

## Supporting Information

### **Growth of Cu-BTC MOFs on dendrimer-like porous silica nanospheres for catalytic aerobic epoxidation of olefins**

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**Table S1.** Experimental parameters of synthesis of the DPSNs@Cu<sub>2</sub>O and their properties.

Sample	<i>L</i> -Ascorbic acid (mg)	0.01 M Cu(NO <sub>3</sub> ) <sub>2</sub> solution (mL)	NH <sub>3</sub> ·H <sub>2</sub> O (μL)	Weight percentage of Cu <sub>2</sub> O calculated by weighing (wt.%) <sup>a</sup>	Particle size of Cu <sub>2</sub> O (nm)
DPSNs@Cu <sub>2</sub> O-1	17.5	12.5	15	5±2	10±5
DPSNs@Cu <sub>2</sub> O-2	35	25	30	10±5	20±8
DPSNs@Cu <sub>2</sub> O-3	70	50	60	20±5	30±9
DPSNs@Cu <sub>2</sub> O-4	210	150	240	60±15	45±13

[a] The value is obtained by weighing the mass change of the sample before and after the preparation process.

**Table S2.** Experimental parameters of synthesis of the DPSNs@Cu-BTC and their properties.

Sample	Precursor	Weight percentage of the copper element via ICP-AES (wt.%)	Weight percentage of Cu-BTC calculated by ICP-AES (wt.%) <sup>a</sup>	Weight percentage of Cu-BTC calculated by weighing (wt.%) <sup>b</sup>	Particle size of Cu-BTC (nm)
DPSNs@Cu-BTC-1	DPSNs@Cu <sub>2</sub> O-1	1.38	6.57	5±2	20±5~50±10
DPSNs@Cu-BTC-2	DPSNs@Cu <sub>2</sub> O-2	4.00	17.33	17±5	20±5~50±10
DPSNs@Cu-BTC-3	DPSNs@Cu <sub>2</sub> O-3	9.24	33.87	40±5	20±5~50±10
DPSNs@Cu-BTC-4	DPSNs@Cu <sub>2</sub> O-4	30.95	69.28	72±15	40±10~90±18

[a] Calculate the molar amount of copper through ICP-AES datas, and thus calculate the actual value of weight and percentage of Cu-BTC. Cu-BTC= C<sub>18</sub>H<sub>12</sub>O<sub>15</sub>Cu<sub>3</sub> [1]

[b] The value is obtained by weighing the mass change of the sample before and after the preparation process.

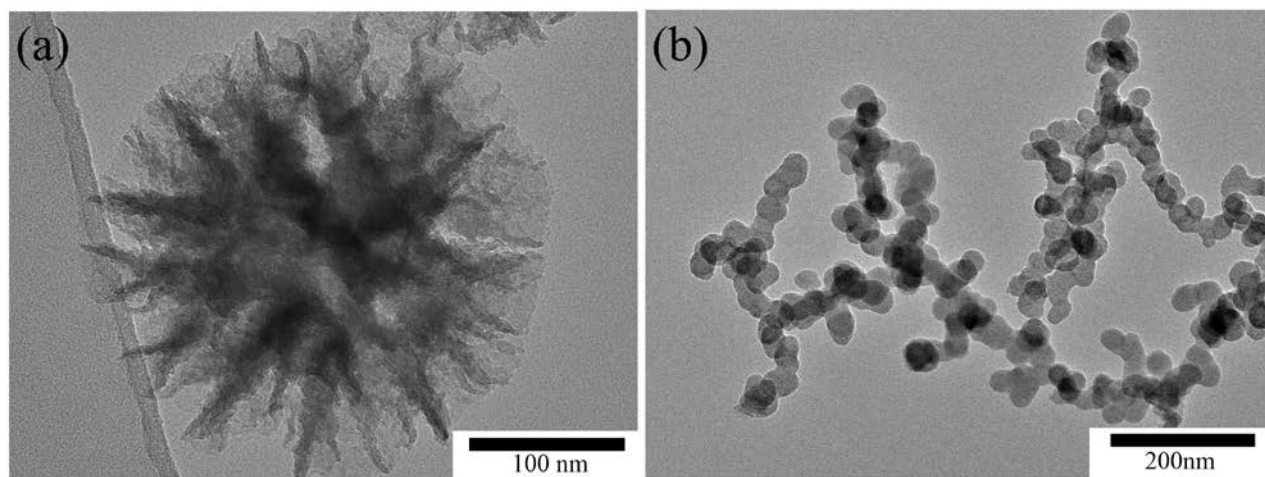


Fig. S1. TEM images of DPSN (a) and Cu<sub>2</sub>O (b).

