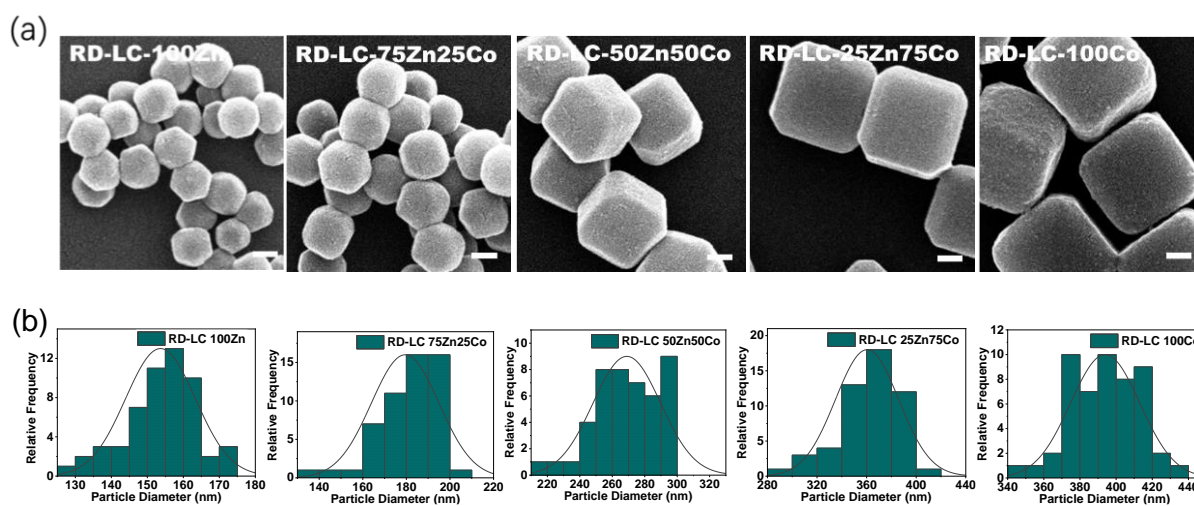
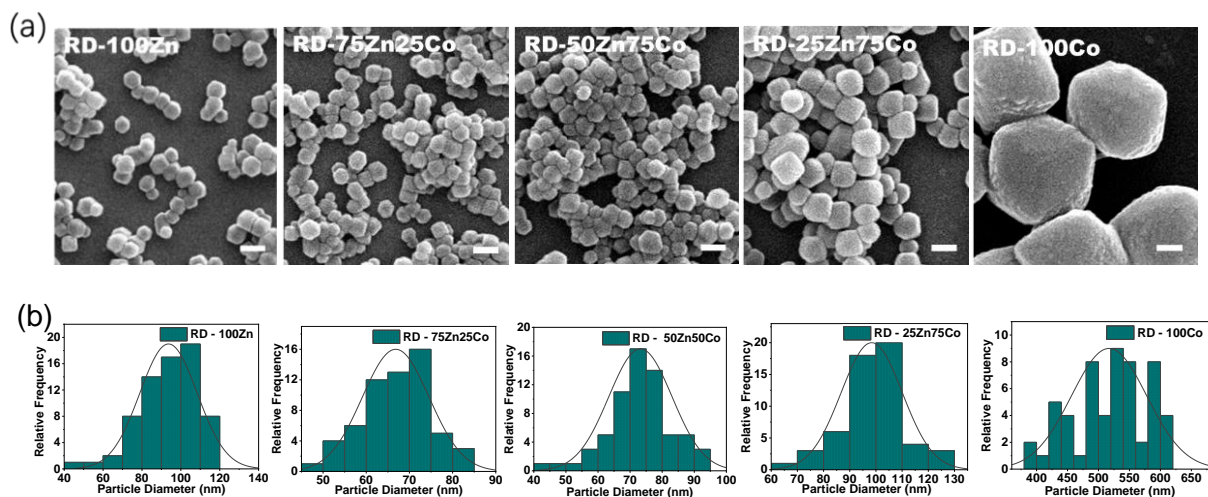


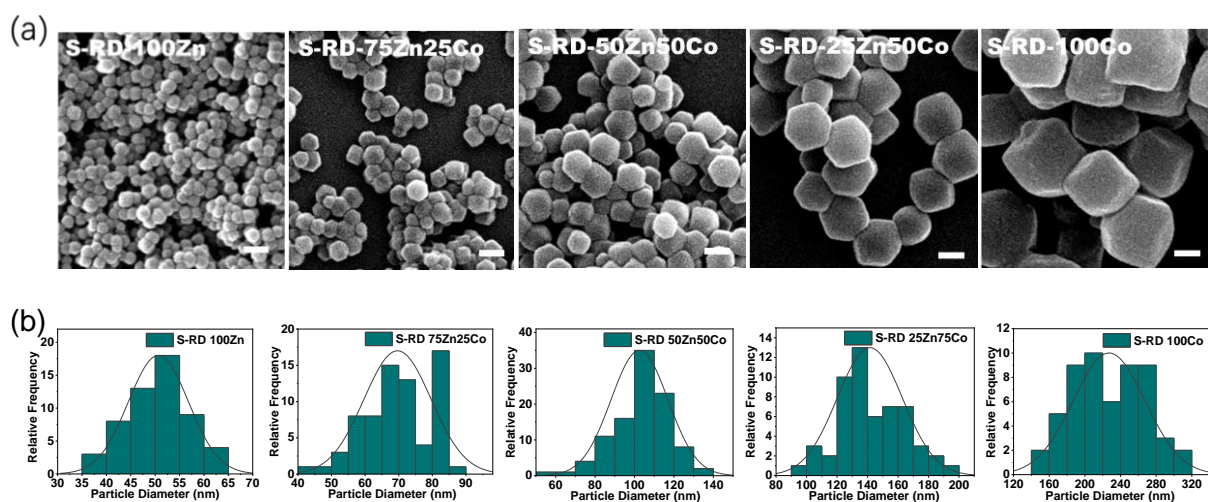
**Figure S1** (a) SEM images and (b) particle size distribution graphs of large