

Supplementary Information

Effect of temperature on the adhesion and sterilization effect of Ag⁺- doped BiVO₄ ceramic tiles

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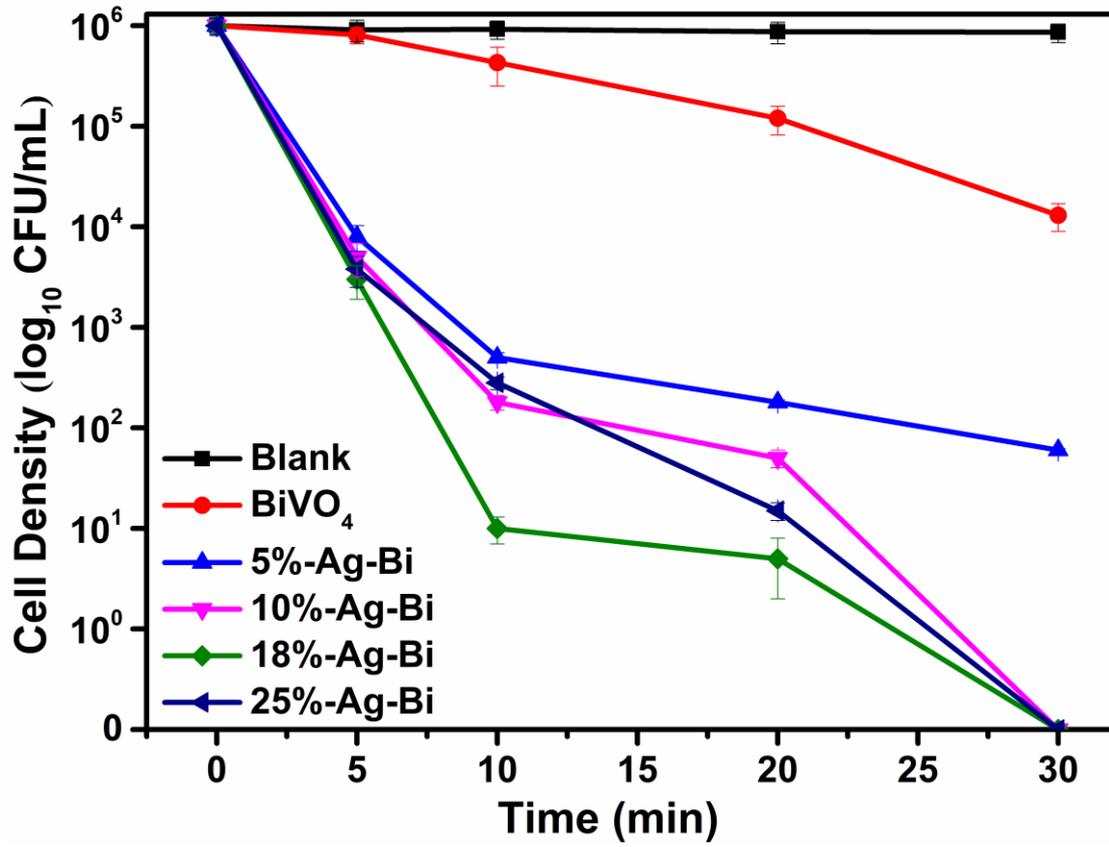


Figure S1. The effect of Ag dosage on the sterilization effect of Ag/BiVO₄ obtained at 450 °C (bacterial suspension concentration: 1×10⁶ CFU/mL; bacterial species: *Escherichia coli*; common anions: 0.9% Cl⁻).

