

Electronic Supplementary Information

Mussel-Inspired Polydopamine Chemistry to Modulate Template Synthesis of 1D Metal-Organic Framework Superstructures

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Supporting Figures

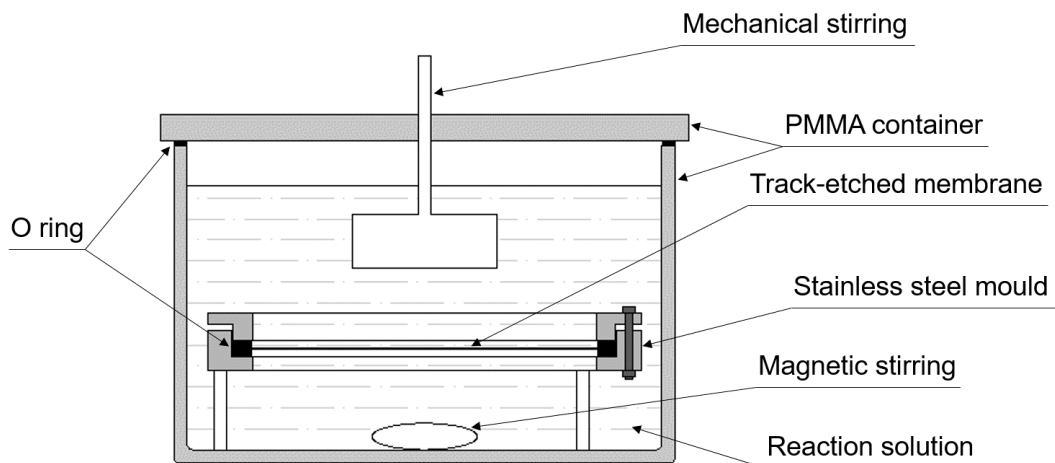


Fig. S1. Schematic diagram of the PDA modification unit.



Fig. S2. Photograph of the contra-diffusion reaction setup for template synthesis of MOFs

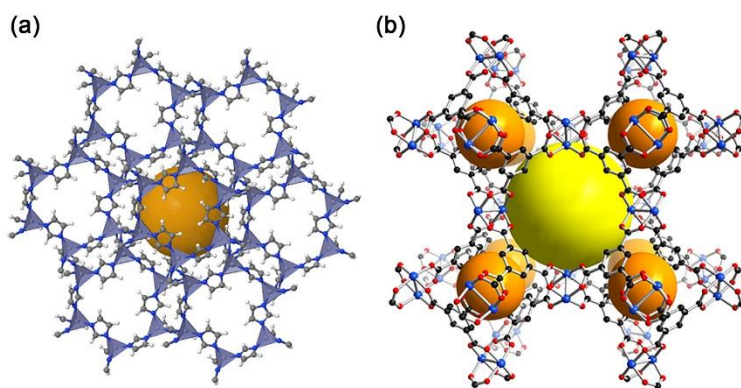


Fig. S3. Coordination structure of (a) ZIF-8 and (b) HKUST-1. CIF files were obtained via the Crystallography Open Database.

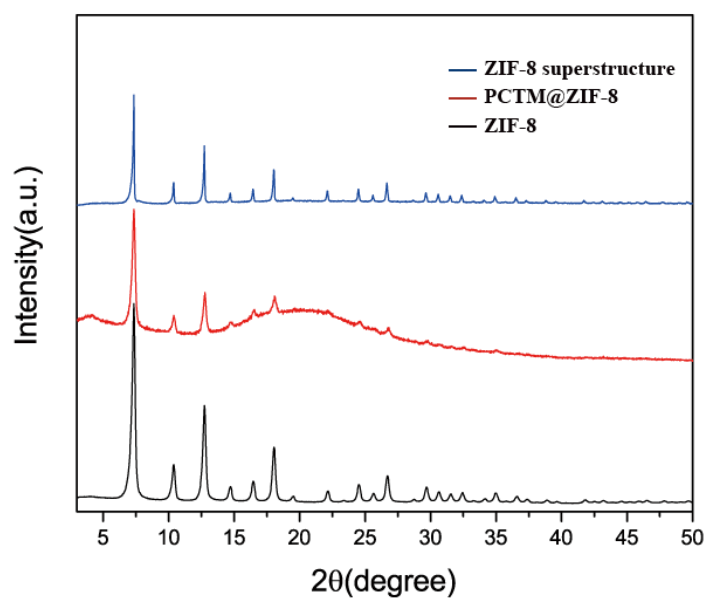


Fig. S4. XRD patterns of conventional ZIF-8 crystal (black), ZIF-8 deposited PCTM (red) and isolated 1D ZIF-8 superstructures (blue).

