

Supporting Information

Photocatalytic TiO₂/HAP Nanocomposite for Antimicrobial Treatment, Promineralization, and Tooth Whitening

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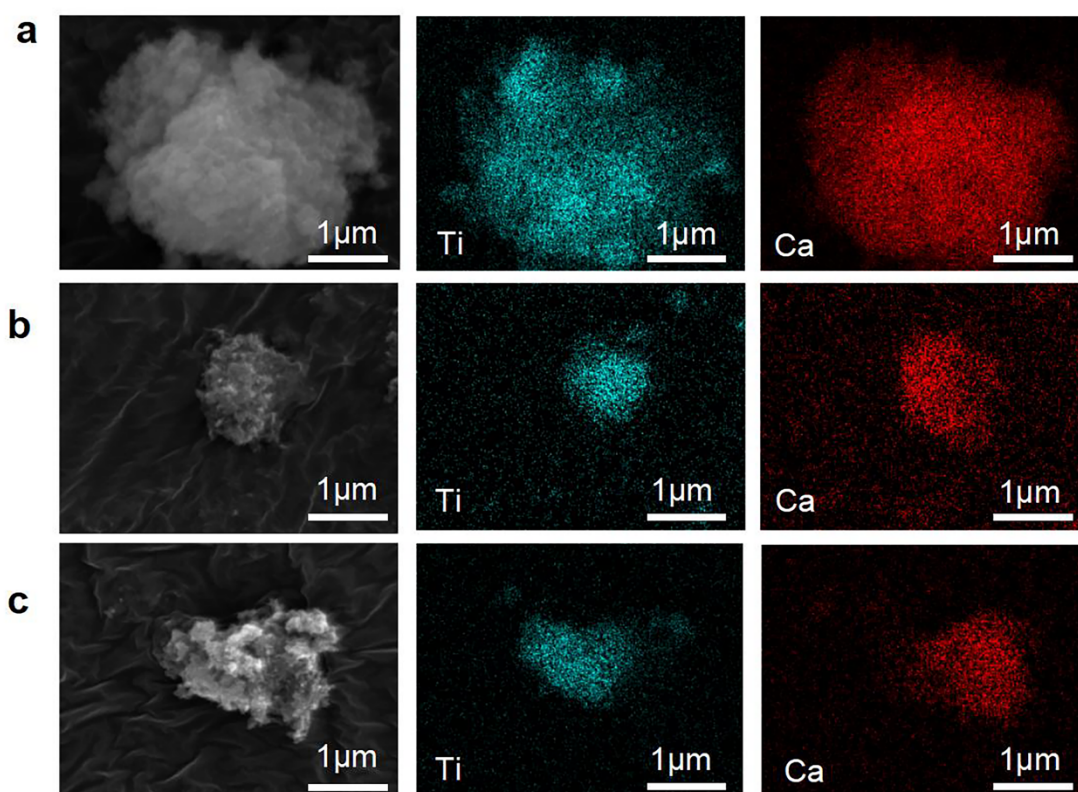


Fig. S1 SEM images and elemental analysis of TiO_2/HAP nanocomposites with titanium-to-calcium molar ratio of (a) 1:2, (b) 1:1, (c) 2:1.

