

Electronic Supporting Information

Development of functional composite Cu(II)-polyoxometalate/ PLA with antimicrobial properties

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Figure S1. SEM images of $\text{Na}_2\text{Cu}_3(\text{CuOH})_2[\text{W}_{12}\text{O}_{40}(\text{OH})_2] \cdot 32\text{H}_2\text{O}$ powder in the characteristic X-ray emission.

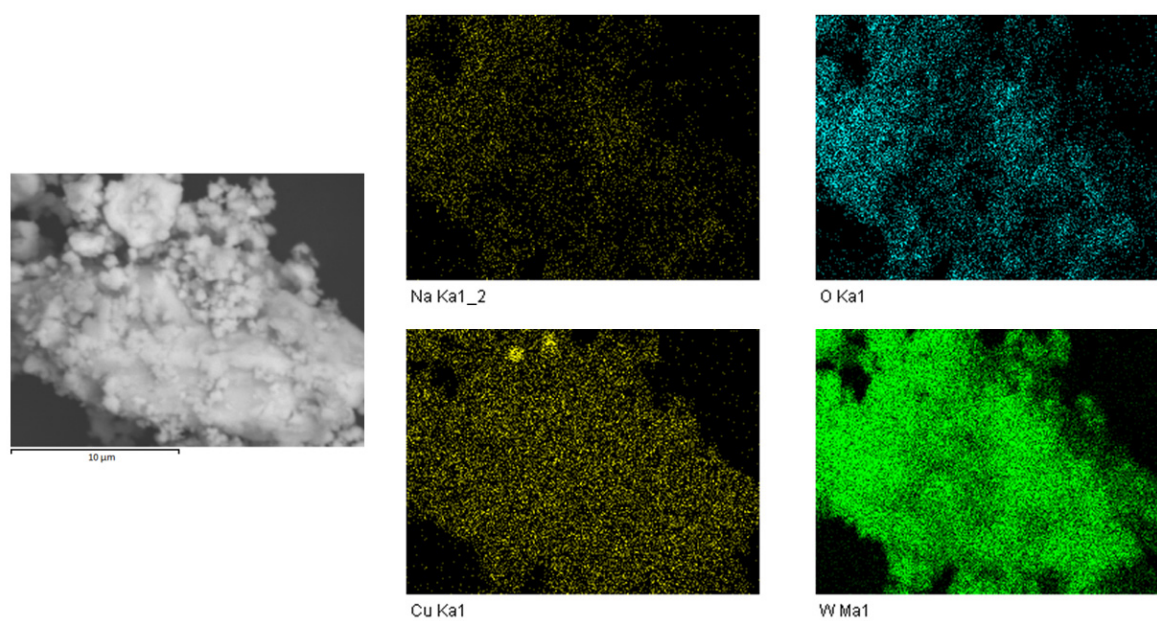
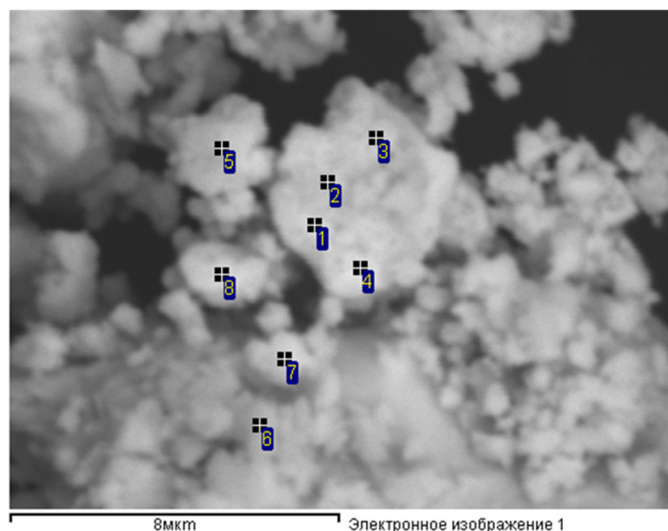


Figure S2. Surface micromorphology of triturated $\text{Na}_2\text{Cu}_3(\text{CuOH})_2[\text{W}_{12}\text{O}_{40}(\text{OH})_2] \cdot 32\text{H}_2\text{O}$ sample. EDX analysis was made in points indicated (see table below).



