

Supplementary Materials: Facile preparation of organo-modified ZnO/attapulgite nano-composites loaded with mono-ammonium glycyrrhizinate via mechanical milling and their synergistic antibacterial effect

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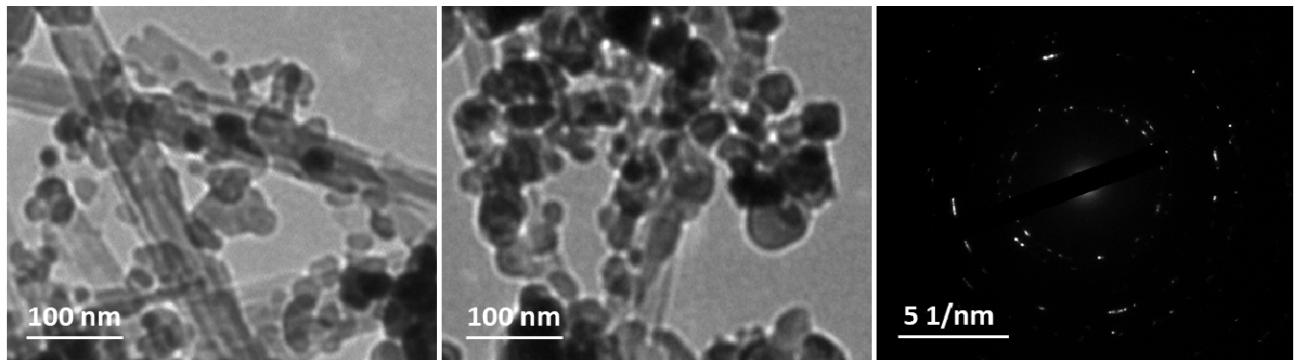


Figure S1. TEM images and SAED pattern of ZnO/APT.

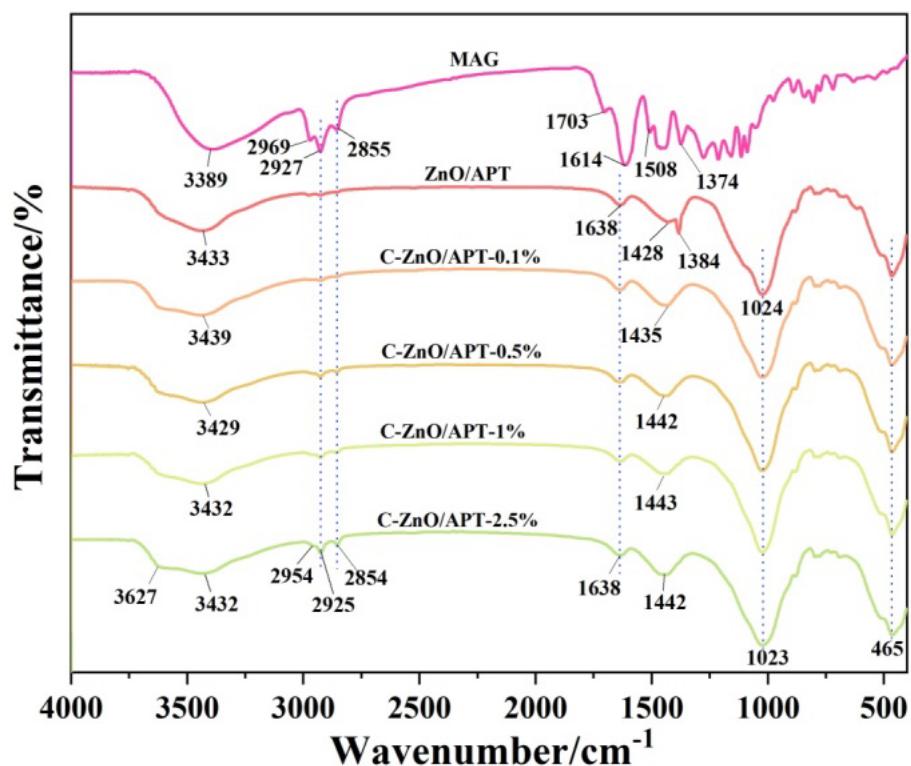


Figure S2. FTIR spectra of MAG, ZnO/APT and C-ZnO/APT nanocomposites with CTAB concentrations of 0.1%, 0.5%, 1% and 2.5%.