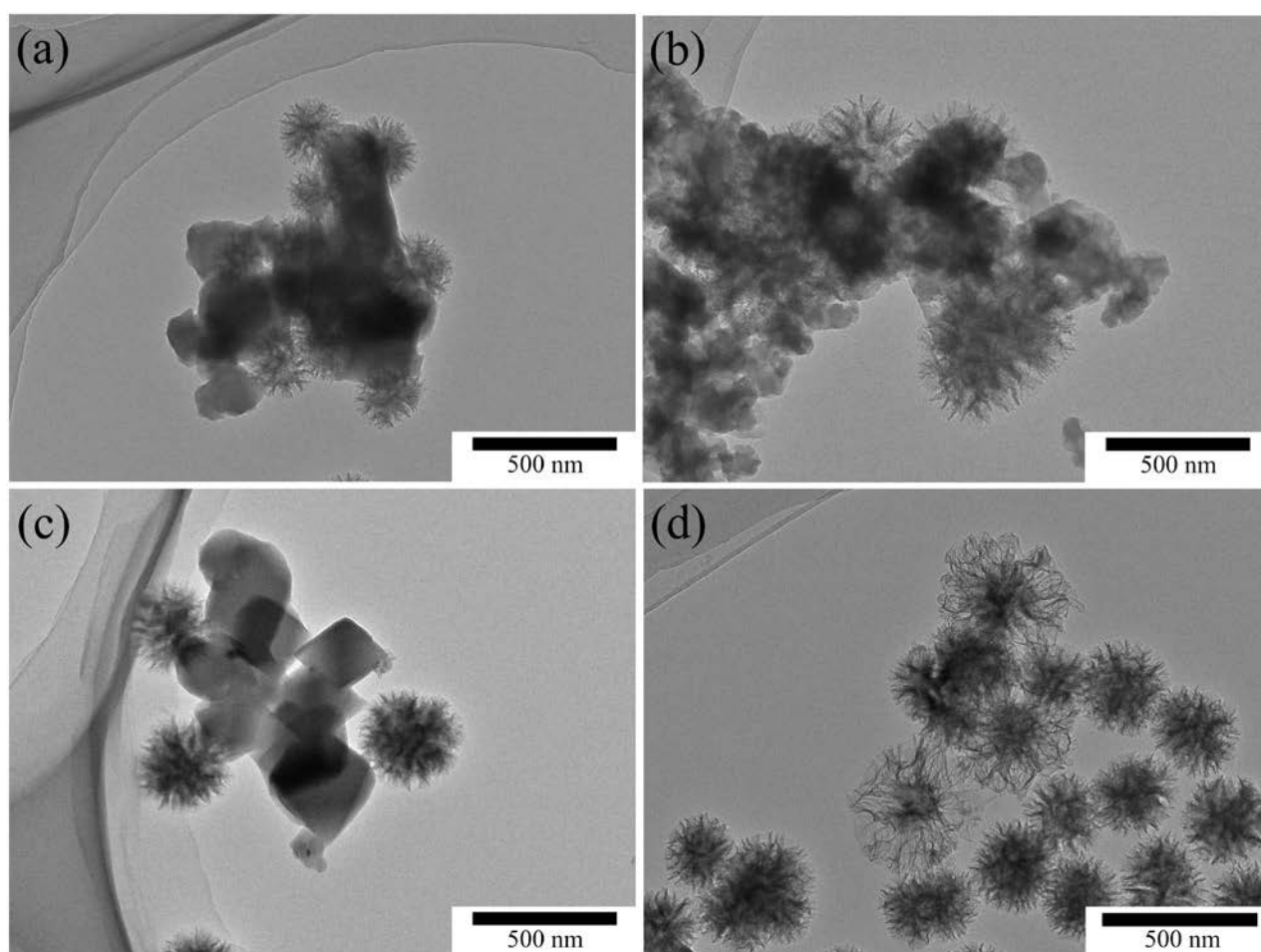


Fig. S2. TEM images of DPSN@Cu-BTC through different synthesis methods: (a) Hydrothermal synthesis, (b) Ultrasonic synthesis, (c) Ethanol reflux method, (d) Layer by layer coating.

