Supporting information for

Facile and large-scale preparation of sepiolite-based composites and their antibacterial/rheological properties

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Experimental

E. coli and S. aureus were used as the test model bacteria to evaluate the antibacterial activities of the composites. Bacteria were grown at 37°C in LB broth (10 g/L yeast extract, 5 g/L tryptone, 10 g/L NaCl). The incubation E. coli solution was initially diluted to the desired concentrations. Then, 100 μL and 10μL obtained E. coli solutions were respectively added into 10ml deionized water. 0.1g Sep, Sep/Ag, Sep/CuO, and Sep/ZnO powders were added into the solution. The suspension was placed in a constant temperature shaker at 37°C and digested at 100 r/min for 15 min. The obtained diluted bacterial liquid was coated onto bouillon culture medium and incubated at 37°C for 12 h. As comparison, the specimen without composites was prepared as a control. The antibacterial rate (R_a) was calculated based on the colony count results:

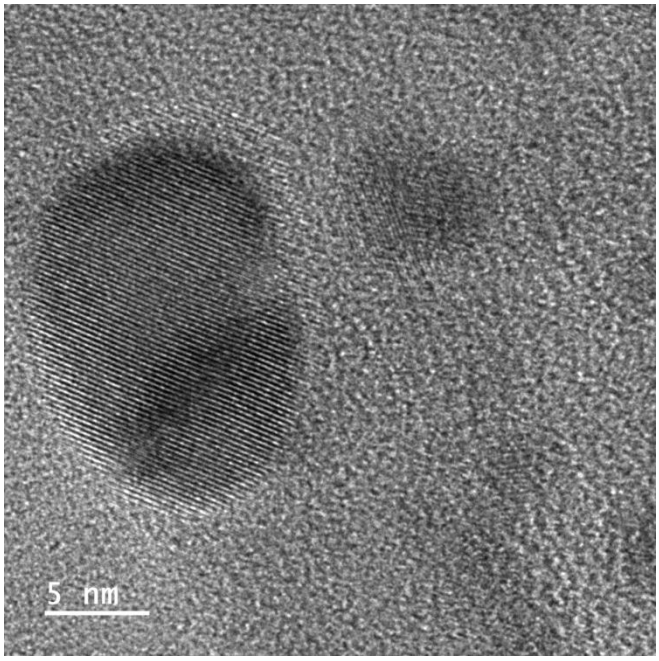
$$Ra=\frac{A-B}{A}\times 100\%$$

A: the average number of colonies in the control group; B: average number of colonies in the groups with antibacterial materials.

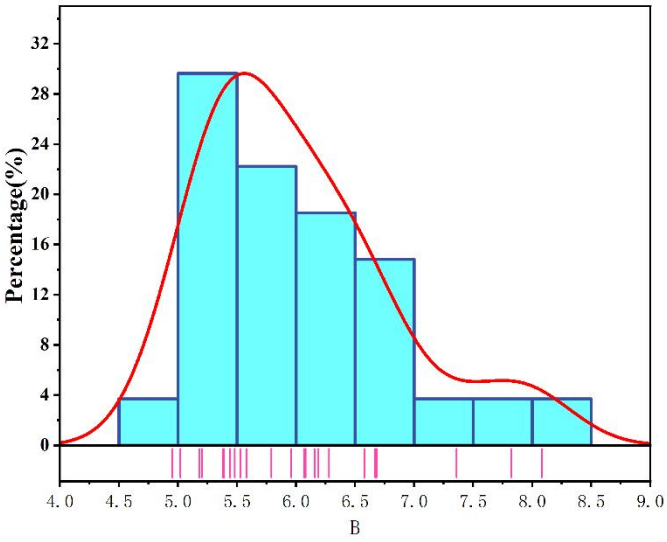
42.0 g agar was dissolved in 1000 ml distilled water. 960 mg Sep, Sep/Ag, Sep/CuO, and Sep/ZnO powders were added into 60 ml obtained agar solution. After autoclaved for 15 min at 121°C, the dispersions were placed on sterile dishes with a final concentration of 2mg/ml. The S. aureus solution

was inoculated on agar plates and incubated at 37°C overnight. A suspension of the bacteria S. aureus was adjusted to a 0.5 McFarland suspension. 1 μl bacterial suspension was inoculated into the as-prepared dishes. Positive and negative controls included S. aureus inoculated or with equal volumes of normal saline, respectively. All the specimens were placed in a 37°C incubator for 24 hours. Then, the number and size of colonies were observed.

