Acidity-responsive Polyoxometalate with inflammatory retention for NIR-Ⅱ Photothermal-enhanced Chemodynamic Antibacterial Therapy

Yunhao Shi,[ac] Jiajia Yin,[c] Qinqin Peng,[c] Xinyi Lv,[c] Qinzhe Li,[c] Dongliang Yang,*[c] Xuejiao Song,*[c] Wenjun Wang[b] and Xiaochen Dong*[acd]

[a]Frontiers Science Center for Flexible Electronics (FSCFE), Shaanxi Institute of Flexi-ble Electronics (SIFE) & Shaanxi Institute of Biomedical Materials and Engineering (SIBME), Northwestern Polytechnical University (NPU), 127 West Youyi Road, Xi'an 710072, China.

[b]School of Physical Science and Information Technology, Liaocheng University, Liaocheng 252059, China.

[c]Institute of Advanced Materials (IAM), School of Physical and Mathematical Sciences, Nanjing Tech University (NanjingTech), 30 South Puzhu Road, Nanjing 211816, China. *E-mail: yangdl1023@njtech.edu.cn; xjsong@njtech.edu.cn; iamxcdong@njtech.edu.cn*

[d]School of Chemistry and Materials Science, Nanjing University of Information Science & Technology, Nanjing 210044, China.

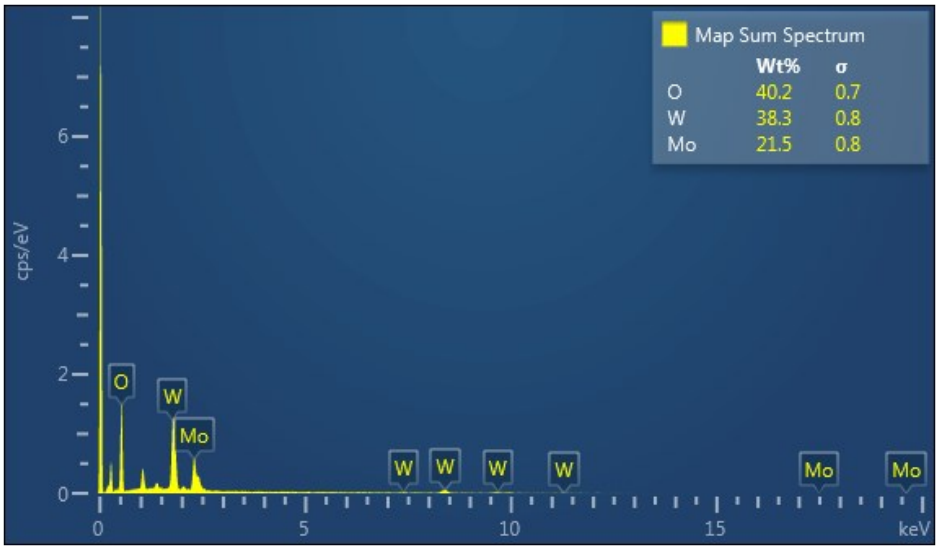

Fig. S1 EDX spectrum of POM.

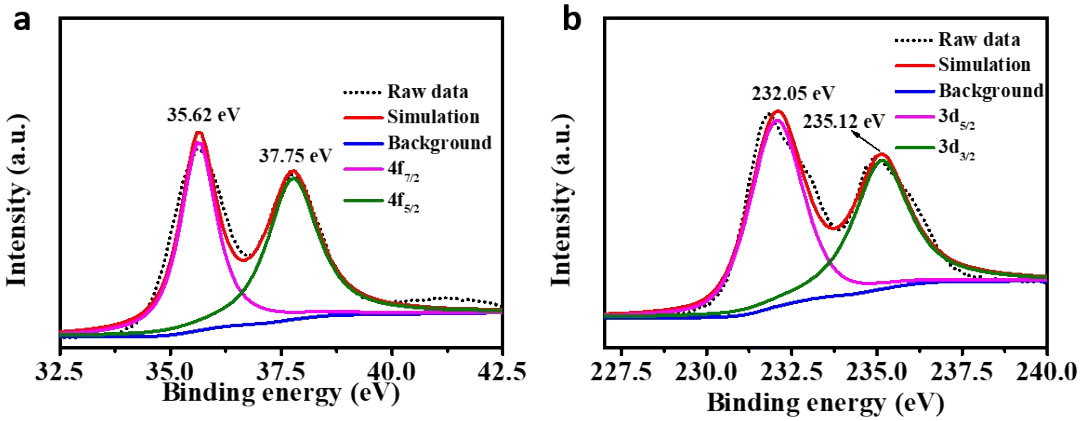

Fig. S2 (a)W 4f and (b) Mo 3d X-ray photoelectron spectroscopy (XPS) spectra of POM.