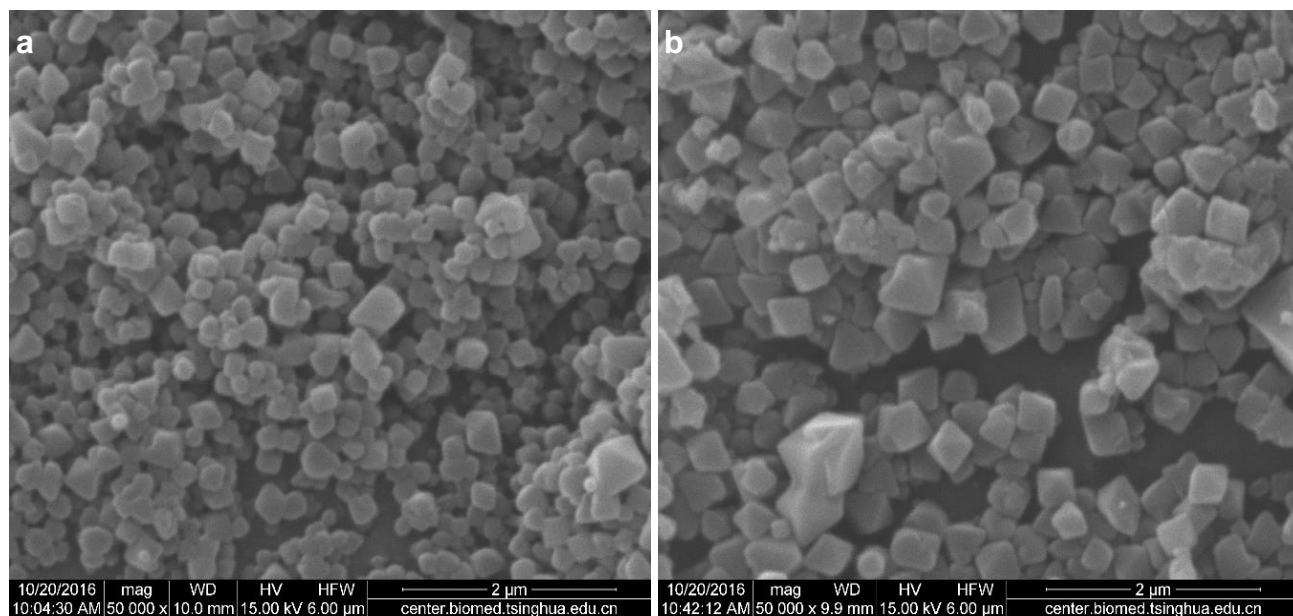


Fig. S5. SEM images of (a) ZIF-8 and (b) HKUST-1 crystals by solution synthesis under the experimental conditions. An average size of 100 nm and 350 nm was estimated for ZIF-8 and HKUST-1 crystals, respectively.

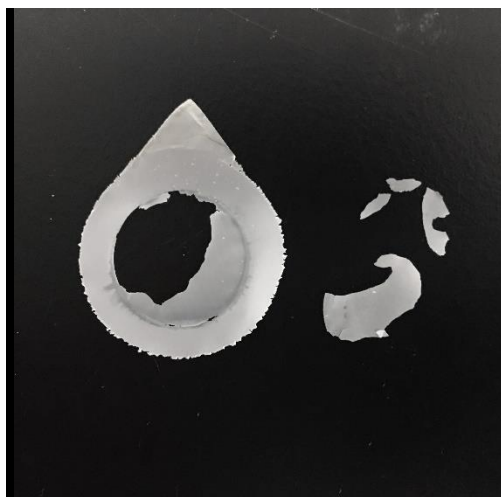


Fig. S6. Photograph of fractured ZIF-8 composite membrane after 6 h contra-diffusion synthesis.