Atomic ratio of Na, Cu, and W in different points marked on Figure SI2 of triturated $\text{Na}_2\text{Cu}_3(\text{CuOH})_2[\text{W}_{12}\text{O}_{40}(\text{OH})_2] \cdot 32\text{H}_2\text{O}$ sample:

at. %	Points								Average	Atomic ratio
	1	2	3	4	5	6	7	8		
Na	1.25	1.19	1.16	1.21	1.20	1.15	1.13	1.18	1.18	1.99
Cu	8.33	8.24	8.20	8.31	8.30	8.27	8.32	8.24	8.28	5.02
W	57.11	57.09	57.20	57.19	57.15	57.25	57.28	57.20	57.18	11.99

Figure S3. ATR-FTIR spectra: (a) $\text{Na}_2\text{Cu}_3(\text{CuOH})_2[\text{W}_{12}\text{O}_{40}(\text{OH})_2] \cdot 32\text{H}_2\text{O}$, (b) PLA-POM film, (c) blank PLA film, (d) Extr. PLA-POM film, (e) blank Extr. PLA film

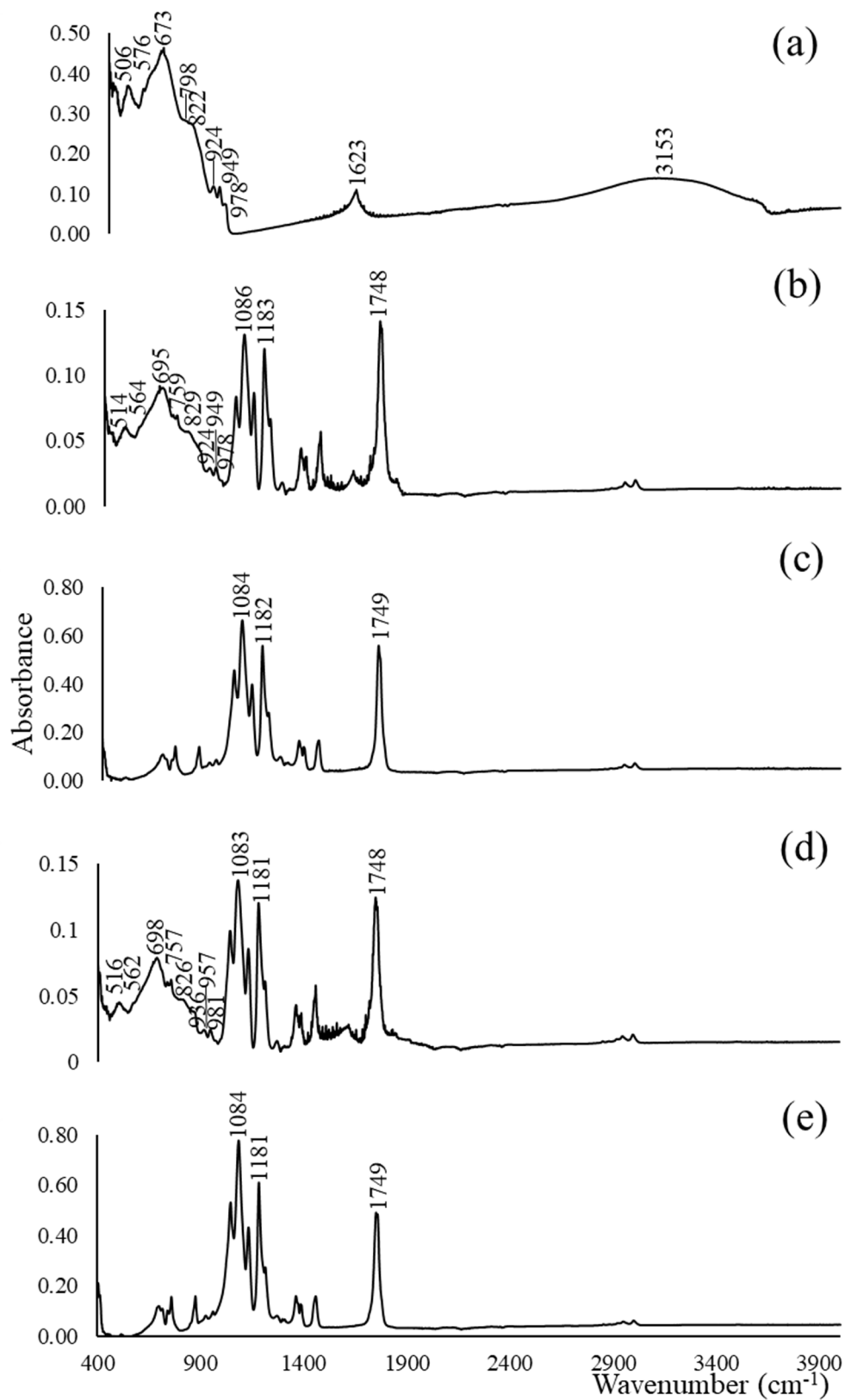


Figure S4. The superimposition of the ATR-FTIR spectra: (1) blank PLA film, (2) blank Extr. PLA film, (3) PLA-POM film, (4) Extr. PLA-POM film.

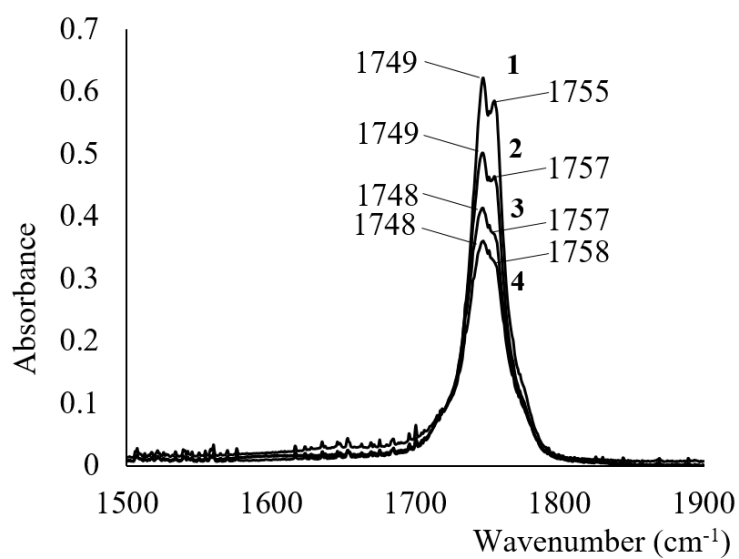


Figure S5. The DSC thermogram: (1) PLA-POM film, (2) blank PLA film, (3) Extr. PLA-POM film, (4) blank Extr. PLA film.

