

Supplementary Information for

**Superior Antibacterial Activity of Fe₃O₄@Copper (II)
Metal-organic Framework Core-shell Magnetic
Microspheres**

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Materials and characterization. All commercial chemicals are of analytical grade and were used without further purification. The morphology of the samples were characterized by a Tescan Vega3 scanning electron microscope (SEM). The crystalline structure was determined by Rigaku-DMax 2400 X-ray diffraction (XRD) system. TEM images were obtained using a Philips Tecnai G2 20 transmission electron microscope. Thermo gravimetric analysis (TGA) was performed on a Mettler Toledo TGA/DSC3+ instrument to measure the weigh loss curves at a heating rate of 10°·min⁻¹ under an air atmosphere. The infrared spectroscopy (IR) spectra was acquired on a Bruker IFS 66 V interferometer One FTIR spectrophotometer. The UV-vis spectra were recorded on Lambda 750S ultraviolet spectrophotometer. ICP analysis was

conducted on inductively coupled plasma emission spectrometer (Optima2000DV,
Perkinelmer).

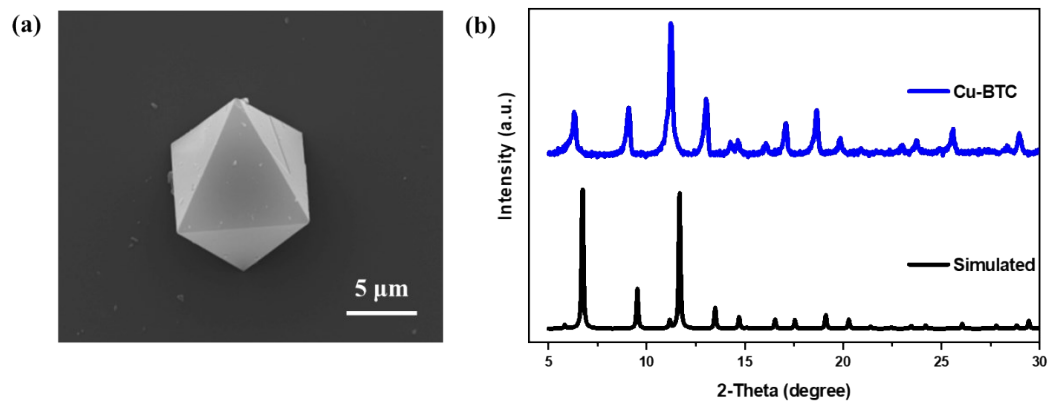


Fig. S1 SEM image and XRD patterns of Cu-BTC crystals

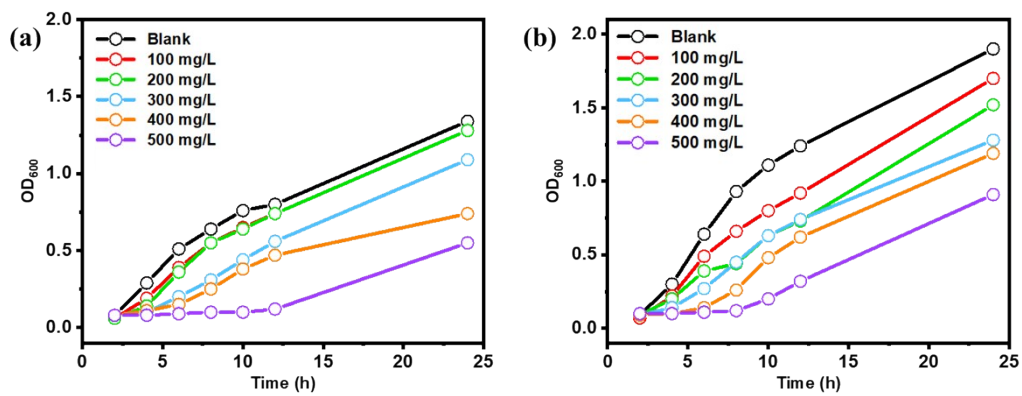


Fig. S2 Growth curve of Cu-BTC against (a) *E. coli* and (b) *S. aureus*.

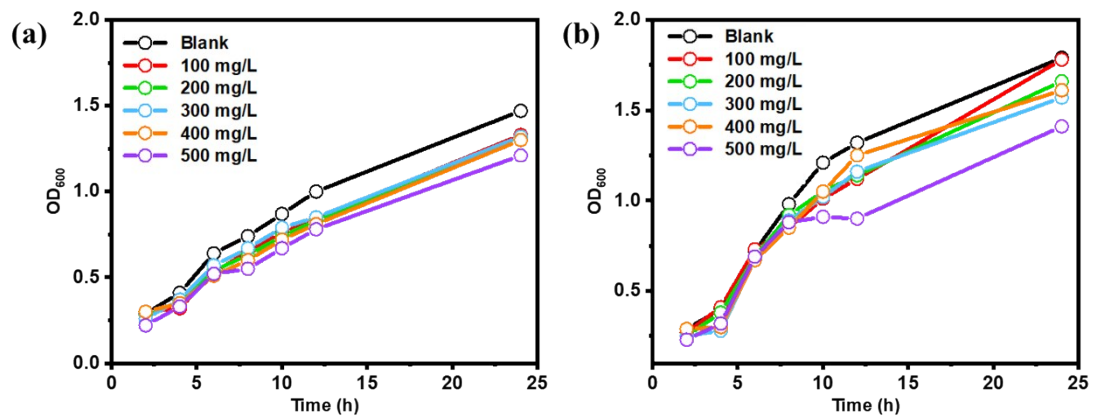


Fig. S3 Growth curve of Fe_3O_4 against (a) *E. coli* and (b) *S. aureus*.

Table S1. Summary of antibacterial action of reported copper-based MOFs composites

MOFs composites	Metal	Microbial strains	Antibacterial effect	Refs
Cu-H ₂ bpdC-Gu	Cu	<i>P. aeruginosa</i>	MIC=500 mg/L	1
[Cu(TDC)(H ₂ O) ₂] \cdot H ₂ O	Cu	<i>E. coli</i> and <i>S. aureus</i>	<i>E. coli</i> : MIC=150~200 mg/L. <i>S. aureus</i> MIC=150~200 mg/L	2
CuBTC-silk fiber	Cu	<i>E. coli</i> and <i>S. aureus</i>	Inhibition zone: <i>E. coli</i> =10 mm, <i>S. aureus</i> =27 mm	3
CuBTC-cellulosic fiber	Cu	<i>E. coli</i>	Total growth inhibition in liquid cultures and on contact area on agar plates	4
Cu ₃ (NH ₂ BTC) ₂ -cotton	Cu	<i>E. coli</i>	Resulting in a 4-log reduction after 24 h exposure	5
AC-HKUST-1	Cu	<i>P. aeruginosa</i>	MIC=50 mg/L	6
CuS@HKUST-1	Cu	<i>E. coli</i> and <i>S. aureus</i>	Antibacterial efficacy: 99.7 % within 20 min NIR irradiation	7
Fe ₃ O ₄ @Cu-BTC	Cu	<i>E. coli</i> and <i>S. aureus</i>	<i>E. coli</i> (<i>S. aureus</i>): Antibacterial efficacy of 97.4% (97.5%) at the concentration of 500 mg/L (400 mg/L) after 24 h cocultivation.	This work

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