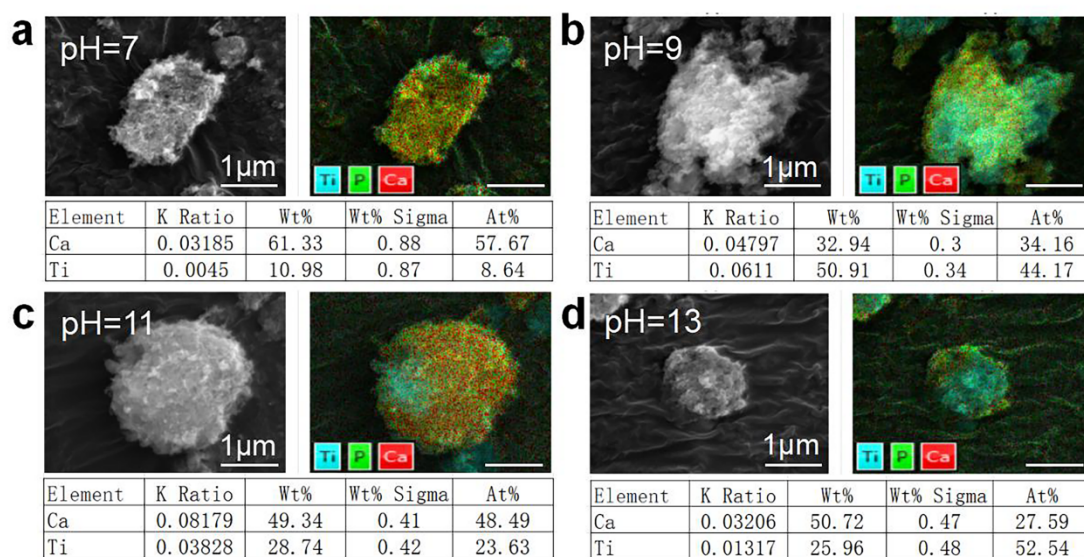


Fig. S2 SEM and EDS of TiO_2 -HAP composites with different pH values. (a)pH=7, (b)pH=9, (c)pH=11, (d)pH=13.

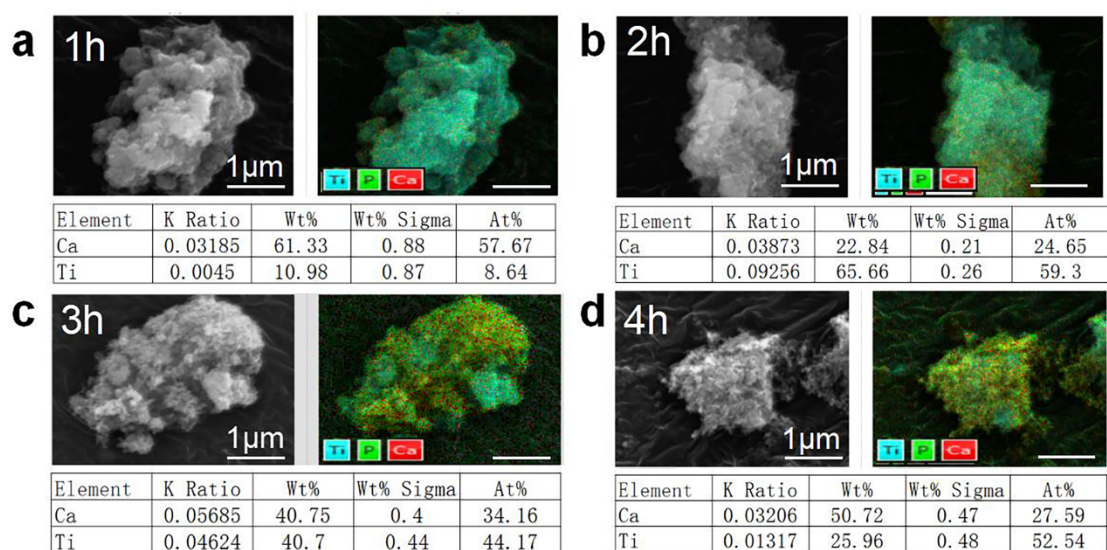


Fig. S3 SEM and EDS of TiO_2 -HAP composites with different stirring times during synthesis. (a) 1 h, (b) 2 h, (c) 3 h, (d) 4 h.