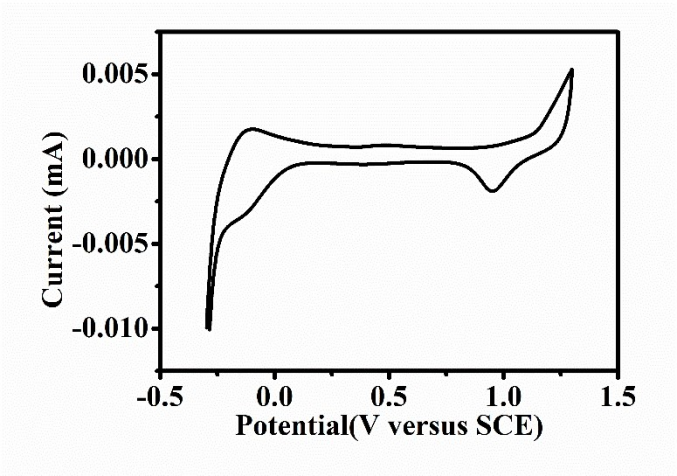

Fig. S3 Cyclic voltammogram of POM.

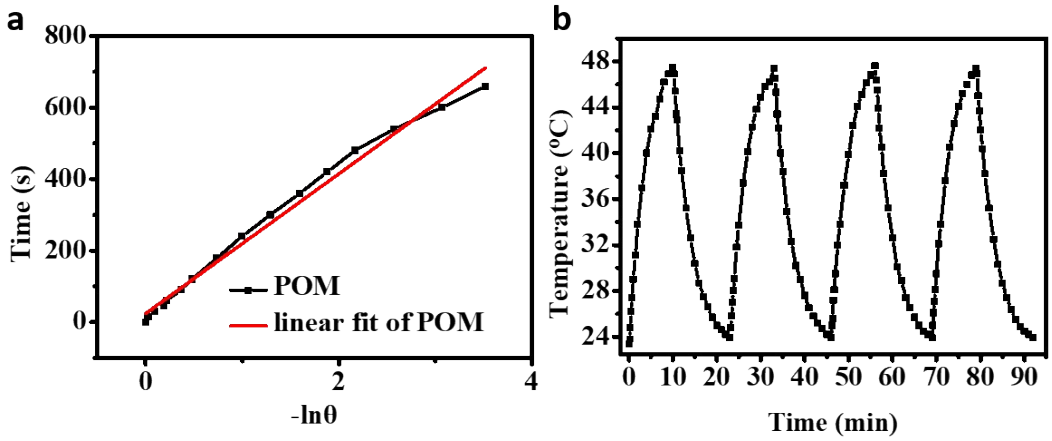

Fig. S4 (a) The relationship between time and -Inθ obtained from the cooling time of POM under irradiation with 1060 nm laser. (b) Photothermal stability assay under 1060 nm laser irradiation (1 W cm^{-2}).

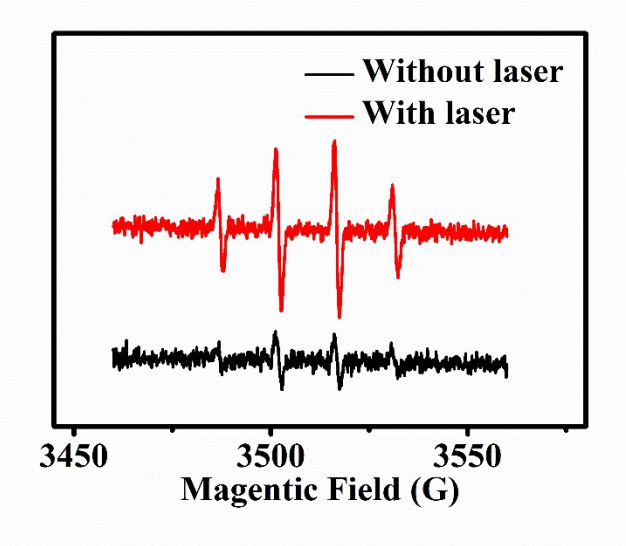

Fig. S5 ESR spectra of POM after reacted with H_2O_2 in the presence or absence of laser irradiation.