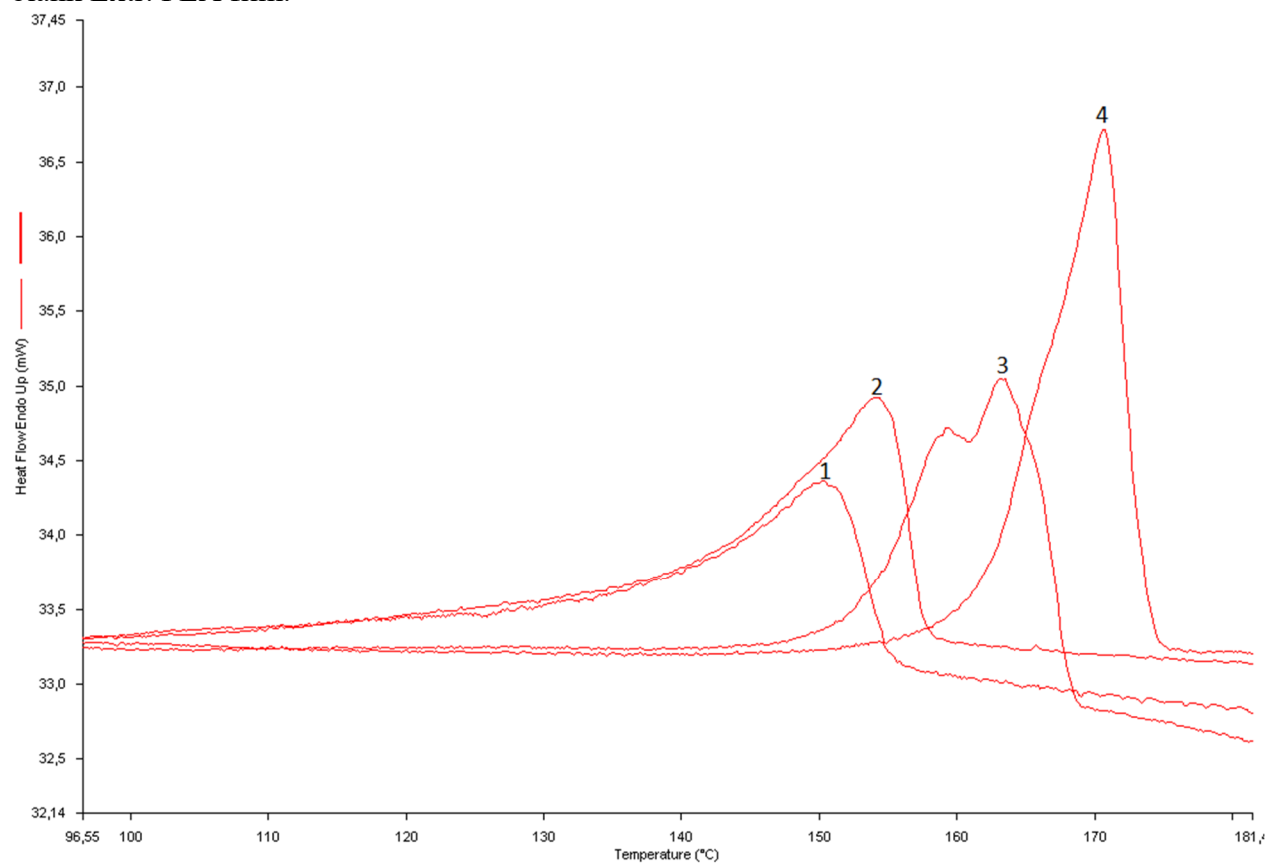


Figure S6. The results of minimum bactericidal concentration (MBC) determination for $\text{Na}_2\text{Cu}_3(\text{CuOH})_2[\text{W}_{12}\text{O}_{40}(\text{OH})_2] \cdot 32\text{H}_2\text{O}$ ($\mu\text{g/mL}$).

