1 M



Fig. S7 (a) UV-vis and fluorescence spectrum of Ag NCs@GSH/MOF-5 composites (λ_{ex} =380 nm, λ_{em} =539 nm) and inset showed the photograph of Ag NCs@GSH/MOF-5 composites under the 365 nm UV light. (b) XPS spectrum of Ag 3d and (c) SEM image of Ag NCs@GSH/MOF-5 composites. (d) XRD spectra of MOF-5 and Ag NCs@GSH/MOF-5 composites.