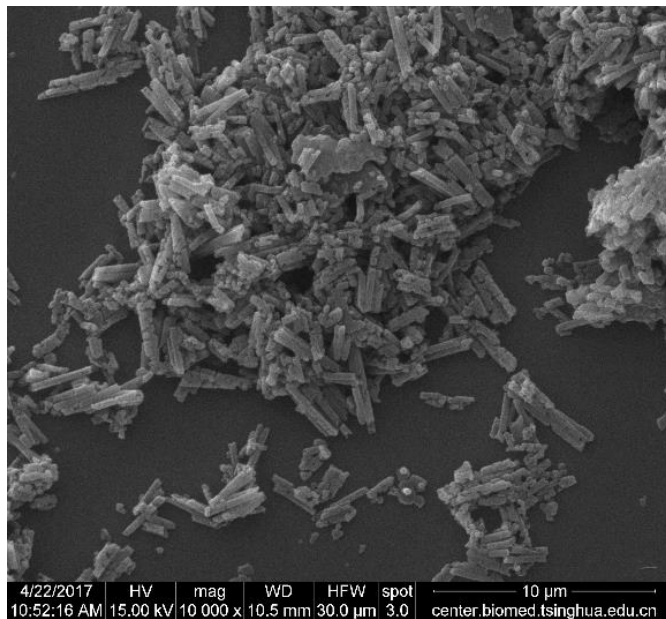


Fig. S7. SEM image of fractured 1D ZIF-8 superstructures.

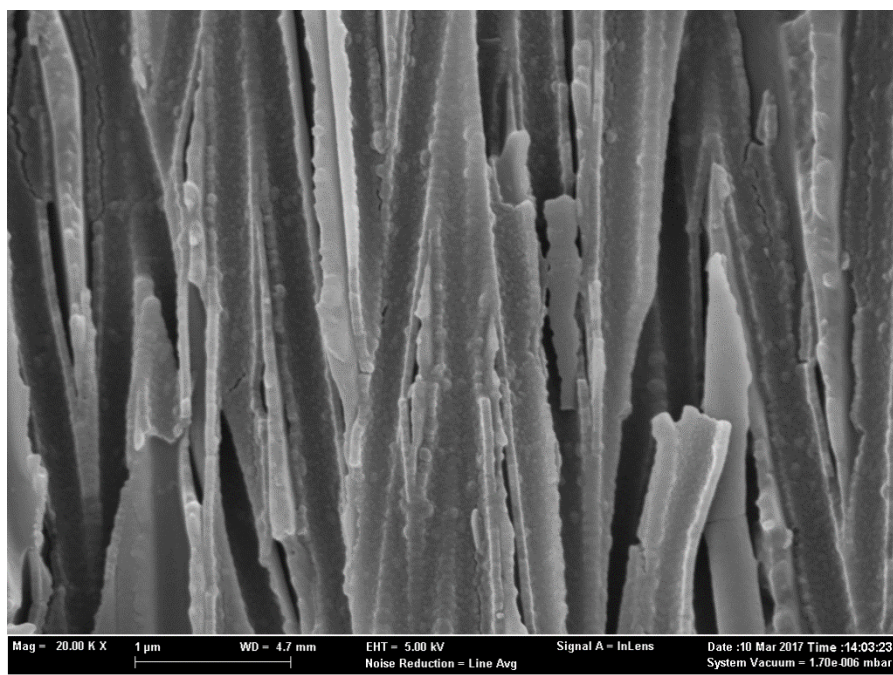


Fig. S8. Section view SEM image of ZIF-8 deposited PCTM@PDA.