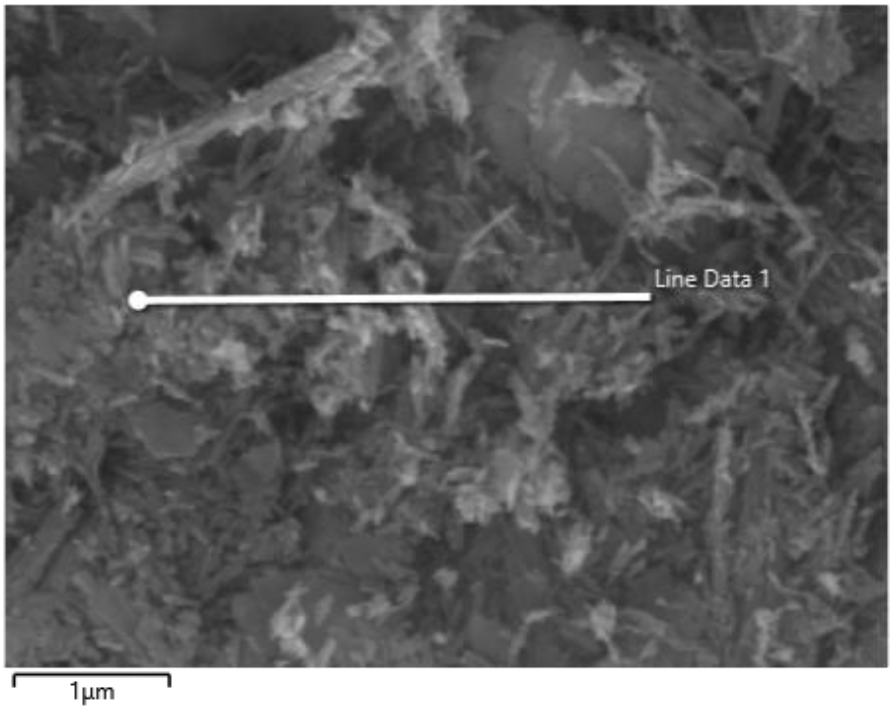
Figures

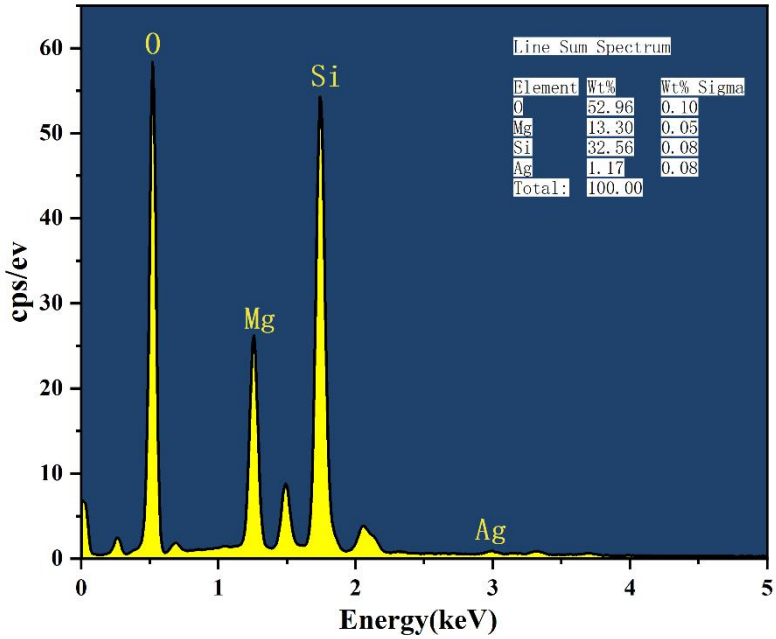


S1 HRTEM image of Sep/Ag composite

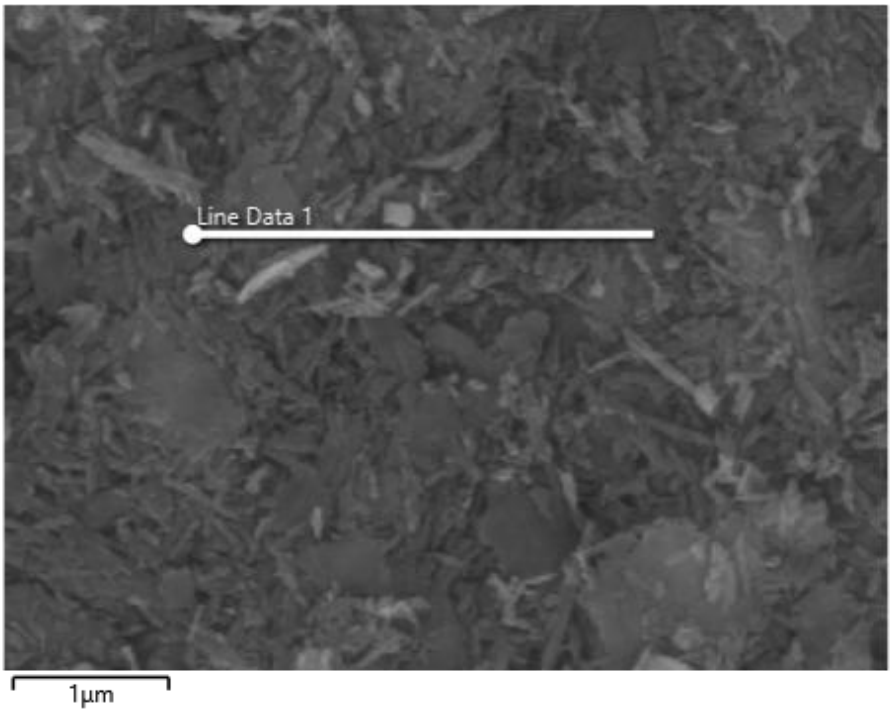