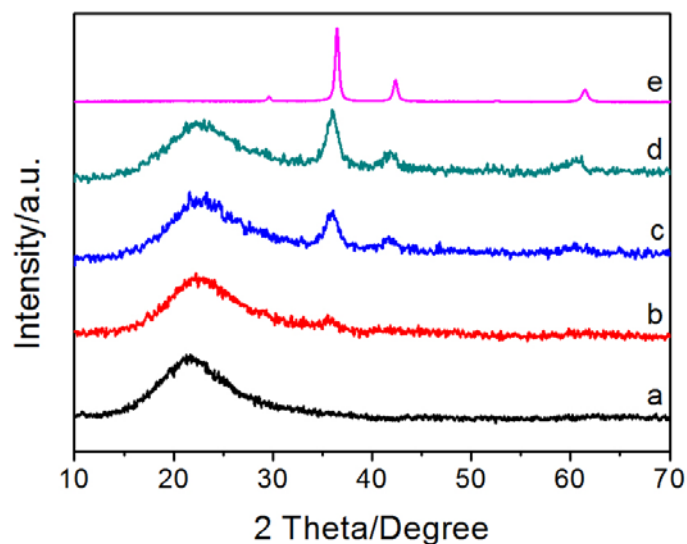


Fig. S3. X-ray diffraction patterns of DPSNs@Cu<sub>2</sub>O: (a) DPSNs, (b) DPSNs@Cu<sub>2</sub>O-1, (c) DPSNs@Cu<sub>2</sub>O-2, (d) DPSNs@Cu<sub>2</sub>O -3 and (e) Cu<sub>2</sub>O.

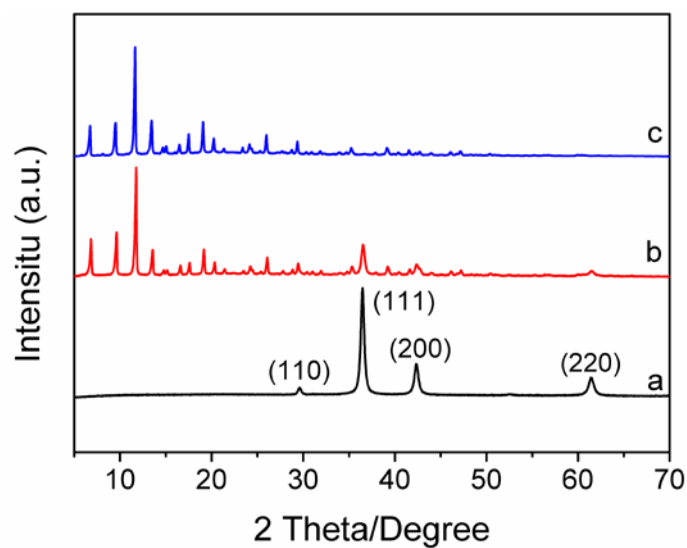


Fig. S4. X-ray diffraction patterns of Cu-BTC: (a) Cu<sub>2</sub>O, (b) Cu-BTC prepared from Cu<sub>2</sub>O NPs, (c) Cu-BTC prepared by hydrothermal method.