cubes. Scale bars, 100 nm.



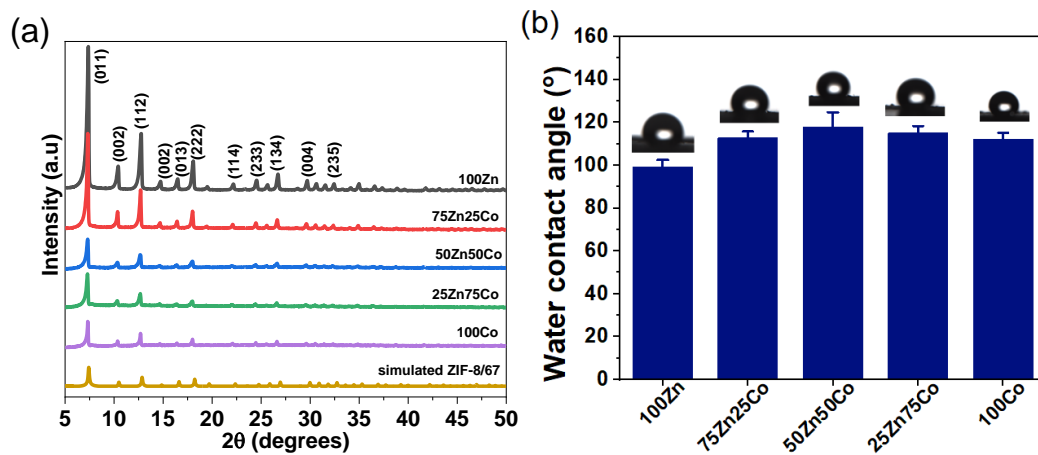
**Figure S2** (a) SEM images and (b) particle size distribution graphs of rhombic dodecahedron - large cubes. Scale bars, 100 nm.