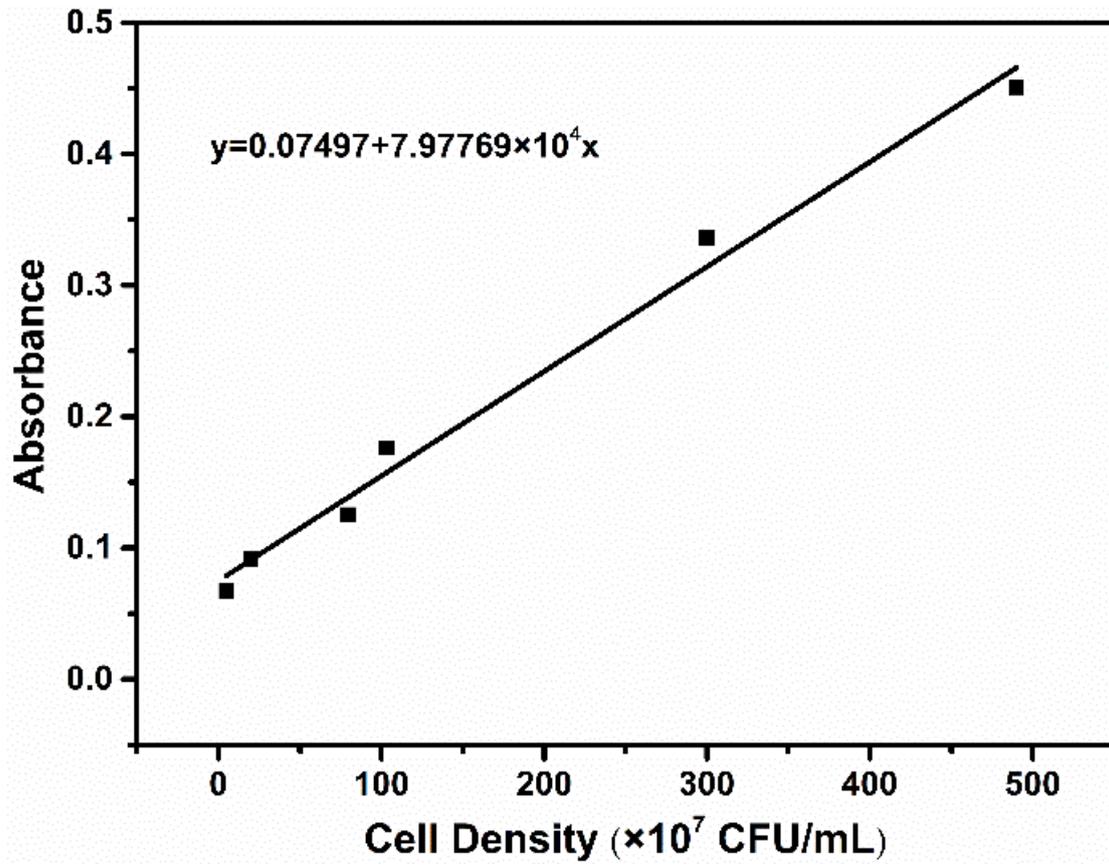


Figure S2. Standard curve of bacteria suspension concentration vs. absorbance

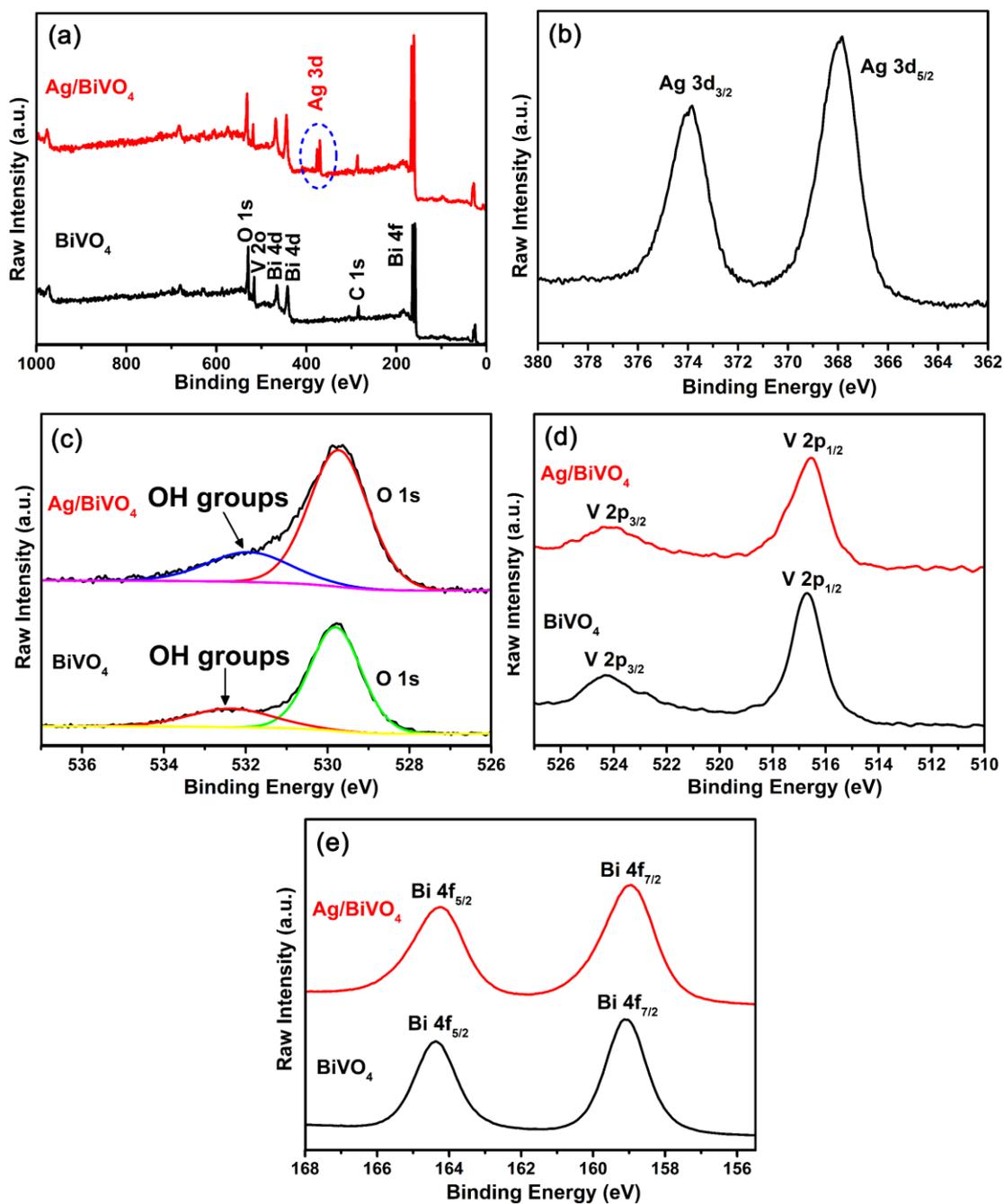


Figure S3. XPS spectra of BiVO₄ and Ag/BiVO₄ powder (prepared temperature: 450 °C). (a) Full-scan spectra of BiVO₄ and Ag/BiVO₄; (b-e) peak positions of Ag, O, V, and Bi species.