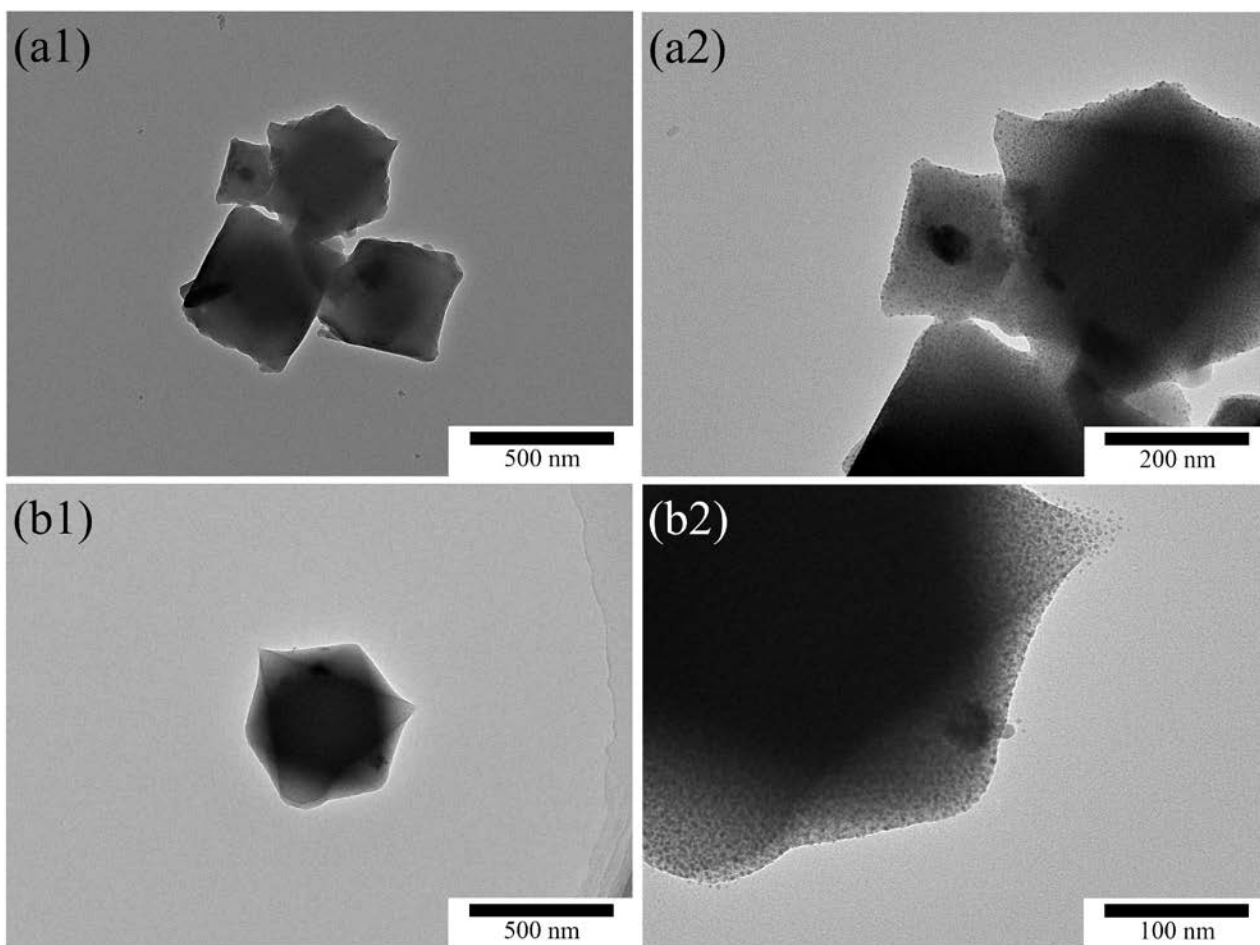


Fig. S5. TEM images of Cu-BTC prepared from  $\text{Cu}_2\text{O}$  NPs.

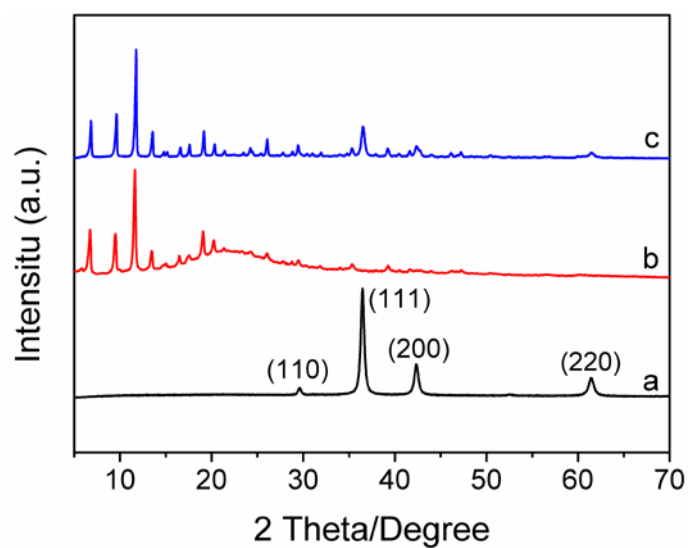


Fig. S6. X-ray diffraction patterns of DPSNs@Cu-BTC: (a)  $\text{Cu}_2\text{O}$ , (b) DPSNs@Cu-BTC prepared from DPSNs@ $\text{Cu}_2\text{O}$ -70 wt%, (c) Cu-BTC prepared from  $\text{Cu}_2\text{O}$  NPs.

