

## Supplementary Information

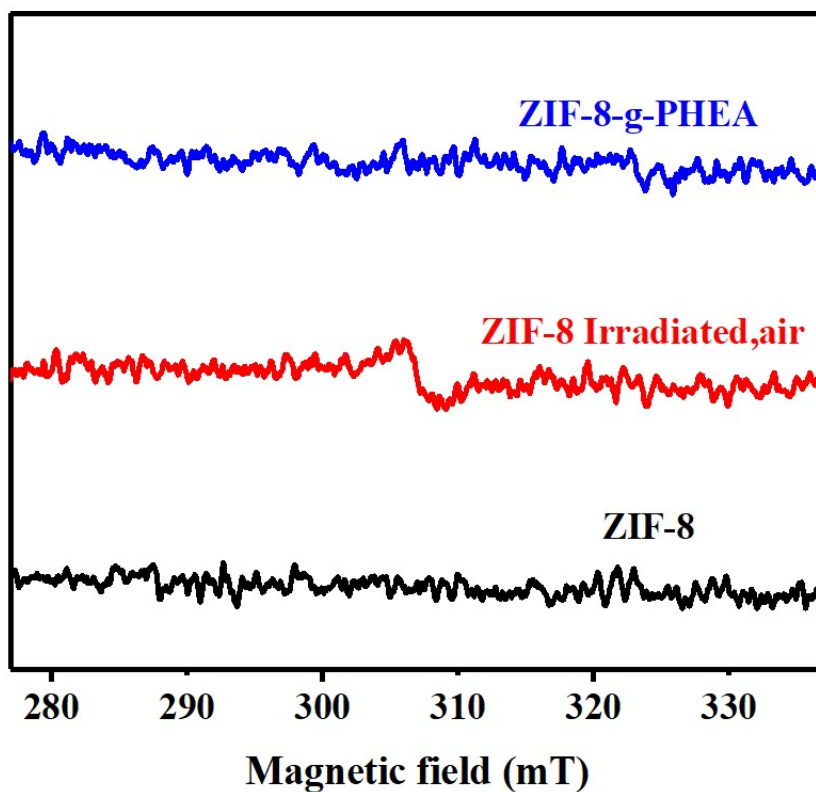
**Title:** Electron beam irradiation grafting of metal-organic frameworks onto cotton to prepare antimicrobial textiles.