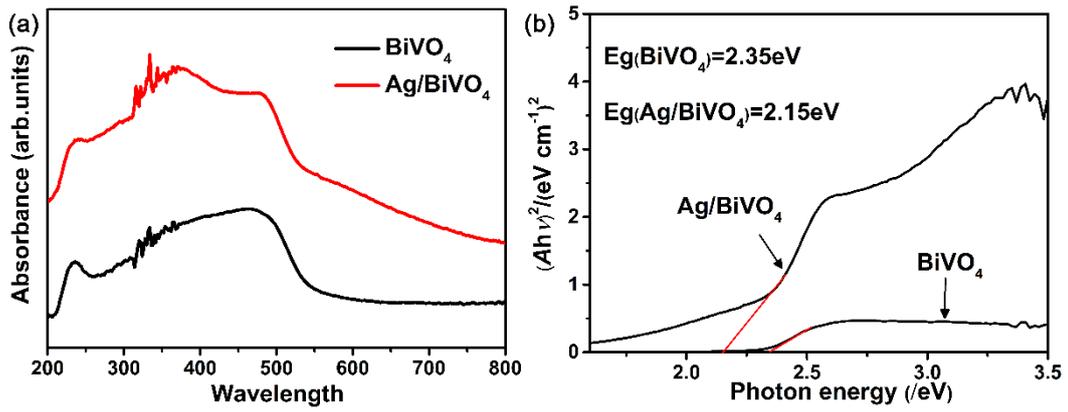


Figure S4. (a) UV-Vis spectra of the samples (prepared temperature: 450 °C); (b) Band gap widths of the samples (prepared temperature: 450 °C).

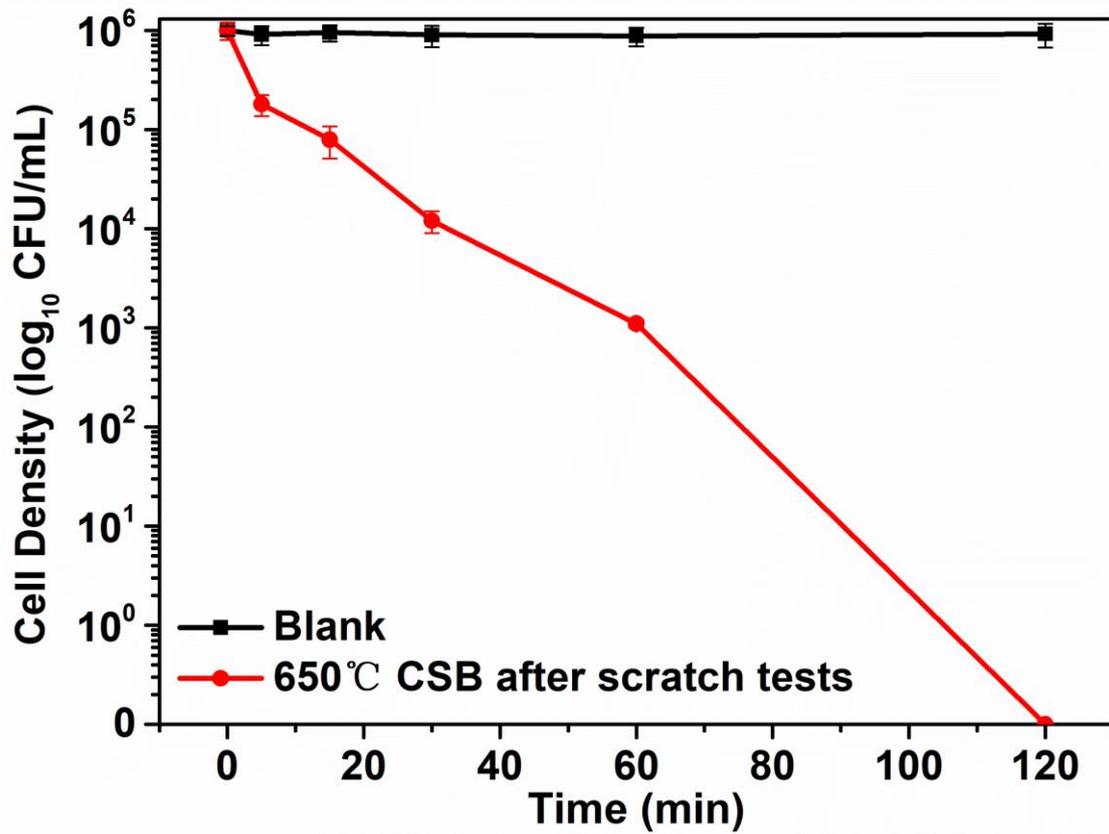


Figure S5 *Escherichia coli* sterilization efficiency of Ag/BiVO₄ ceramic tiles after scratch tests (bacterial suspension concentration: 1×10^6 CFU/mL; common anions: 0.9% Cl⁻).