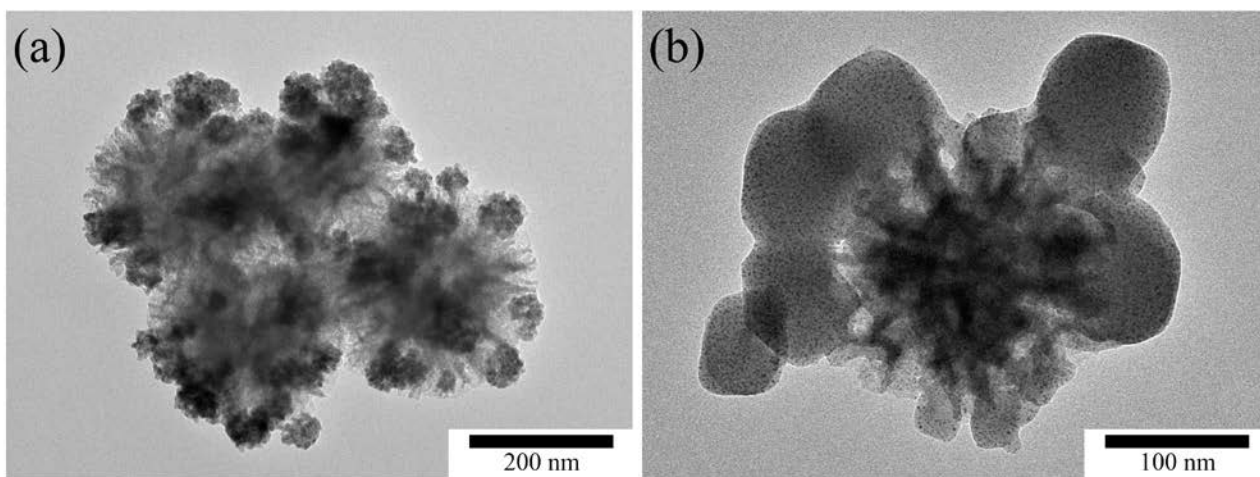


Fig. S7. TEM images of DPSNs@Cu<sub>2</sub>O-4 (a) and DPSNs@Cu-BTC-4 (b).

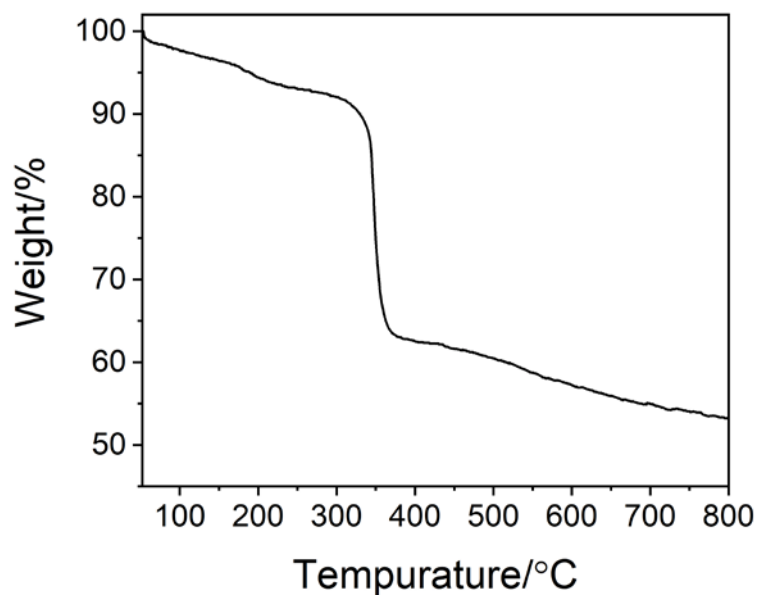


Fig. S8. TGA diagrams of Cu-BTC prepared from Cu<sub>2</sub>O NPs.