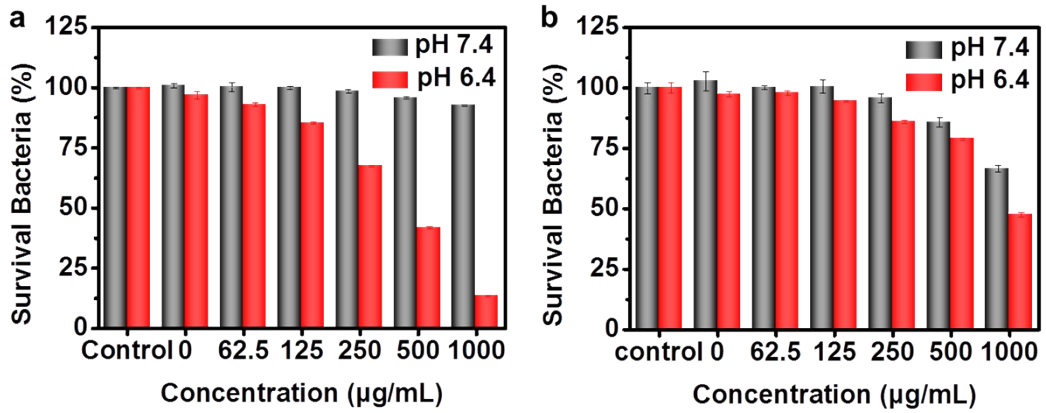

Fig. S6 (a) Relative bacterial activity of *S. aureus* after treated with different pH of POM solution under laser irradiation. (b) Relative bacterial viability of *S. aureus* after treated with different concentration of POM and H_2O_2 (1 mM).

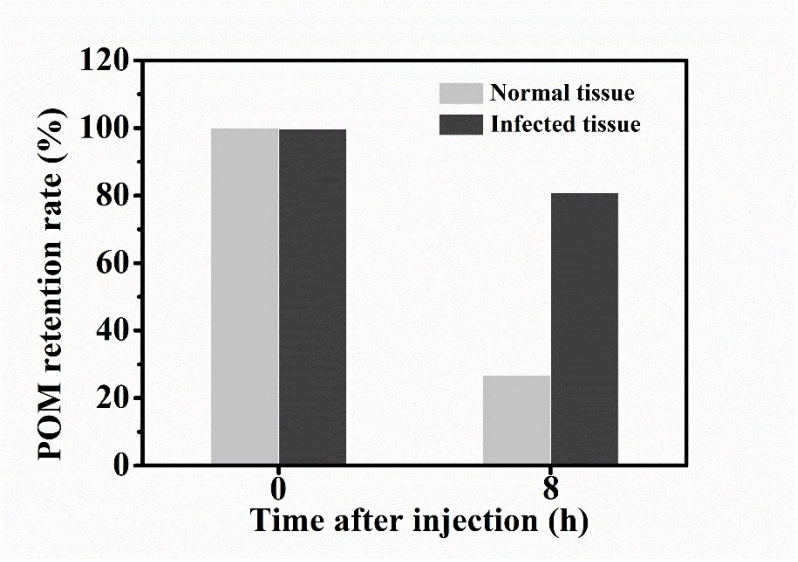

Fig. S7 Retention amount of POM in infected and normal tissue.