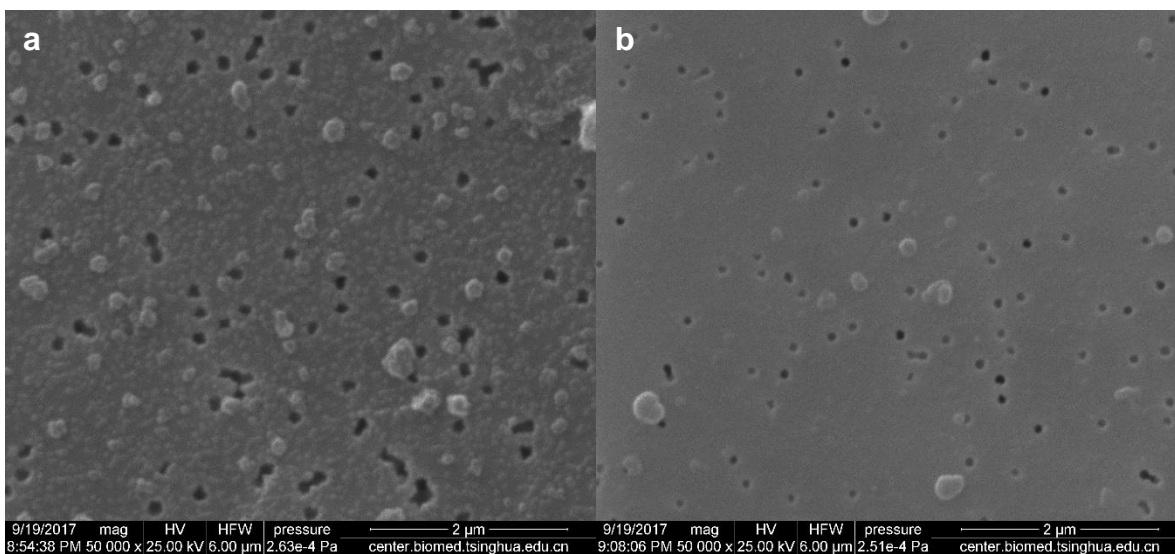


Fig. S9. Surfaces of PDA modified PCTM after contra-diffusion synthesis of ZIF-8: (a) the surface toward zinc solution, (b) the surface toward mIM solution.

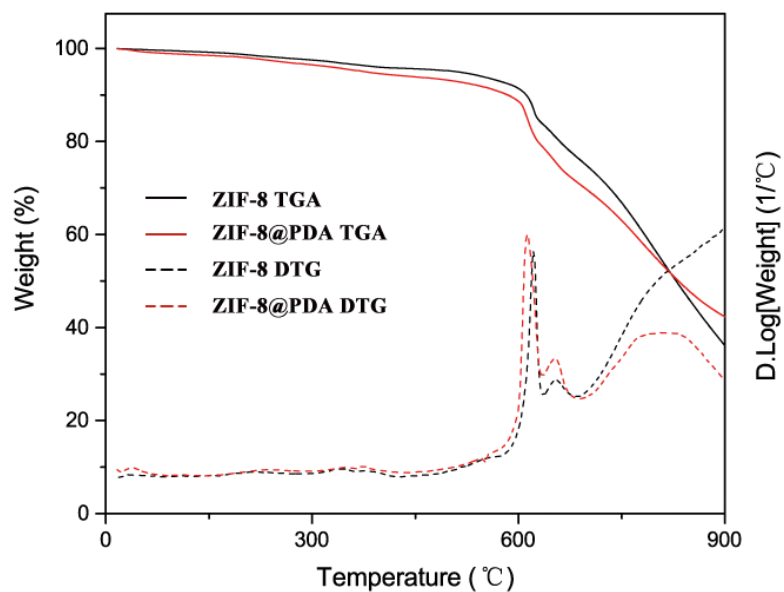


Fig. S10. TGA curves and DTG plots of ZIF-8 and ZIF-8@PDA nanotubes.