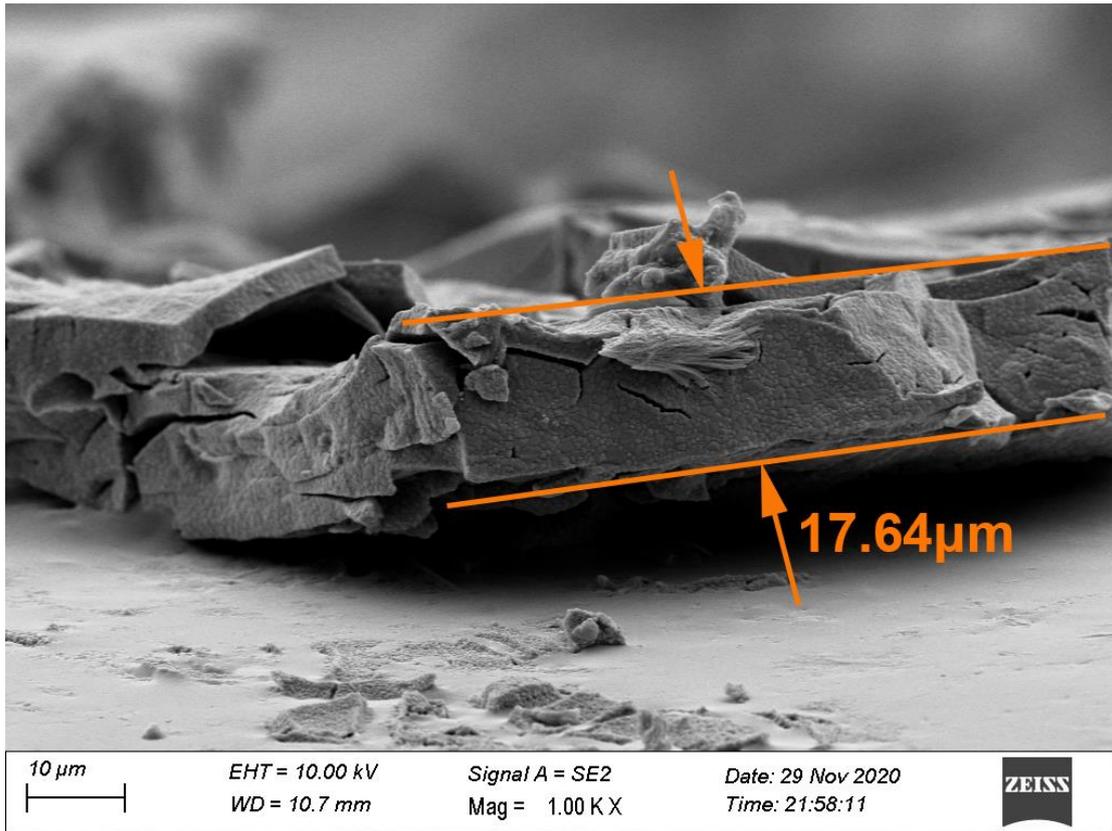


Figure S6. SEM cross section image of Ag/BiVO₄ coating obtained at 650 °C.