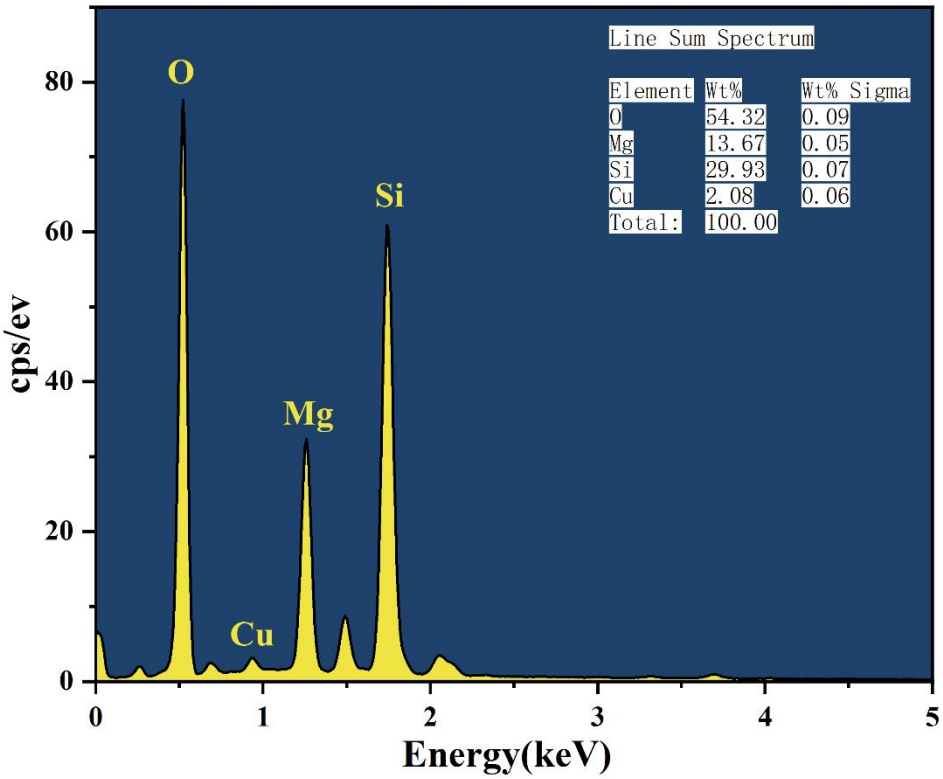
S2 TEM particle size analysis plot



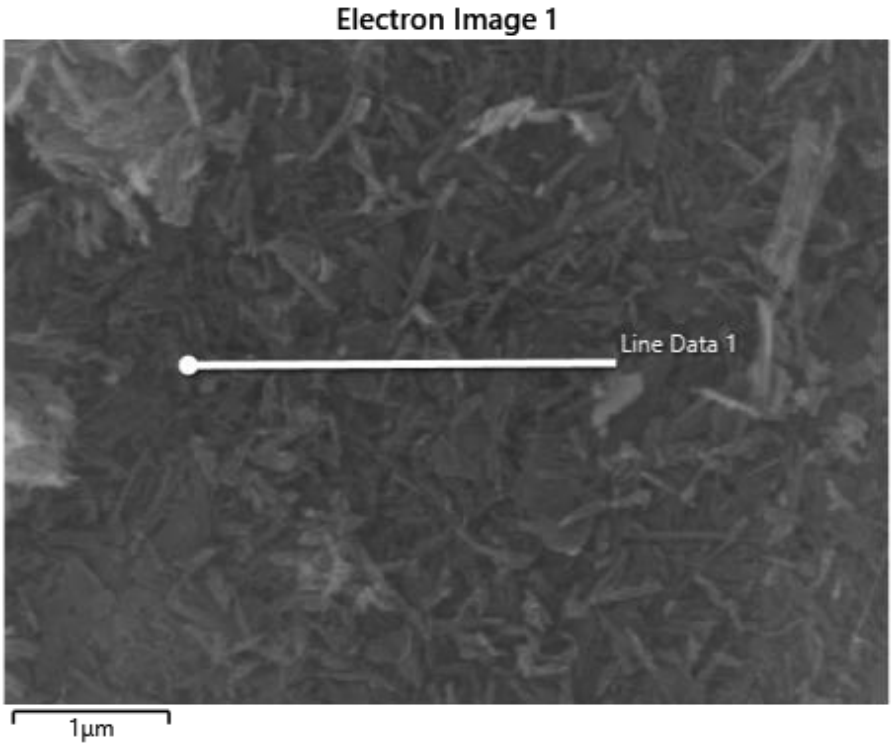