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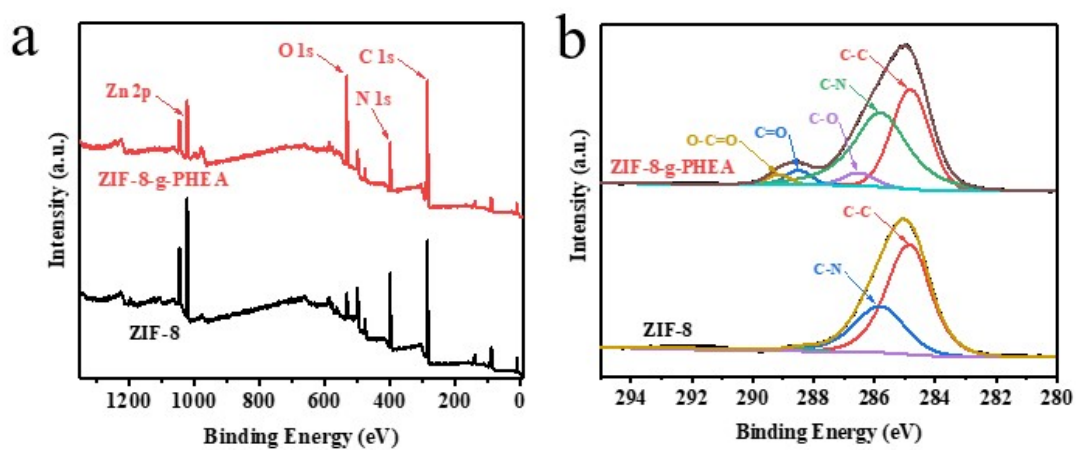
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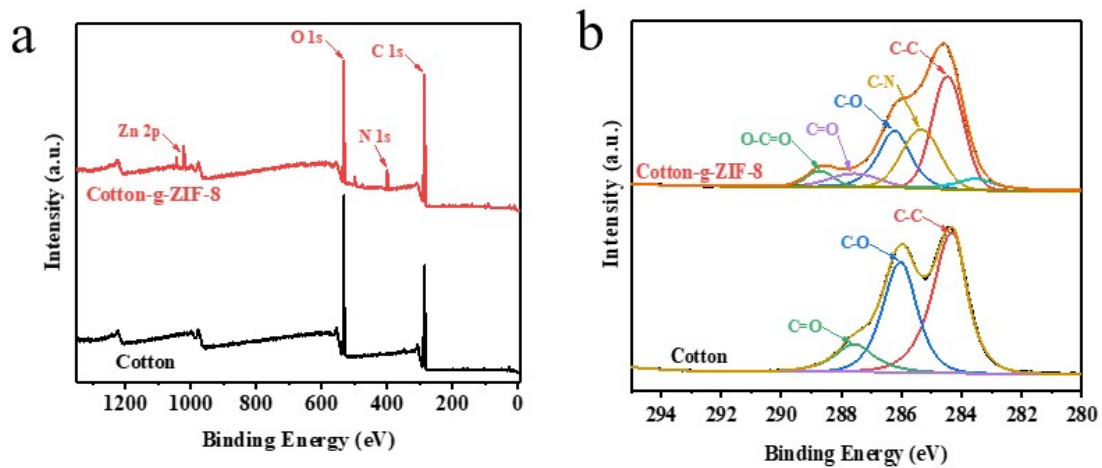
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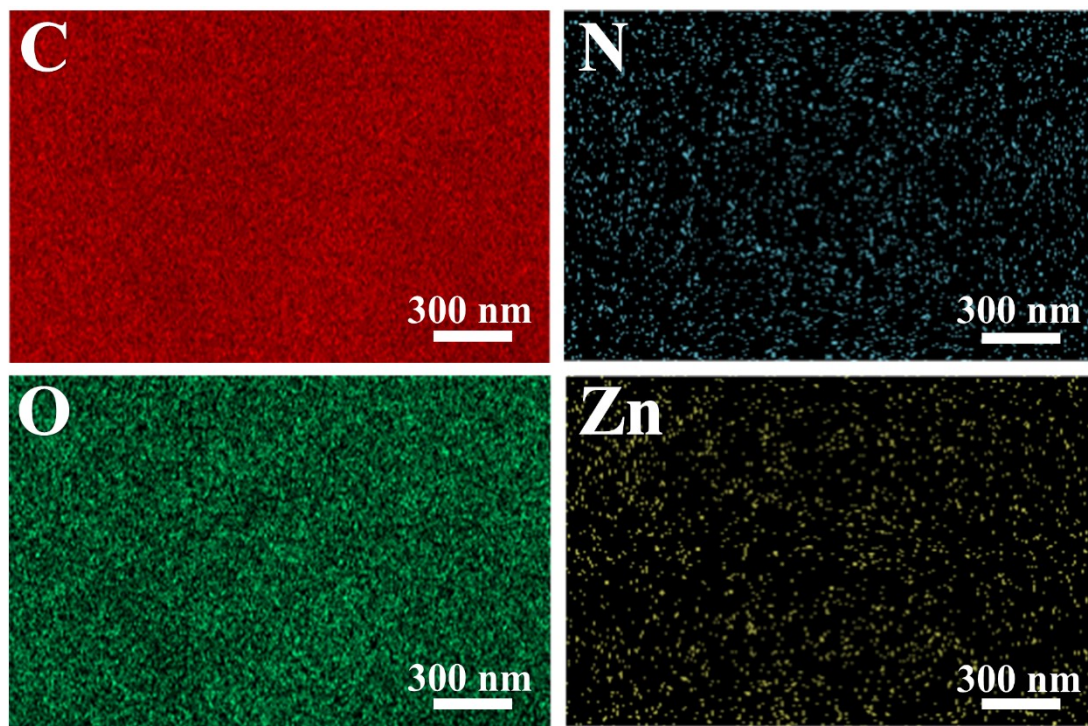
**Figure S1.** The electron spin-resonance (ESR) spectroscopy of ZIF-8, ZIF-8 irradiated in air and ZIF-8-g-PHEA.