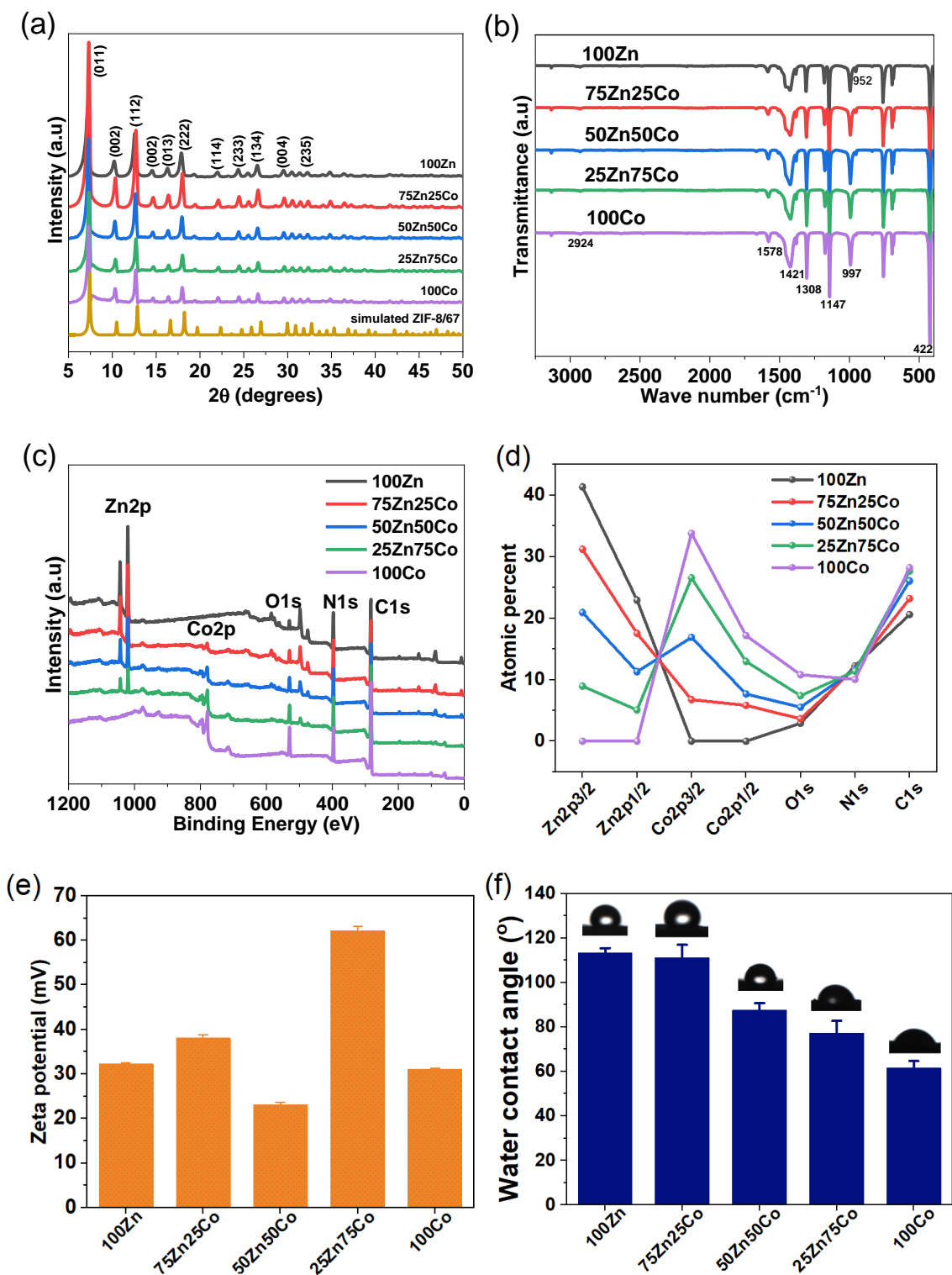
**Figure S3** (a) SEM and (b) particle size distribution of rhombic dodecahedron. Scale bars, 100 nm.