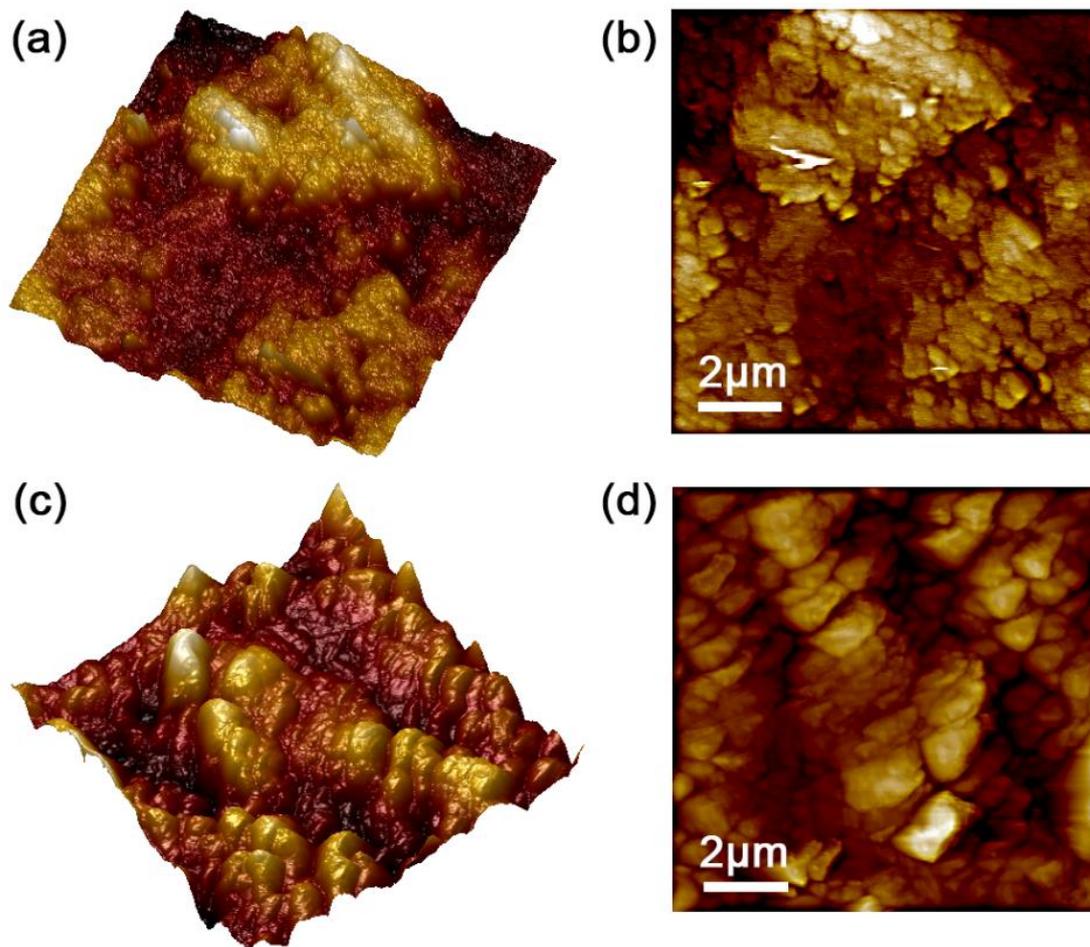


Figure S7. AFM images of (a-b) BiVO₄ and (c-d) Ag/BiVO₄ functionalized ceramic tiles annealed at 450 °C.

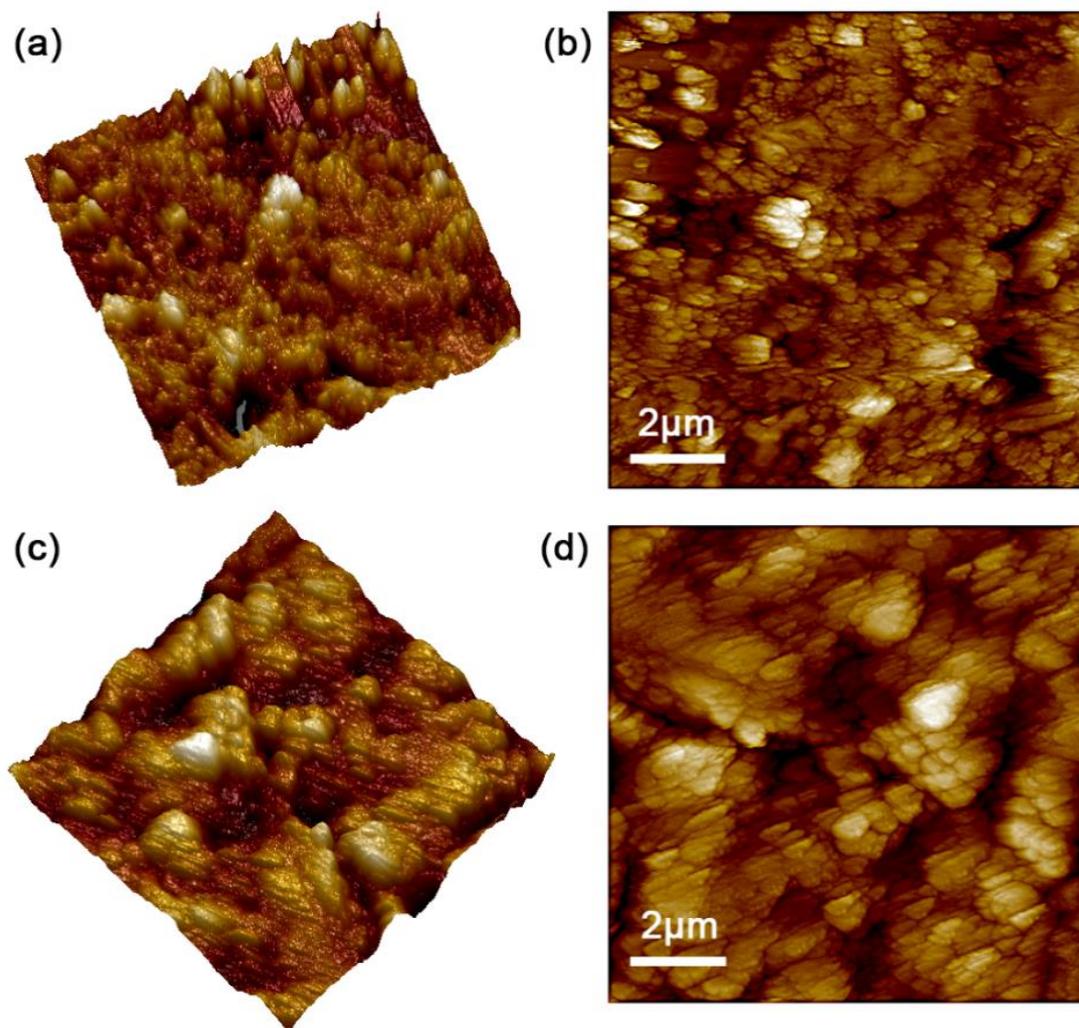


Figure S8. AFM images of (a-b) BiVO₄ and (c-d) Ag/BiVO₄ functionalized ceramic tiles annealed at 550 °C.