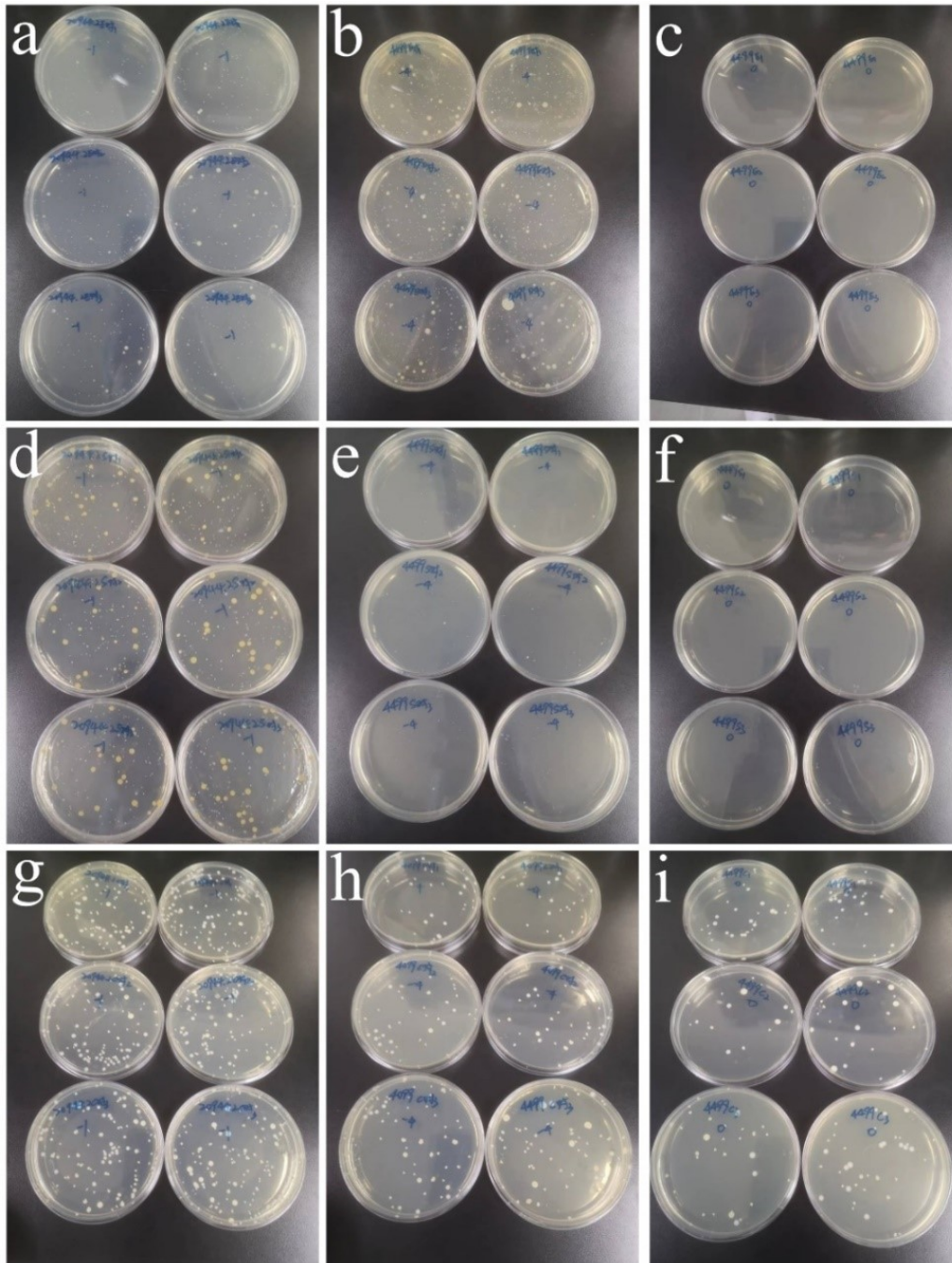
**Figure S2.** ZIF-8 and its radiation effect. **a**, XPS spectra of ZIF-8 and ZIF-8-g-PHEA. **b**, XPS C1s spectra of ZIF-8 and ZIF-8-g-PHEA.



**Figure S3.** Characterization of Cotton-g-ZIF-8. **a**, XPS spectra of Cotton and Cotton-g-ZIF-8. **b**, XPS C1s spectra of Cotton and Cotton-g-ZIF-8.



**Figure S4.** EDS analysis of Cotton-g-ZIF-8.



**Figure S5.** Antimicrobial performance of Cotton-g-ZIF-8. **a**, Control sample at 0 h (dilution ratio  $10^{-1}$ ); **b**, control sample at 24 h (dilution ratio  $10^{-4}$ ); **c**, Cotton-g-ZIF-8 at 24 h (dilution ratio  $10^0$ ) for *Escherichia coli*. **d**, Control sample at 0 h (dilution ratio  $10^{-1}$ ); **e**, control sample at 24 h (dilution ratio  $10^{-4}$ ); **f**, Cotton-g-ZIF-8 at 24 h (dilution ratio  $10^0$ ) for *Staphylococcus aureus*. **g**, Control sample at 0 h (dilution ratio  $10^{-1}$ ); **h**, control sample at 24 h (dilution ratio  $10^{-4}$ ); **i**, Cotton-g-ZIF-8 at 24 h (dilution ratio  $10^0$ ) for *Candida albicans*.