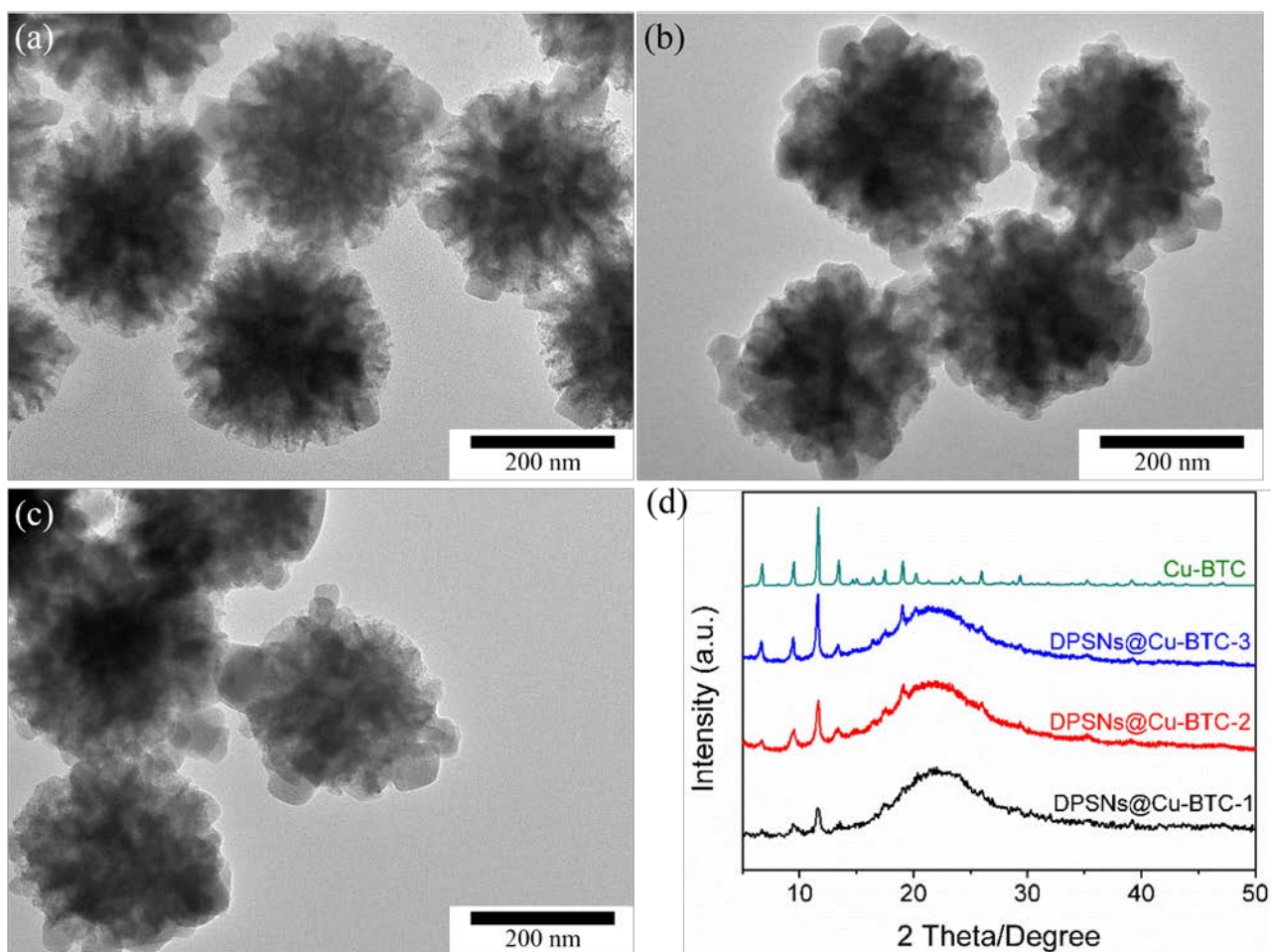


Fig. S9. TEM images of DPSNs@Cu-BTC after ten cycles: (a) DPSNs@Cu-BTC-1, (b) DPSNs@Cu-BTC-2, (c) DPSNs@Cu-BTC-3; (d) X-ray diffraction patterns of DPSNs@Cu-BTC after ten cycles.

## References

- [1] S. S.Y. Chui, S. M. F. Lo, J. P. H. Charmant, A. G. Orpen, I. D. Williams, A Chemically Functionalizable Nanoporous Material  $[\text{Cu}_3(\text{TMA})_2(\text{H}_2\text{O})_3]_n$ , *Science* 283 (1999) 1148–1150.