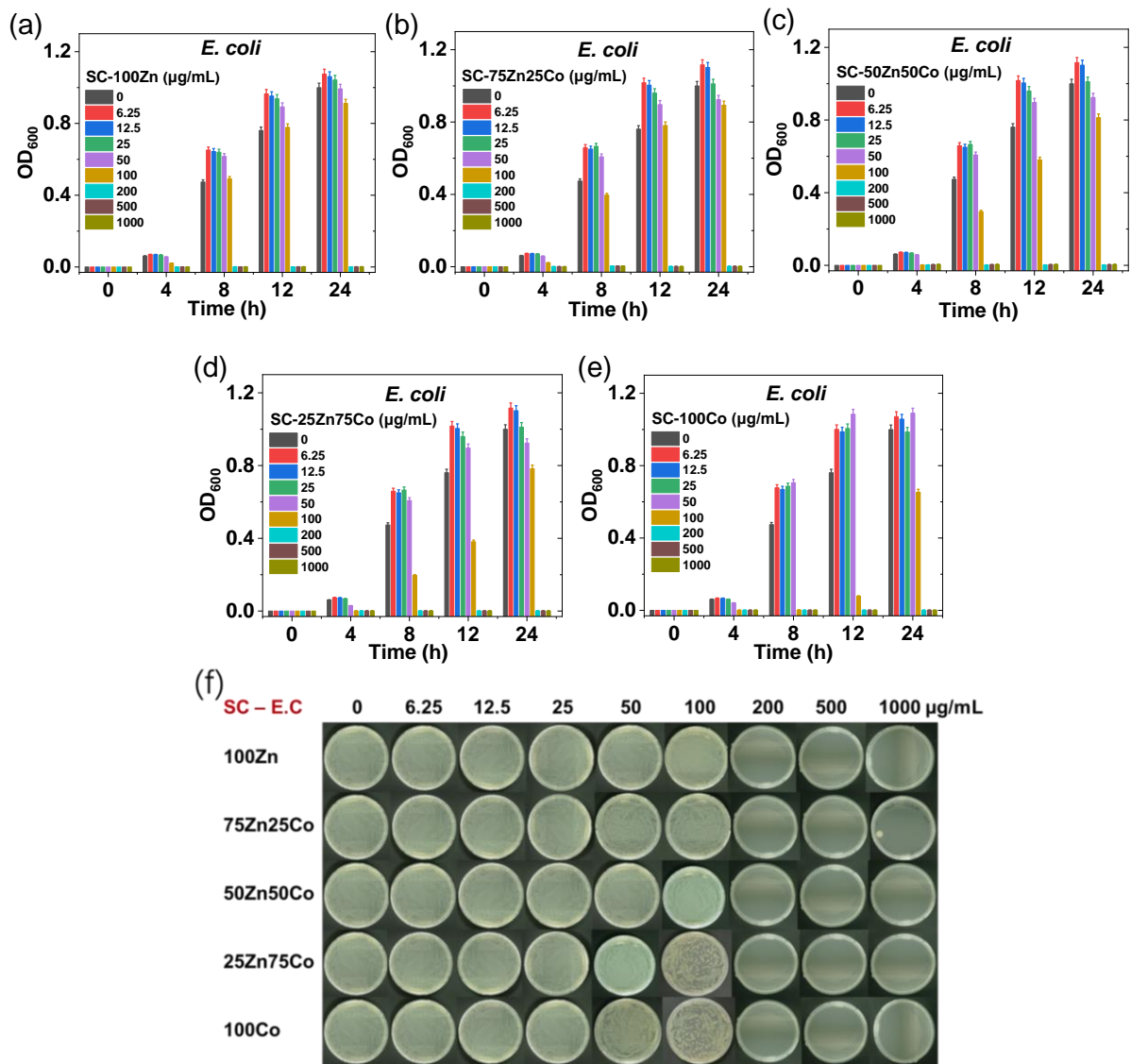
**Figure S4** (a) SEM images and (b) particle size distribution graphs of spherical - rhombic dodecahedron. Scale bars, 100 nm.