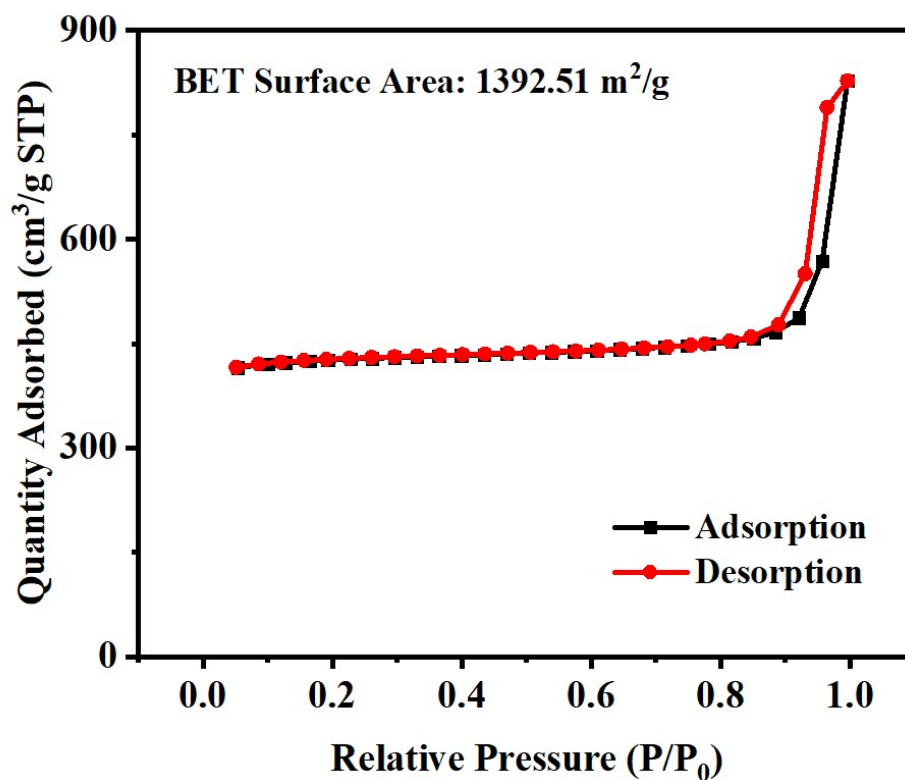


Figure S6. BET analysis of ZIF-8.

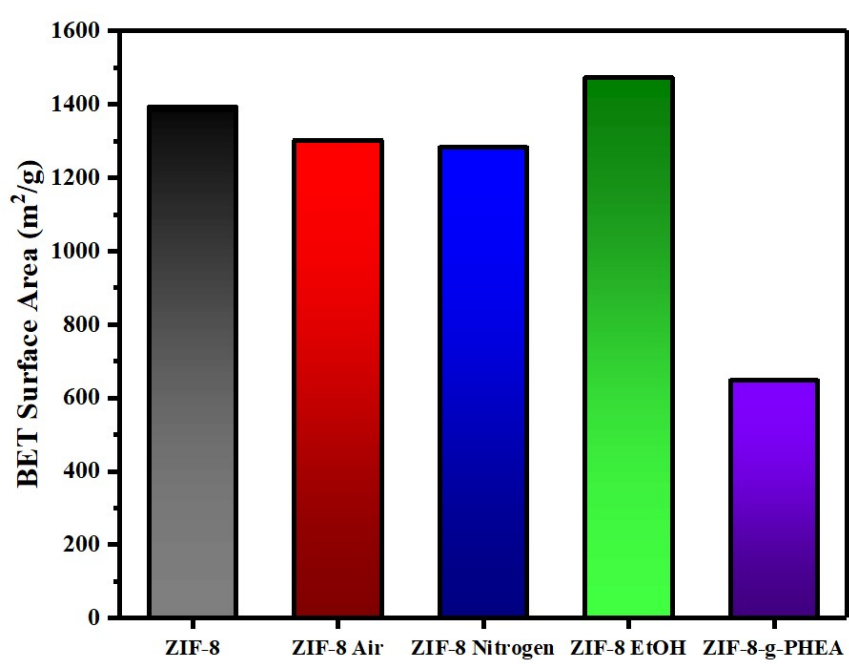


Figure S7. BET analysis of ZIF-8 and its irradiated products (at an absorbed dose of 50 kGy) in different environments.