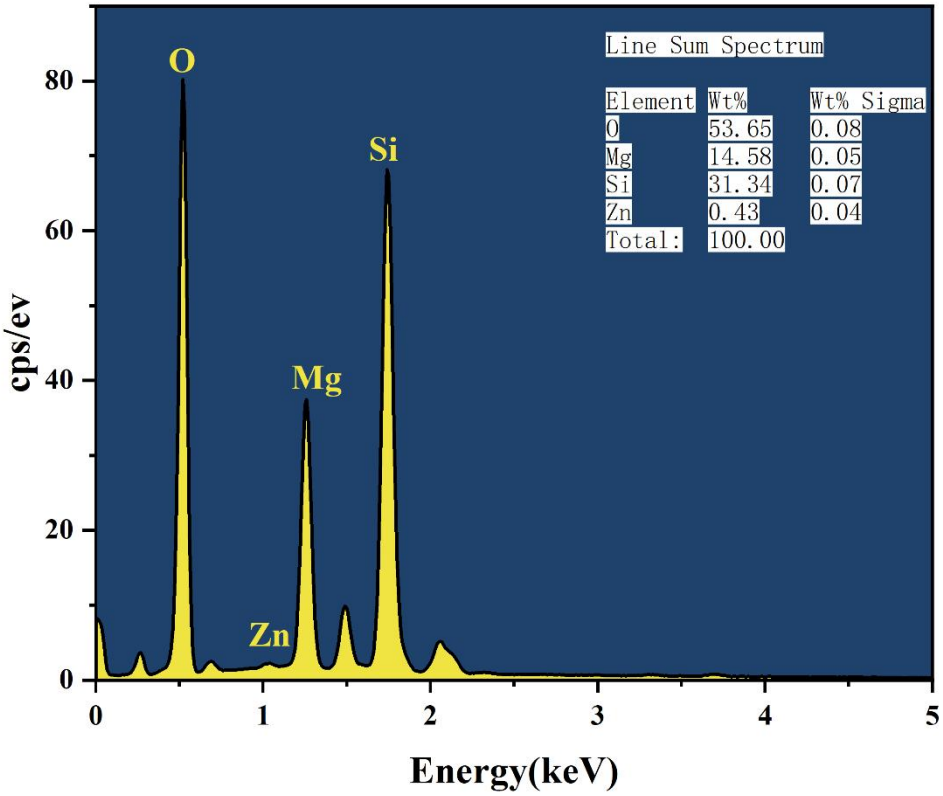
S3 Diagram of Sep/Ag EDS test



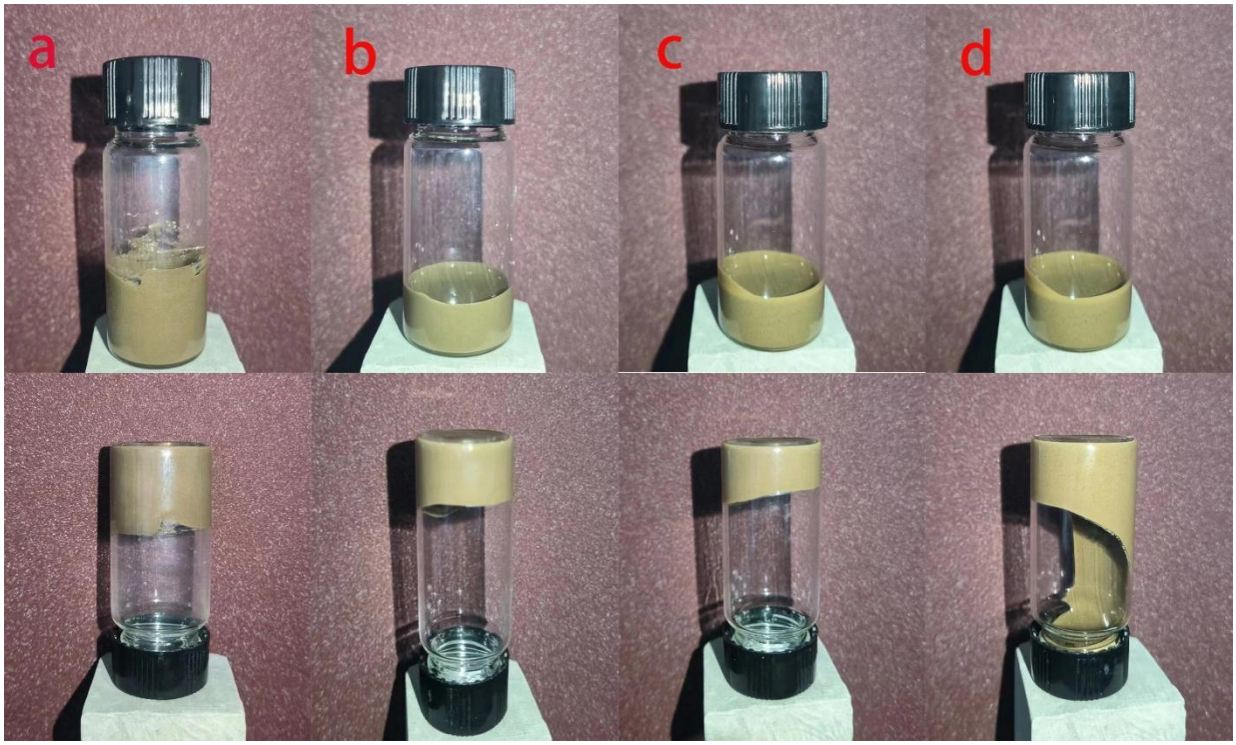


S4 Diagram of Sep/CuO EDS test





S5 Diagram of Sep/ZnO EDS test



S6 Workability of the Sep/CuO composite as medicated dressings. Mass ratio of composite/water: (a) 5:9; (b) 5:10; (c) 5:11; (d) 5:12.