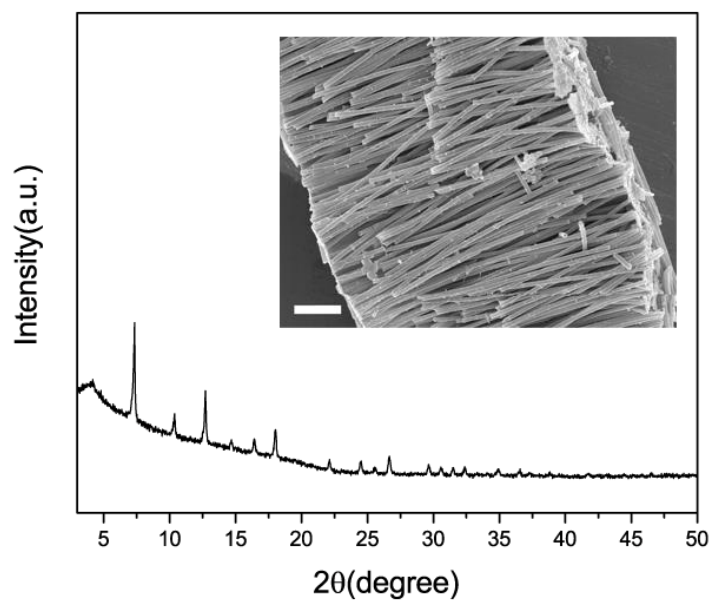


Fig. S11. XRD pattern and TEM image of ZIF-8@PDA nanotubes after heating treatment. The scale bar is 2 μm.

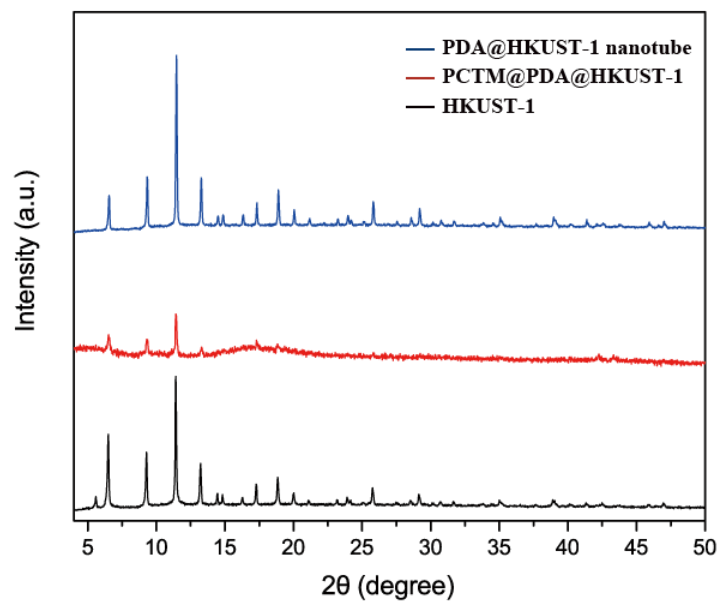


Fig. S12. XRD patterns of conventional HKUST-1 crystal (black), HKUST-1 deposited on PDA modified PCTM (red) and isolated 1D HKUST-1 nanotubes (blue).

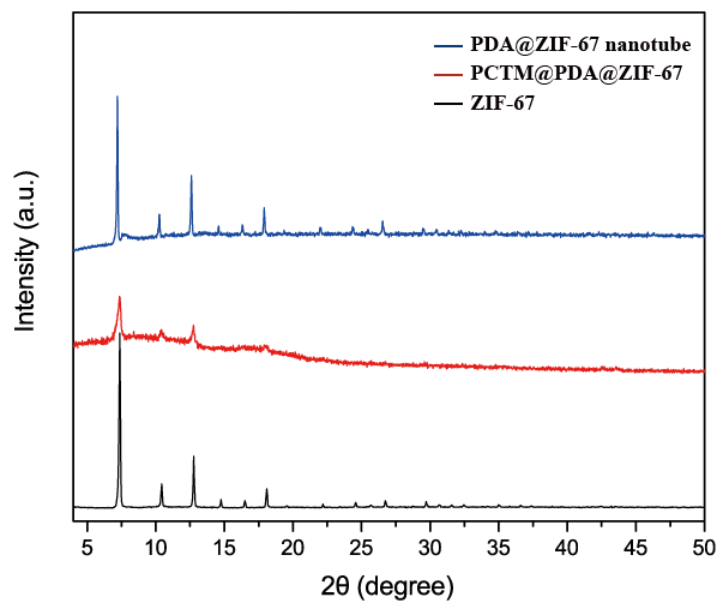


Fig. S13. XRD patterns of conventional ZIF-67 crystal (black), ZIF-67 deposited on PDA modified PCTM (red) and isolated 1D ZIF-67 nanotubes (blue).