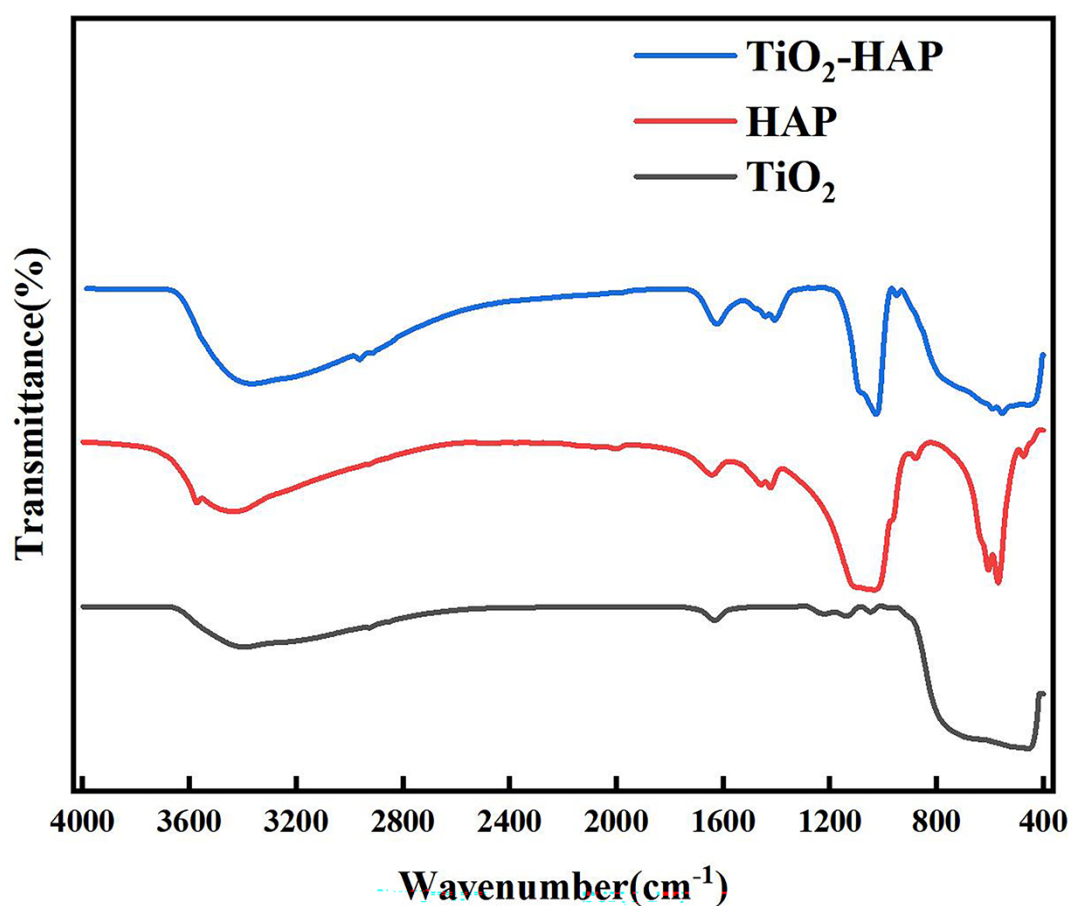


Fig. S4 FTIR results of TiO_2 -HAP, HAP, and TiO_2 .