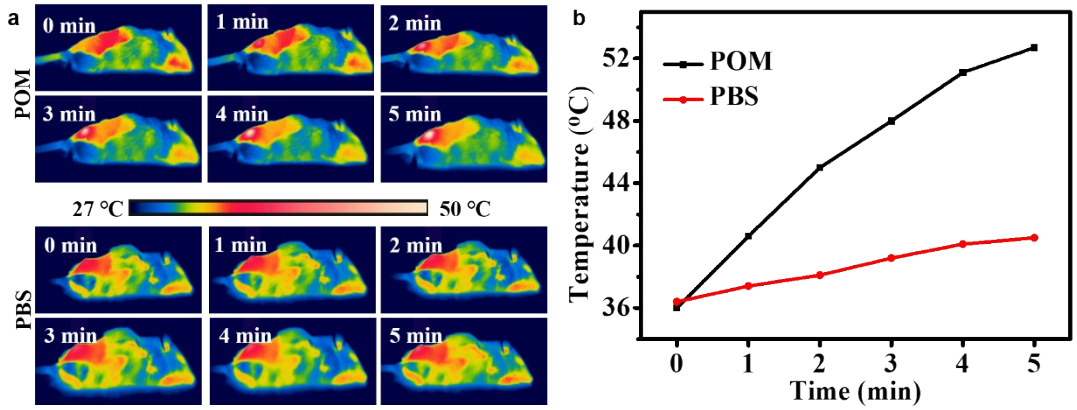

Fig. S8 (a) Infrared thermograph of mice after PBS or POM injection. (b) Temperature change under laser irradiation.

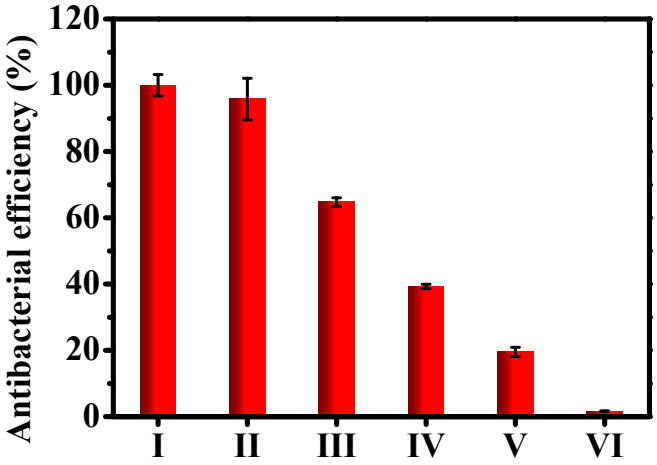

Fig. S9 Statistical result of colony count.

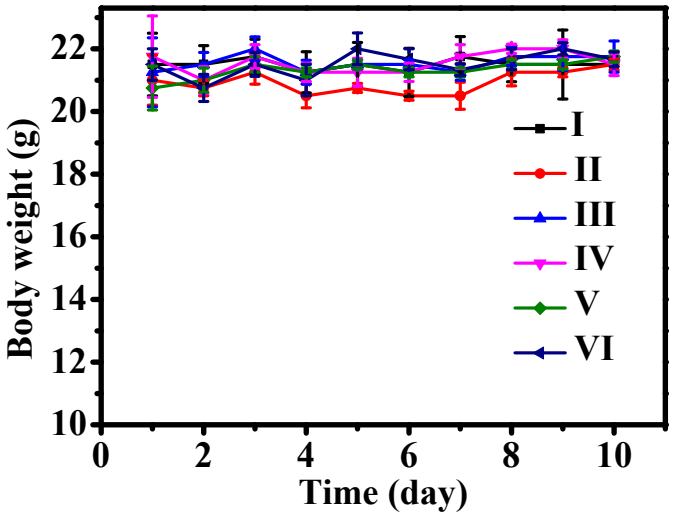

Fig. S10 Weight of mice in each group. (I) PBS, (II) H_2O_2, (III) POM, (IV) POM + H_2O_2, (V) POM + NIR, (VI) POM + H_2O_2 + NIR.