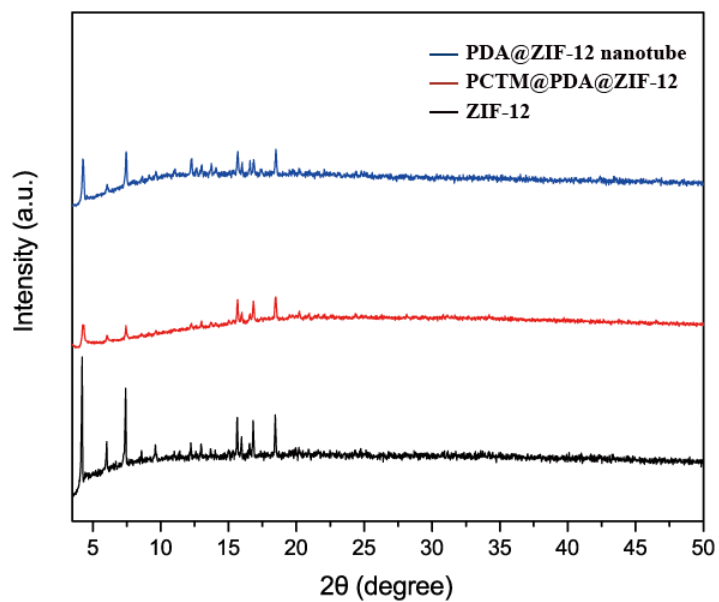


Fig. S14. XRD patterns of conventional ZIF-12 crystal (black), ZIF-12 deposited on PDA modified PCTM (red) and isolated 1D ZIF-12 nanotubes (blue).

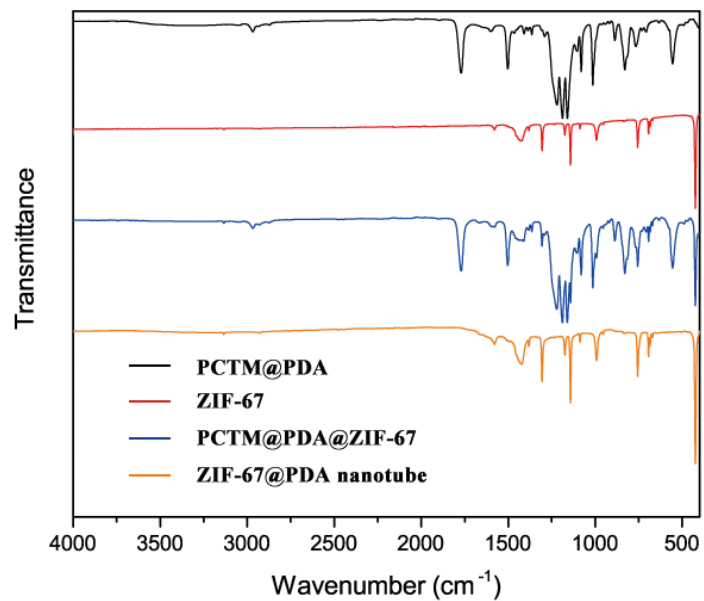


Fig. S15. FTIR spectra of PDA modified PCTM (black), conventional HKUST-1 crystal (red), HKUST-1 deposited on PDA modified PCTM (blue) and isolated 1D HKUST-1 nanotubes (orange).