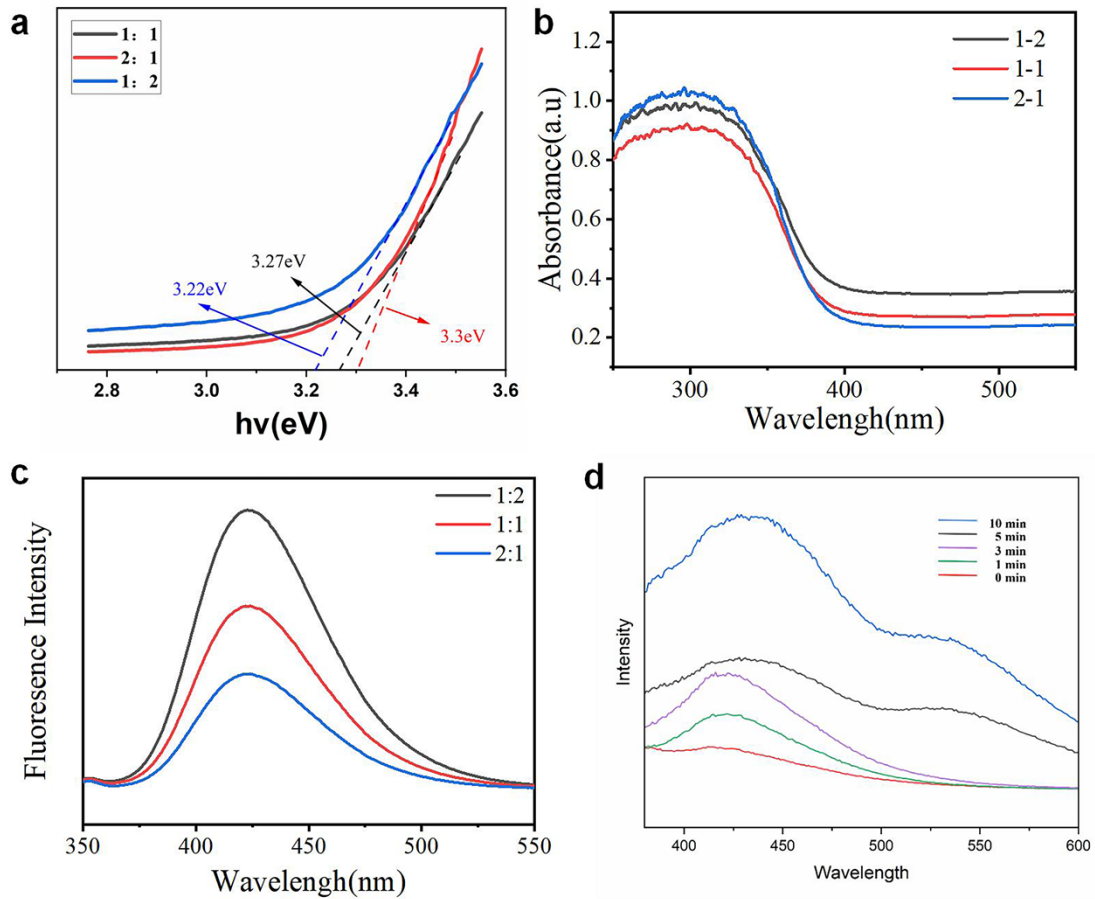


Fig. S5 Hydroxyl radicals tests of TiO_2 -HAP. (a) The band gap of TiO_2 -HAP from Tauc's plot. (b) UV-Vis absorption spectra. (c) Fluorescence intensity of $\cdot\text{OH}$. (d) Time-resolved $\cdot\text{OH}$ quantification via TA probe.

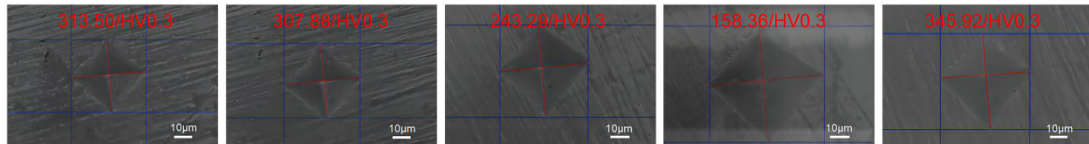


Fig. S6 The measured value from a specific microhardness testing. (a) TiO_2 -HAP group, (b) TiO_2 -HAP + LED group, (c) NaF group, (d) Untreated enamel group, (e) Demineralized enamel group.

Table 1 Microhardness testing results of enamel (HV, $\bar{X} \pm S$).