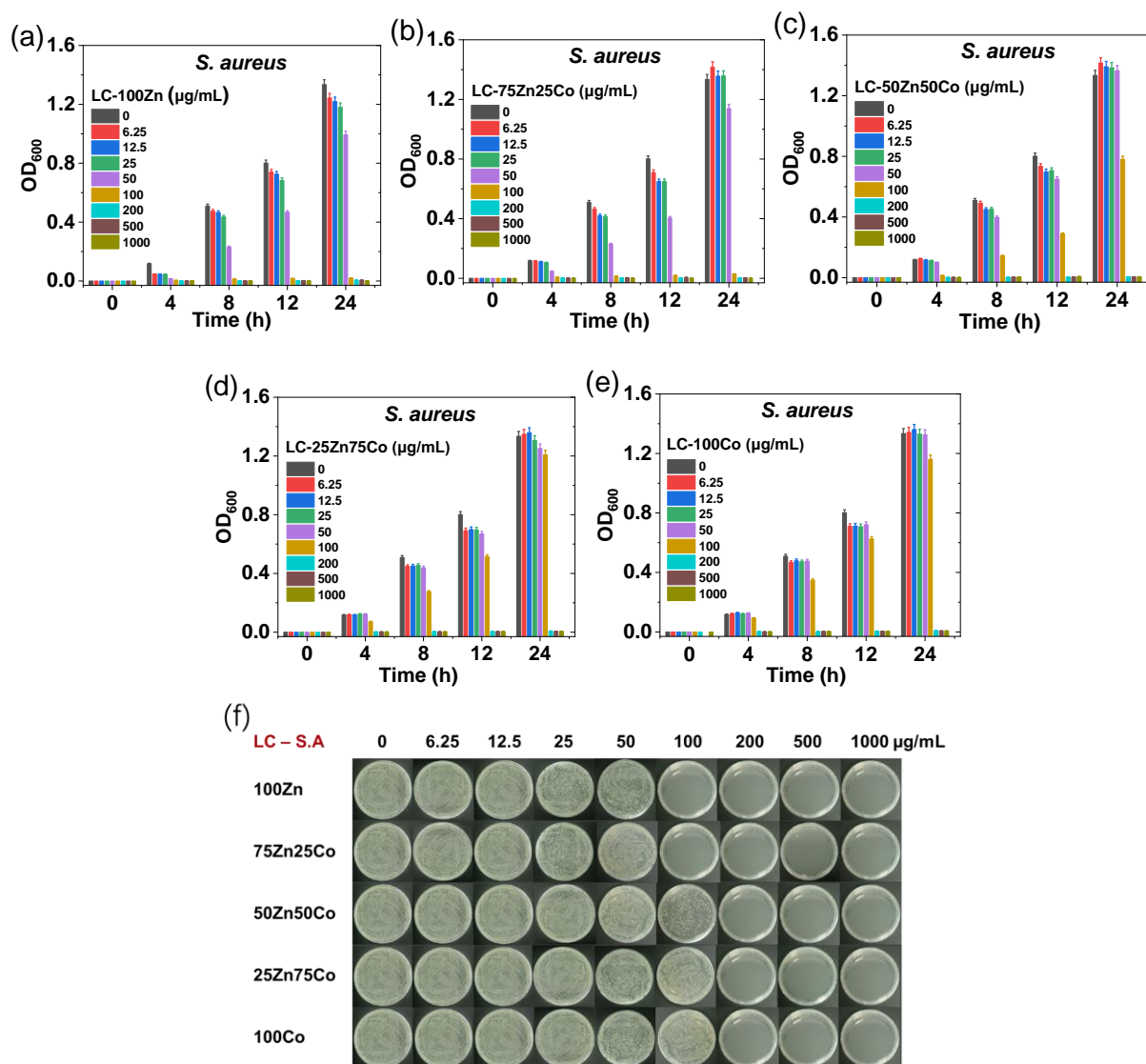
**Figure S5** (a) XRD patterns and (b) Water contact angles of large cubes.



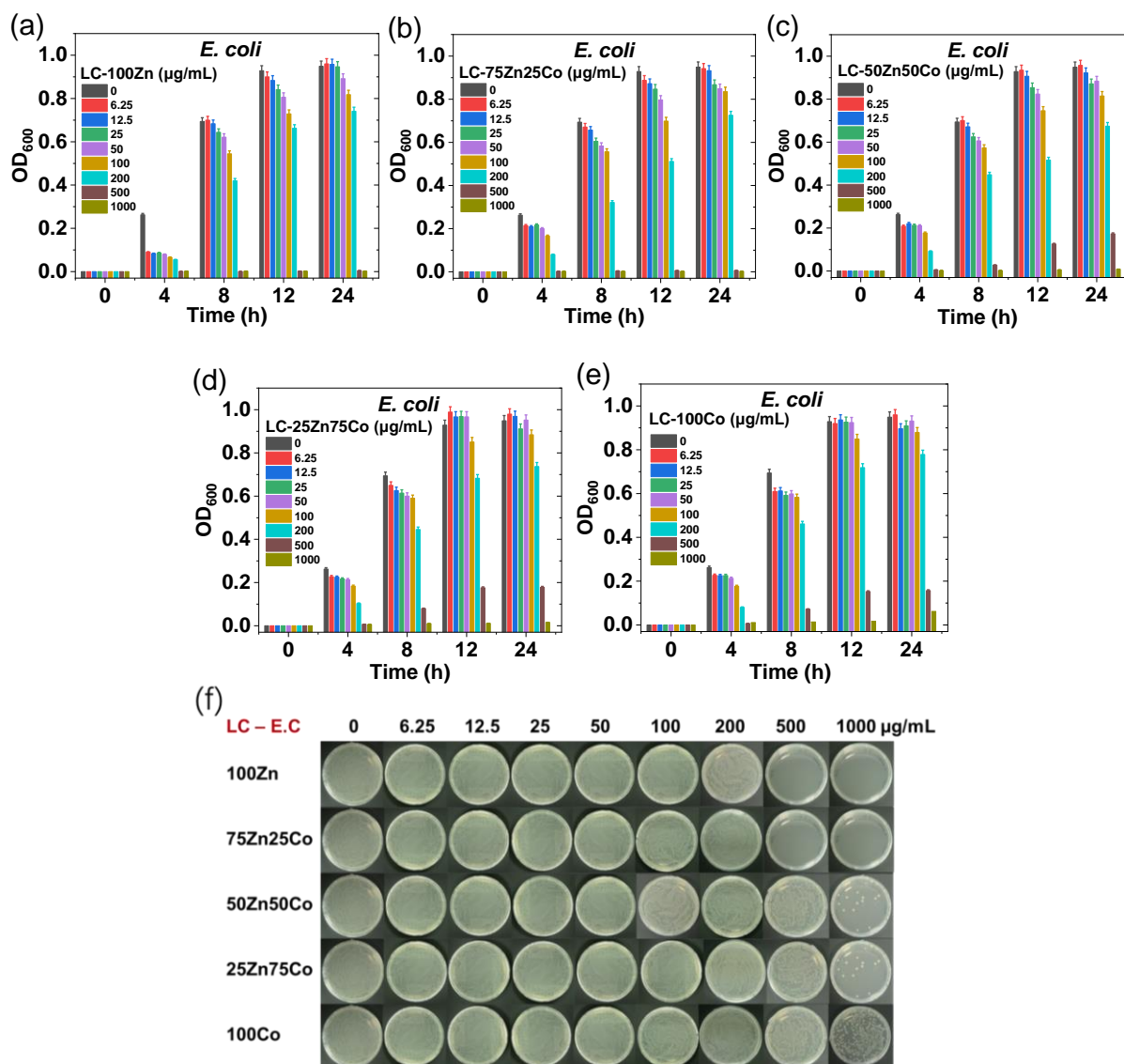
**Figure S6** (a) XRD patterns, (b) FT-IR absorption spectra, (c) XPS survey spectra, (d) Atomic percent of various orbital levels extracted from XPS spectra, (e) Zeta potentials, and (f) Water contact angles of spherical - rhombic dodecahedron group.