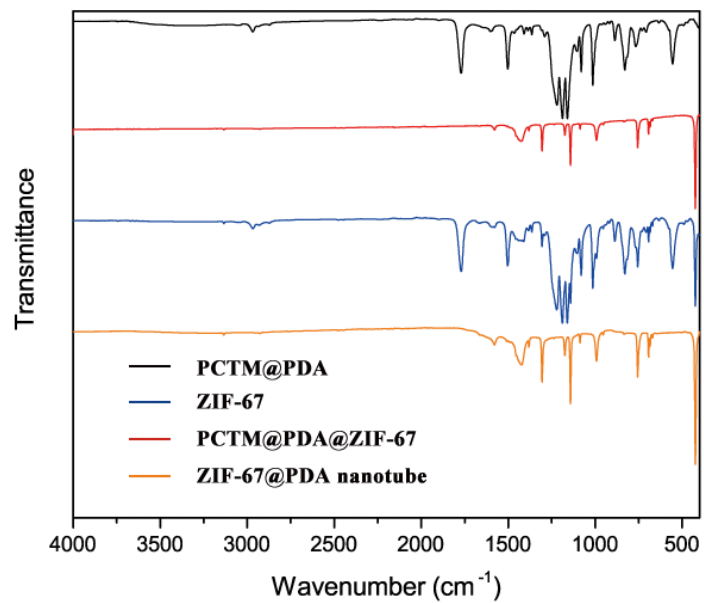


Fig. S16. FTIR spectra of PDA modified PCTM (black), conventional ZIF-67 crystal (red), ZIF-67 deposited on PDA modified PCTM (blue) and isolated 1D ZIF-67 nanotubes (orange).

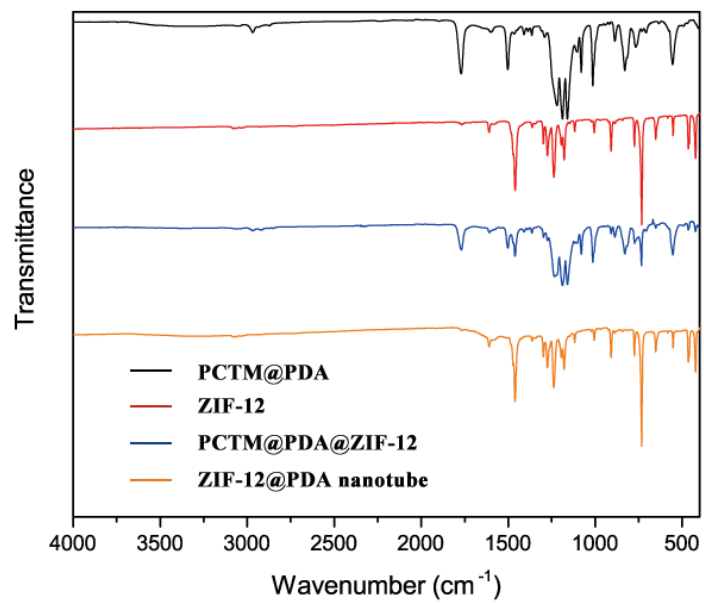


Fig. S17. FTIR spectra of PDA modified PCTM (black), conventional ZIF-12 crystal (red), ZIF-12 deposited on PDA modified PCTM (blue) and isolated 1D ZIF-12 nanotubes (orange).

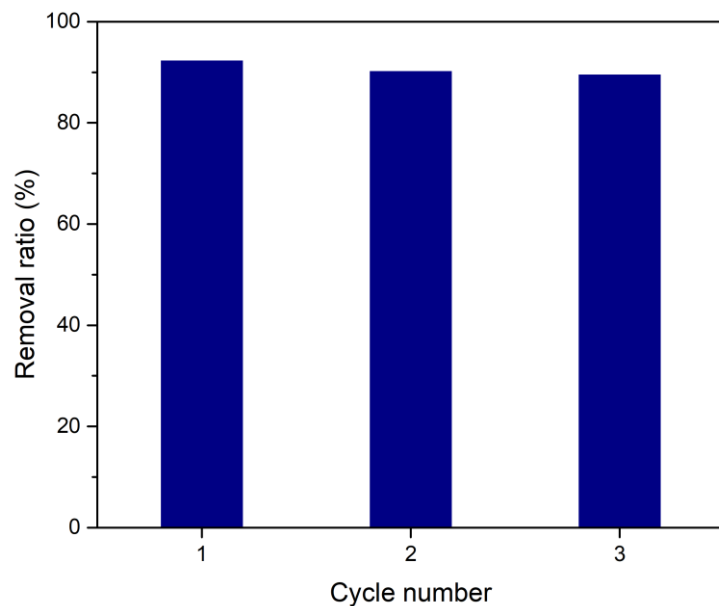


Fig. S18. Removal ratio of methylene blue in water by virgin and regenerated PCTM@PDA@ZIF-8 composite membranes in 3 cycles, concentration: 5 mg/L, flow rate: 3 mL/min, membrane area: 1.2 cm², temperature: 298 K.