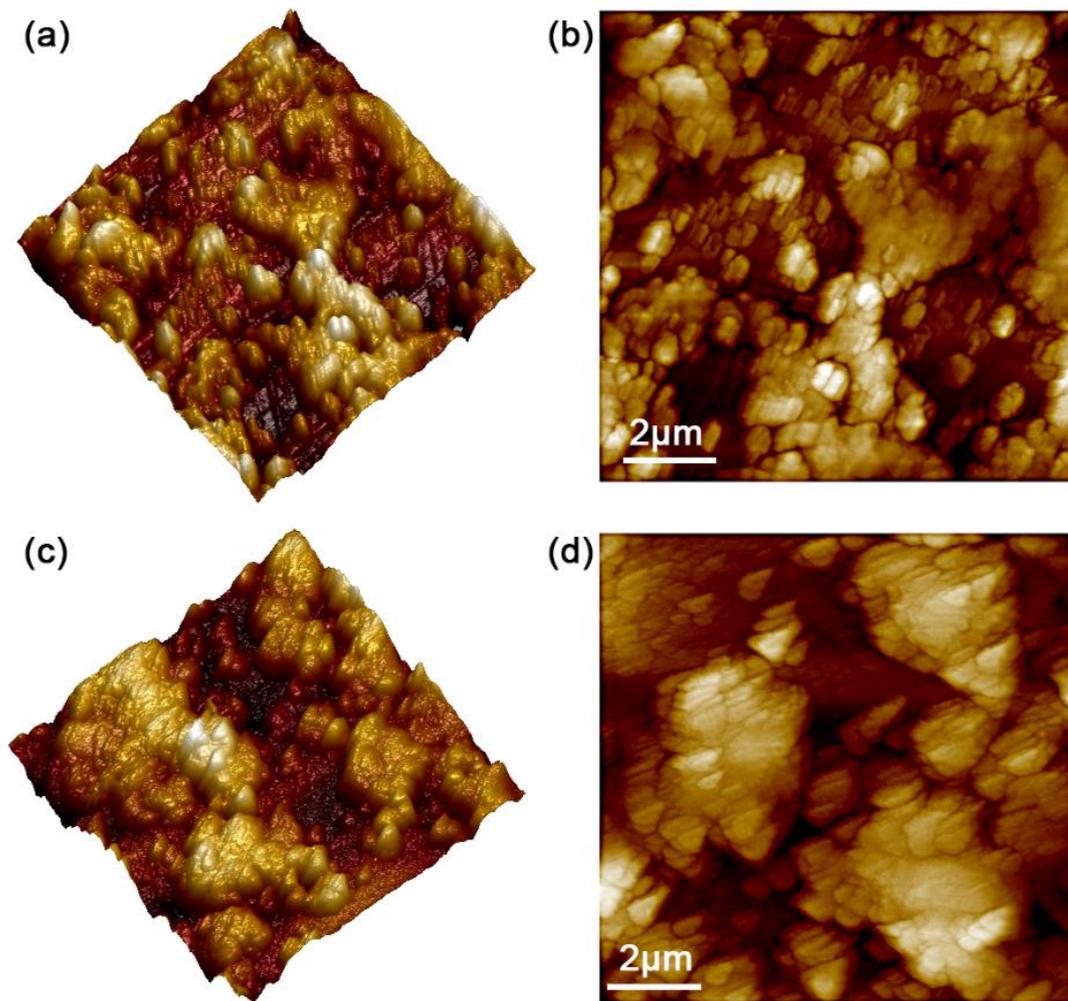


Figure S9. AFM images of (a-b) BiVO₄ and (c-d) AFM images of Ag/BiVO₄ functionalized ceramic tiles annealed at 650 °C.