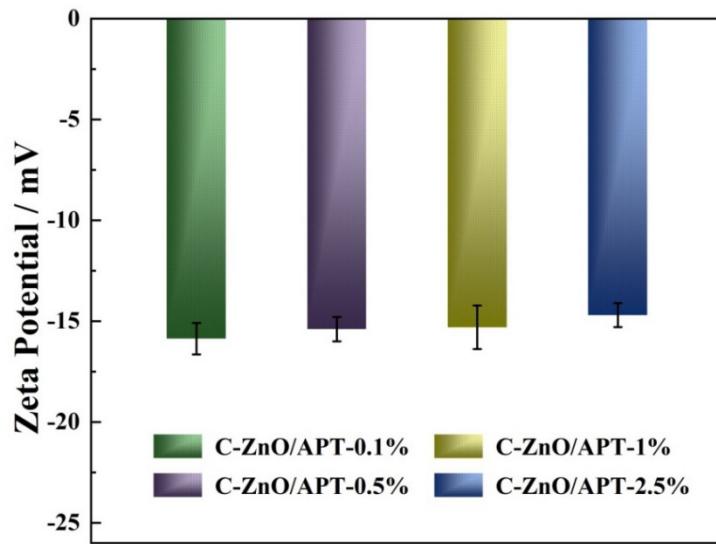


Figure S3. Zeta potential of C-ZnO/APT nanocomposites with CTAB concentrations of 0.1%, 0.5%, 1% and 2.5%.

Table S1. MIC values of MAG, ZnO/APT, and MAG/C-ZnO/APT nanocomposites toward *E. coli* and *S. aureus*.

Samples	Antibacterial activity (MIC in mg/mL)	
	<i>E. coli</i>	<i>S. aureus</i>
MAG	10	5
ZnO/APT	10	2.5
MAG/ZnO/APT	10	1
MAG/C-ZnO/APT-0.1%	>5	0.5
MAG/C-ZnO/APT-0.5%	5	0.5
MAG/C-ZnO/APT-1%	2.5	0.25
MAG/C-ZnO/APT-2.5%	1	0.1

Table S2. MIC values of C-ZnO/APT nanocomposites against *E. coli* and *S. aureus*.

Samples	Antibacterial activity (MIC in mg/mL)	
	<i>E. coli</i>	<i>S. aureus</i>
C-ZnO/APT-0.1%	>5	1
C-ZnO/APT-0.5%	5	0.5
C-ZnO/APT-1%	5	0.25
C-ZnO/APT-2.5%	2.5	0.1

Table S3. Comparison of our MAG/C-ZnO/APT nanocomposite with the reported antibacterial nanocomposites.

Nanocomposites	Preparation method	MIC values	Ref.
ZnO/Pal	Hydrothermal method	1.5 mg/mL for <i>E. coli</i> 5 mg/mL for <i>S. aureus</i>	[1]
ZnO/Pal	Hydrothermal method	1.5 mg/mL for <i>E. coli</i> 0.5 mg/mL for <i>S. aureus</i>	[2]
ZnO/kaoline (50 wt.% of ZnO)	-	0.41 mg/mL for <i>S. aureus</i> 0.41 mg/ml for <i>S. aureus</i>	[3]
ZnO/graphite (50 wt.%)	-	11.1 mg/mL for <i>E. coli</i> 100 mg/mL for <i>P. aeruginosa</i>	[4]
QACOS/ZnO/Pal	Electrostatic self-assembly process	0.5 mg/mL for <i>E. coli</i> 1 mg/mL for <i>S. aureus</i>	[5]
CAR/ZnO/PAL	adsorption process	0.5 mg/mL for <i>E. coli</i> 1.5 mg/mL for <i>S. aureus</i>	[6]
MAG/C-ZnO/APT	Mechanical milling method	1 mg/mL for <i>E. coli</i> 0.1 mg/mL for <i>S. aureus</i>	This study

References

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