Groups	n	SMH	F	P
TiO_2 -HAP group	10	318.89 $\pm$ 8.86	385.04	<0.001
TiO_2 -HAP + LED group	10	318.93 $\pm$ 11.56		
NaF group	10	249.39 $\pm$ 13.96		
Untreated enamel group	10	344.57 $\pm$ 5.52		
Demineralized enamel group	10	156.08 $\pm$ 16.82		

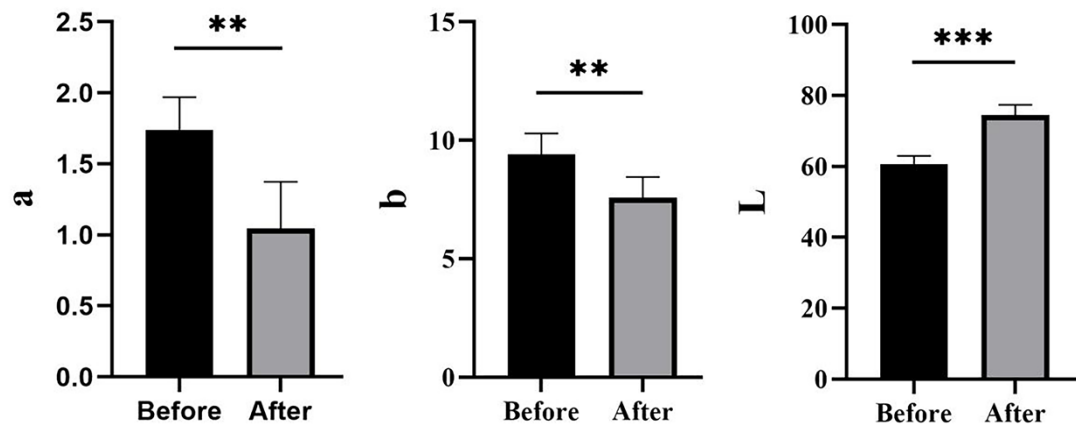


Fig. S7 CIELAB values for teeth whitening

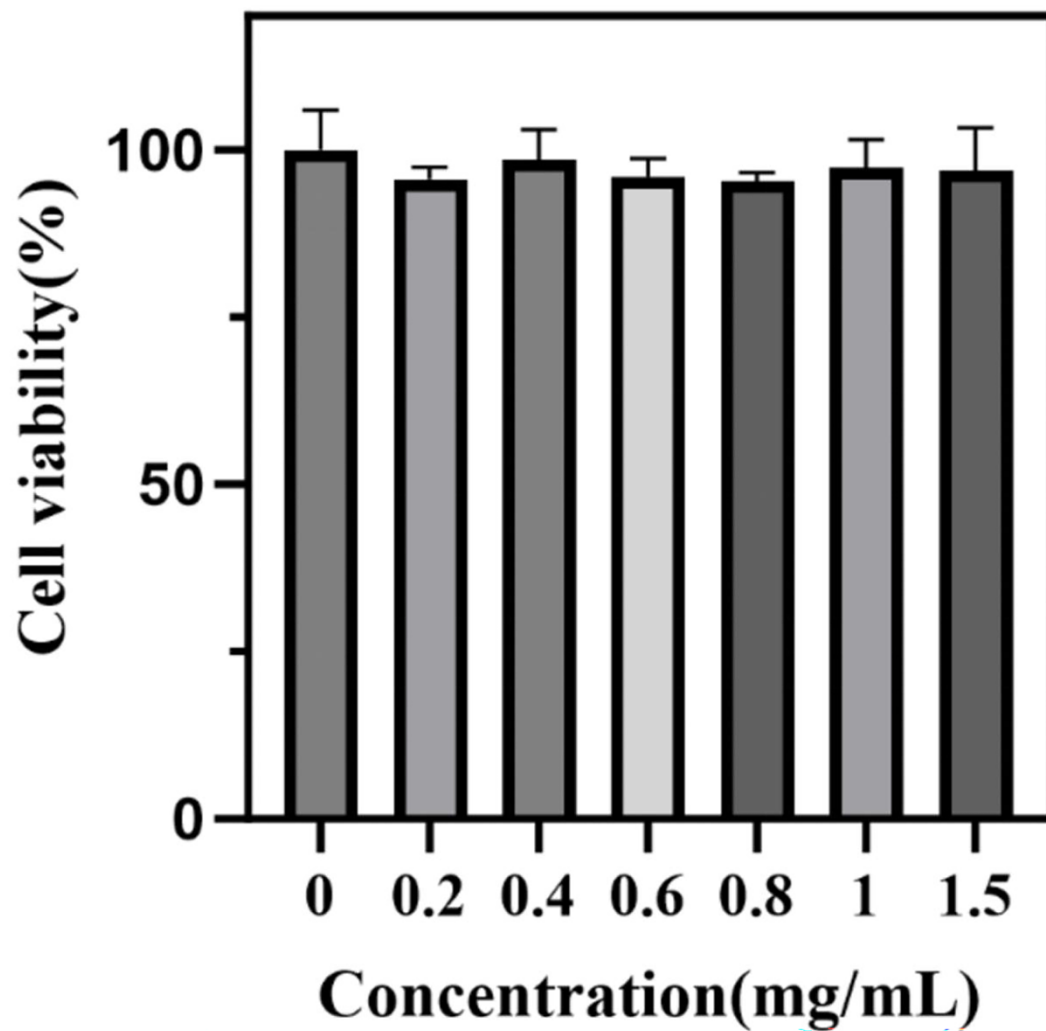