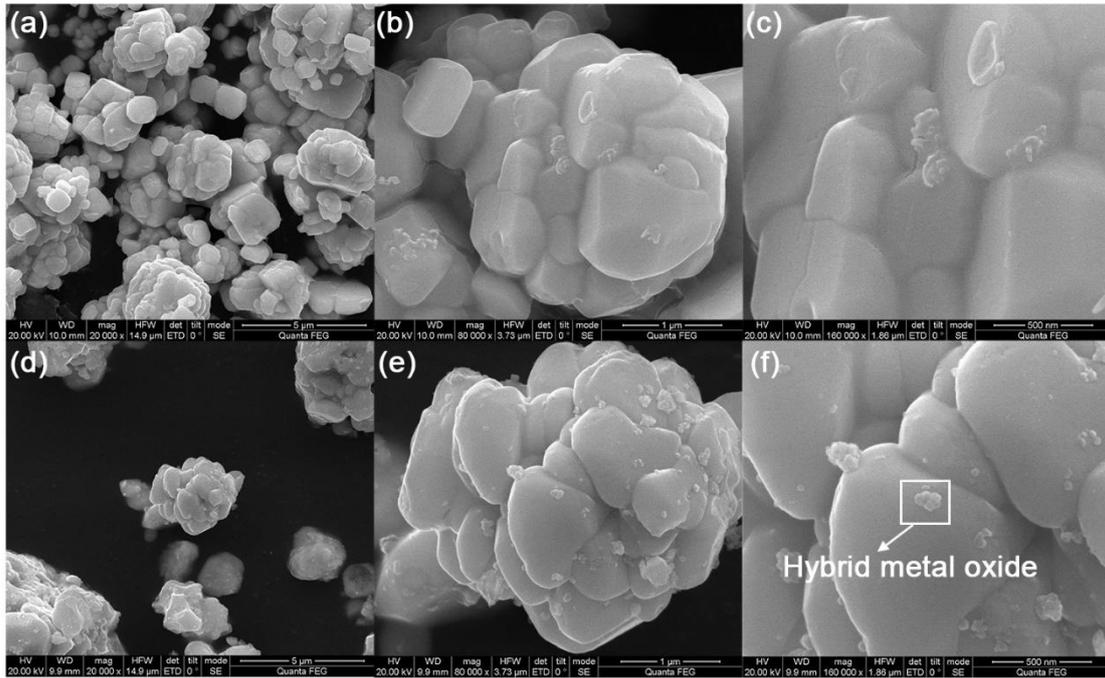


Figure S10. (a-c) SEM images of BiVO₄ and (d-f) Ag/BiVO₄ powders at 450°C

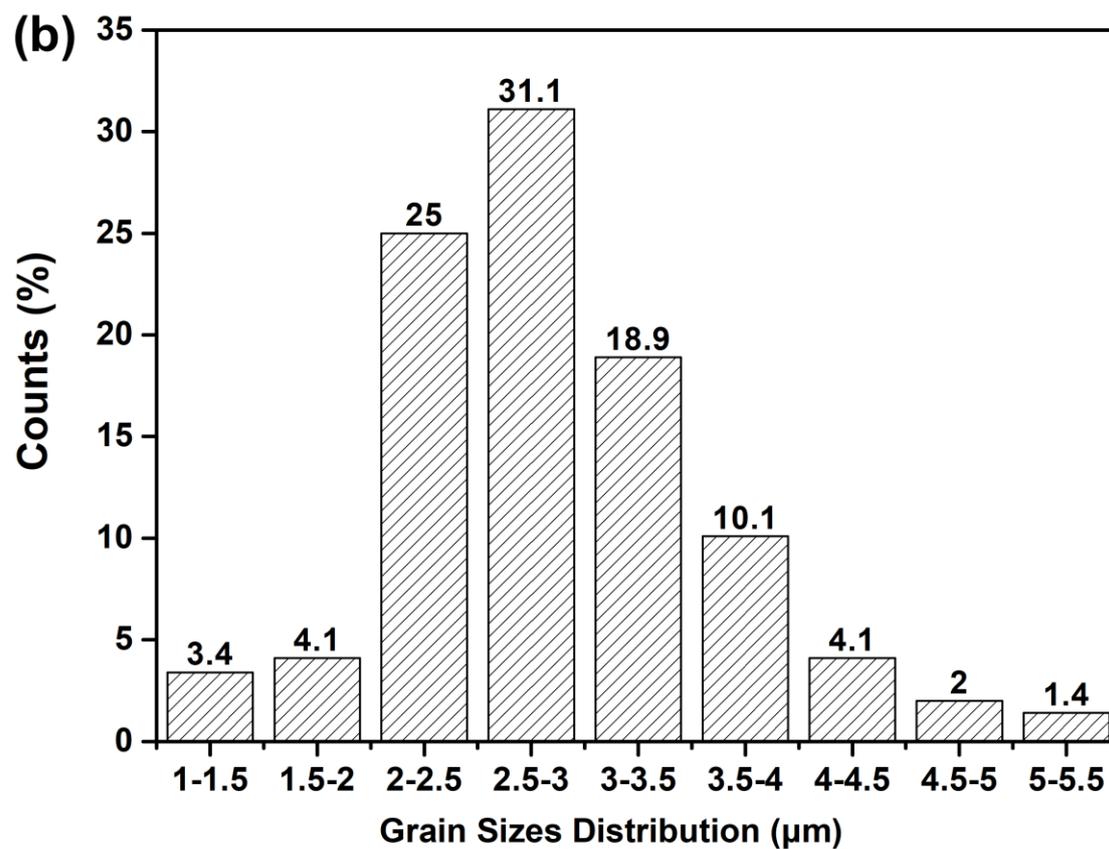
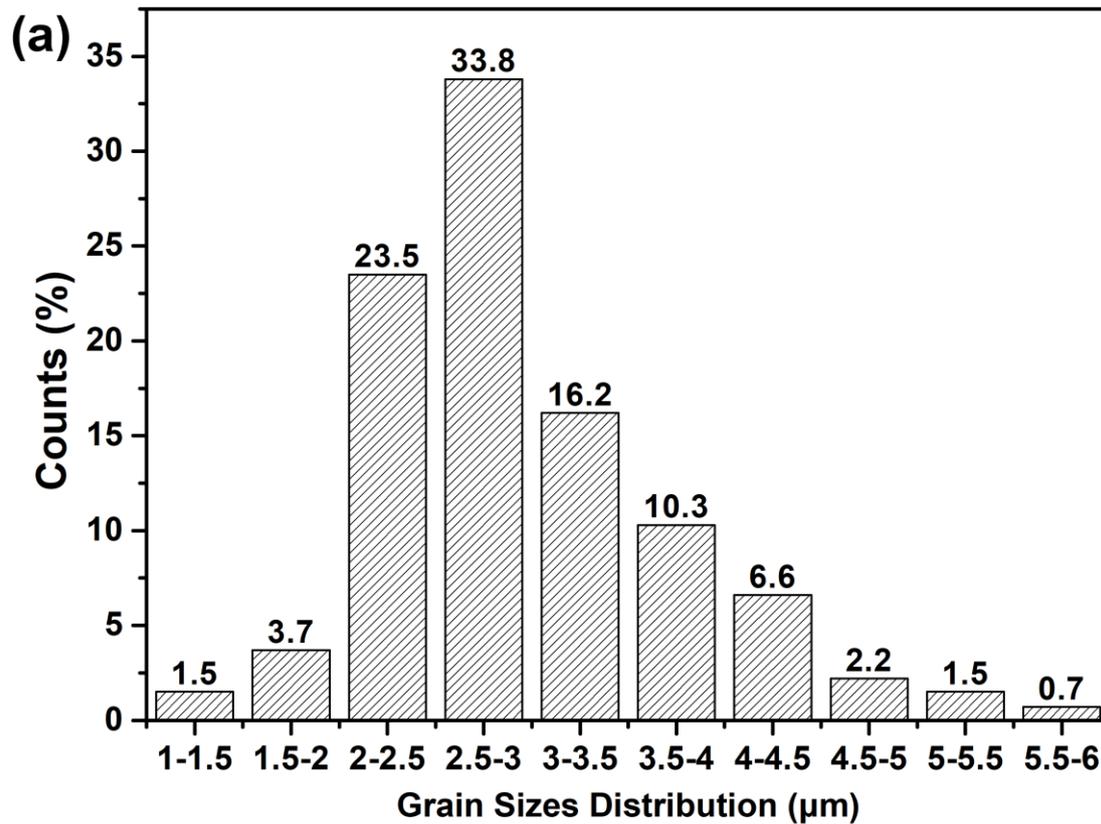