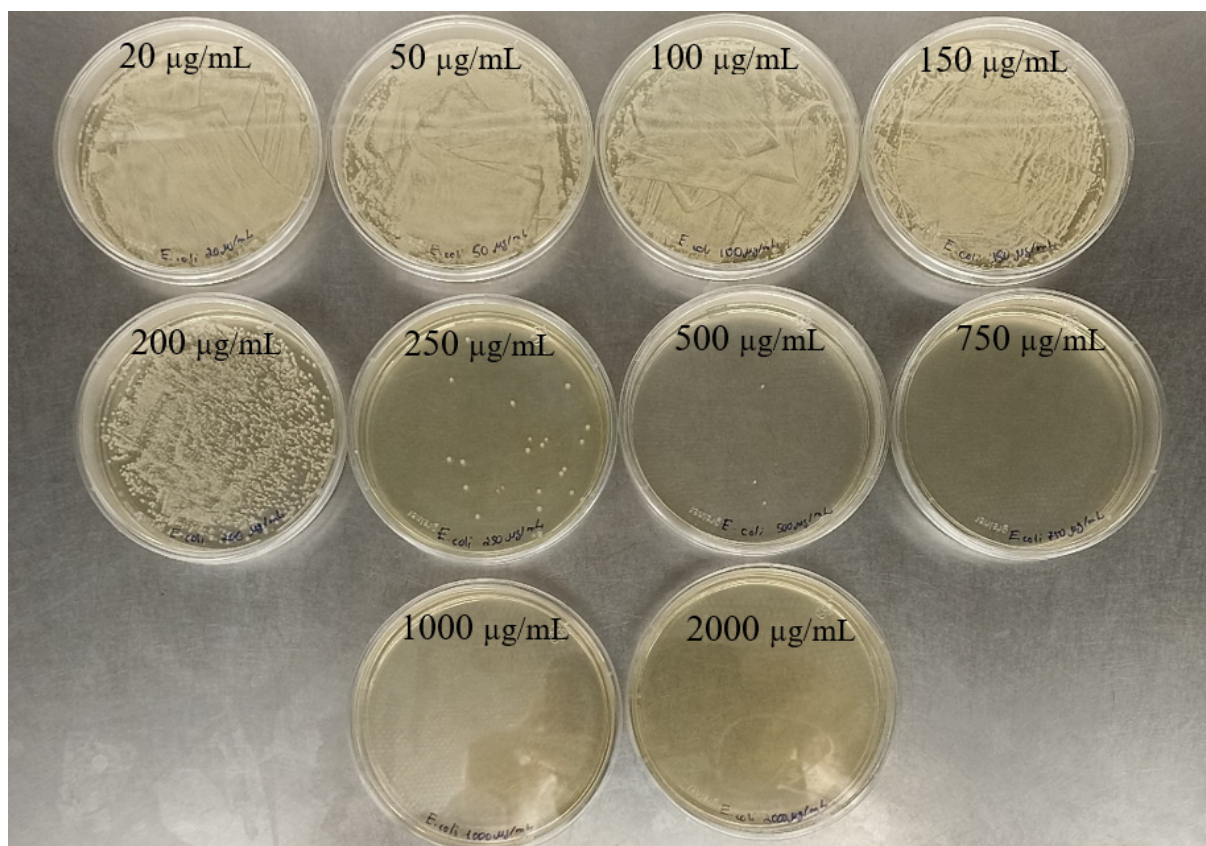


Figure S7. *E. coli* CFU after inoculation of the films in the wash by several dilutions (D – dilution factor): (a) Extr. PLA-POM film, (b) blank Extr. PLA film.

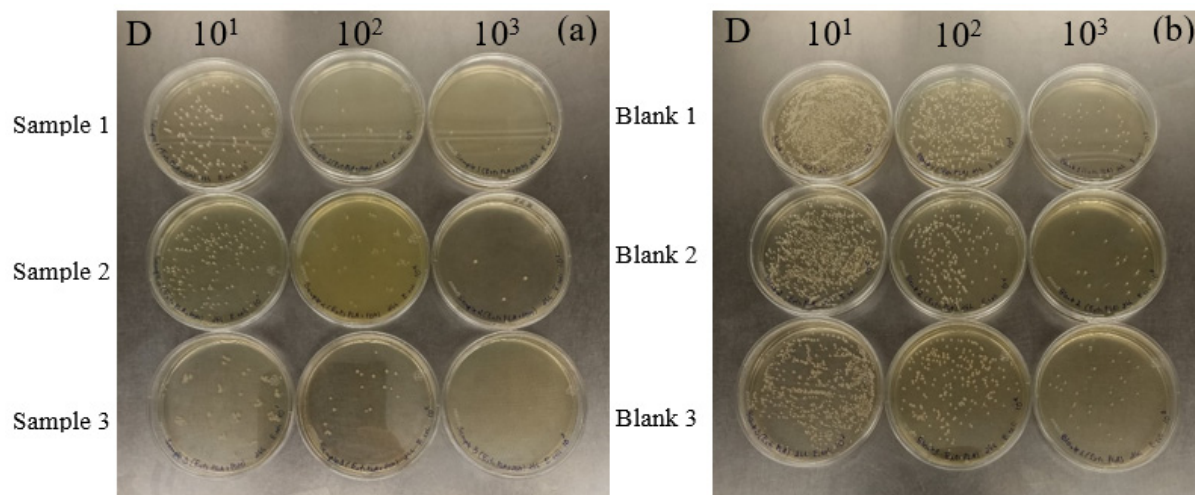


Figure S8. *E. coli* CFU after inoculation of the films in the wash by several dilutions (D – dilution factor): (a) PLA-POM film, (b) blank PLA film.