Fig. S8 Cytotoxicity results of TiO_2 -HAP at different concentrations.

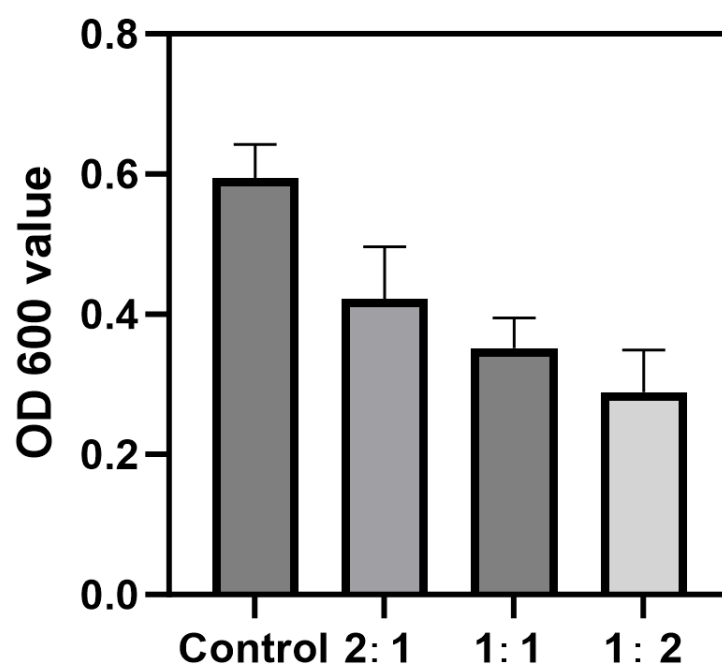


Fig. S9 Antibacterial effect of TiO_2 -HAP with different titanium-calcium molar ratios.

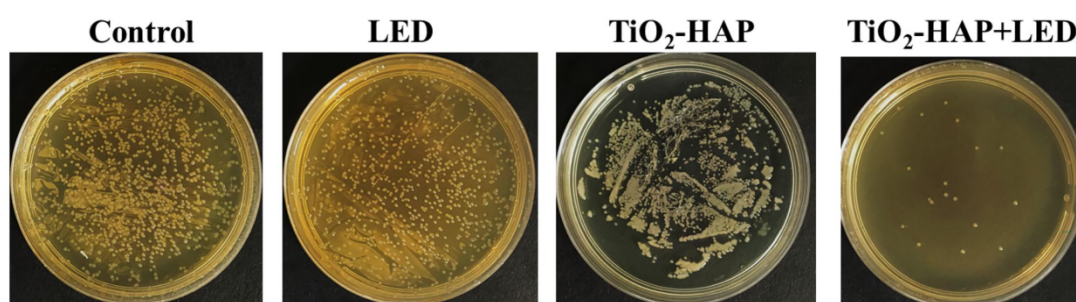


Fig. S10 Image of bacterial plating on petri dishes.



Fig. S11 Colony image of *S. mutans*