Figure S11. Grain sizes distribution of BiVO_4 and (a) Ag/BiVO_4 (b) powder obtained at 450°C

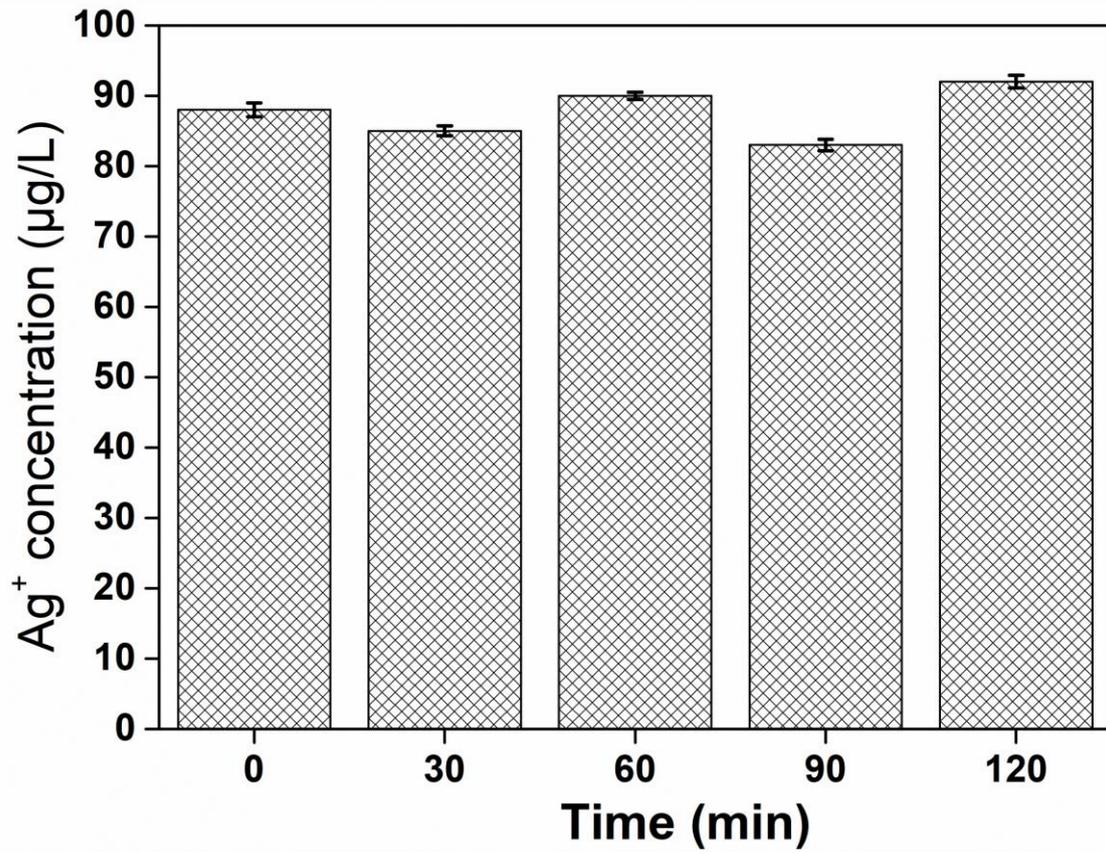


Figure S12. Concentration of released Ag^+ from of Ag/BiVO_4 functionalized ceramic tiles annealed at $650\text{ }^\circ\text{C}$.

Table S1 The basic characteristics of glazed ceramic tiles (model number: 630ELN52005-A)

| Technical parameter | Unit | Value |
|---|--------------------|-----------------|
| Nominal size | mm | 600×300 |
| Thickness | mm | 10±0.3 |
| Water absorption | % | 5 |
| Breakage pressure | N | 1144 |
| Modulus of rupture | MPa | 23 |
| Moisture expansion | mm/m | 0.19 |
| The amount of dissolved lead (Detection limit: 0.005 mg/dm ²) | mg/dm ² | Not detected |
| The amount of dissolved cadmium (Detection limit: 0.003 mg/dm ²) | mg/dm ² | Not detected |
| Surface flatness | / | -0.05% ~ +0.04% |