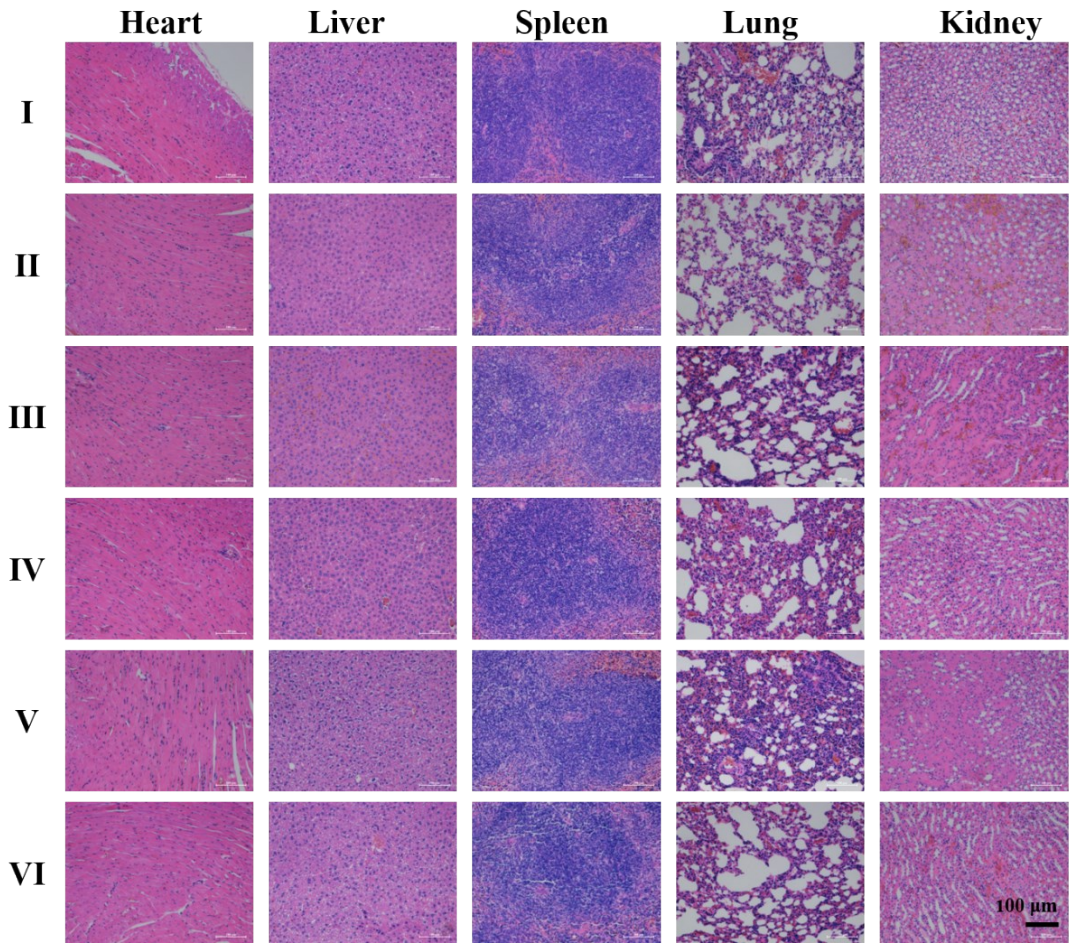

Fig. S11 H&E staining images of main organs (heart, liver, spleen, kidney, lung) of mice in each group. (I) PBS, (II) H_2O_2, (III) POM, (IV) POM + H_2O_2, (V) POM + NIR, (VI) POM + H_2O_2+ NIR, respectively.

Table S1. Complete blood counts of mice after subcutaneous injection of 25 μL of POM (500 μg mL^{-1}) for 1 d.

Item	Control	POM	Reference range	Unit
White blood cells	9.9	28.8	0.8-6.8	10^9/L
Lymphocyte	6.8	25.6	0.7-5.7	10^9/L
Granulocyte	2.8	2.7	0.1-1.8	10^9/L
Red blood cells	6.80	11.11	6.36-9.42	10^{12}/L
Hemoglobin	109	154	110-143	g/L
Hematocrit	33.1	46.1	34.6-44.6	%
Blood platelet	614	979	450-1590	10^9/L
Mean corpuscular volume	48.8	41.5	48.2-58.3	fL
Mean corpuscular hemoglobin	16.0	13.8	15.8-19	pg
Mean corpuscular hemoglobin	329	334	302-353	g/L
Alanine aminotransferase	83.6	100.4	10.0-96.5	U/L
Aspartate aminotransferase	105.3	139.3	36.3-235.5	U/L

Note: Blood routine examination and liver function analysis were performed by Servicebio Co., Ltd (Wuhan, China).