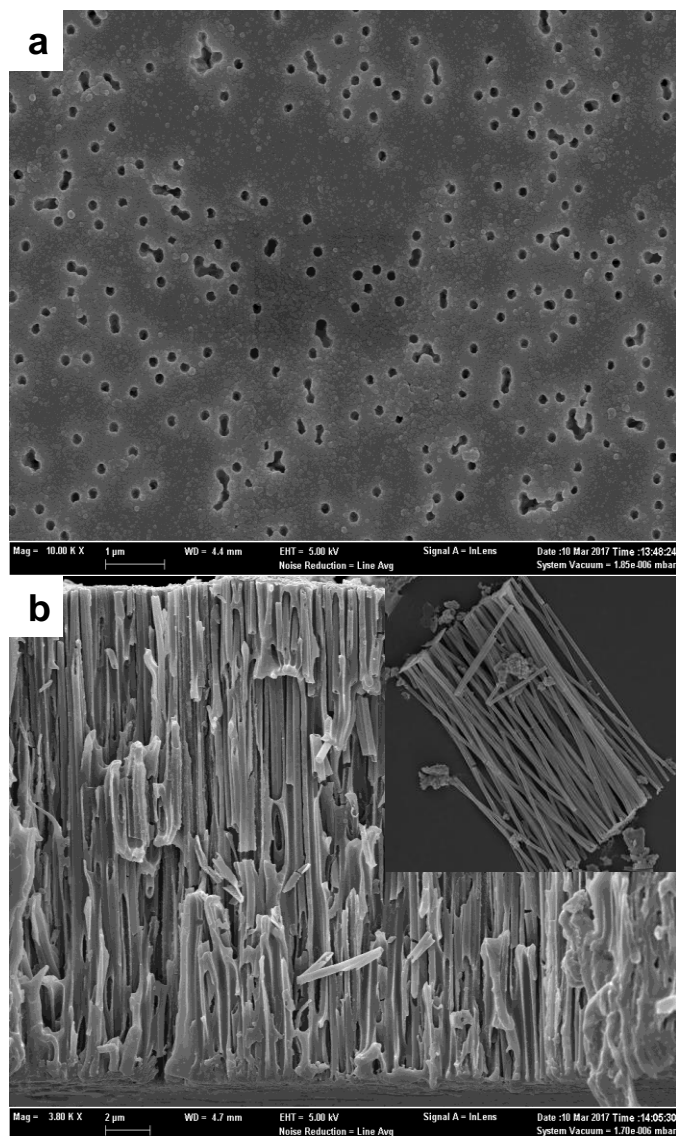


Fig. S19. Surface (a) and section (b) view SEM images of regenerated PCTM@PDA@ZIF-8. Inset is ZIF-8@PDA nanotubes prepared from (b).

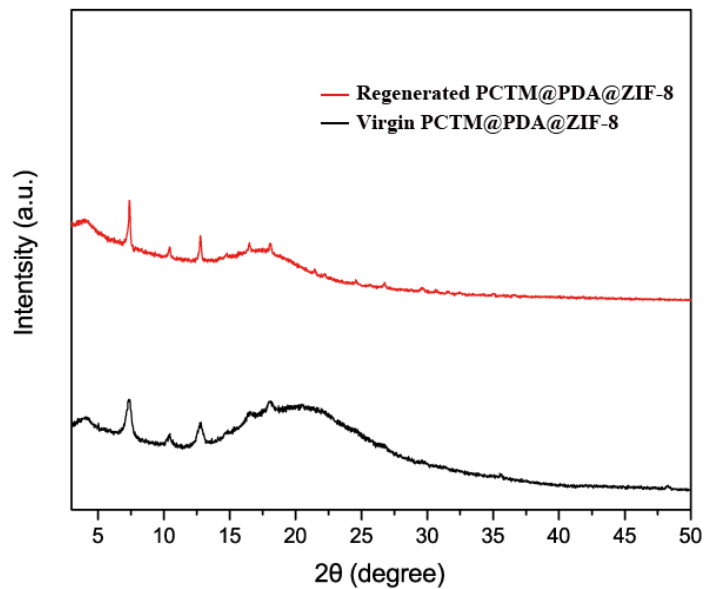


Fig. S20. XRD patterns of virgin (black) and regenerated (red) PCTM@PDA@ZIF-8 composite membranes.