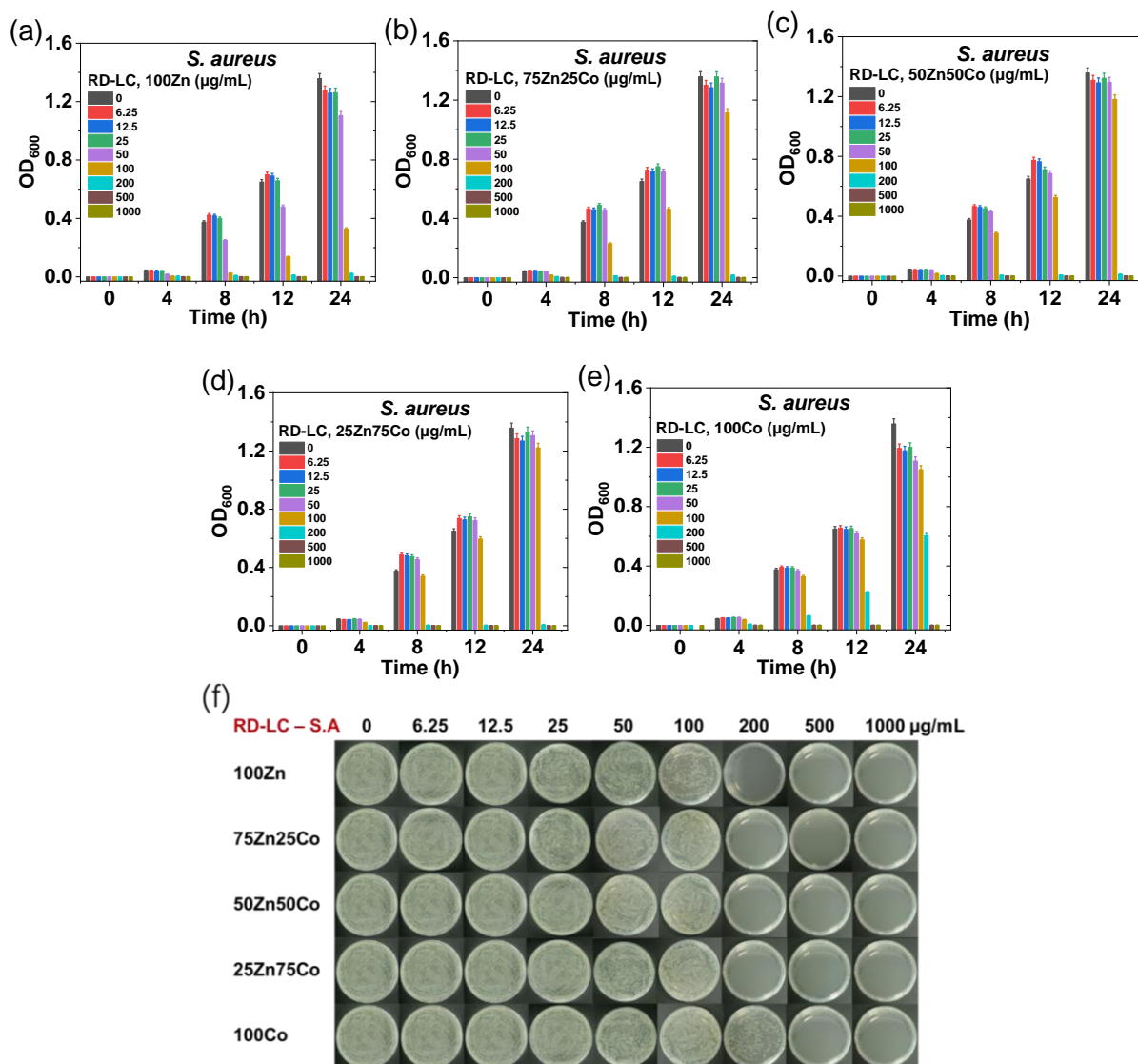
**Figure S7** Bacterial cell viability of *E. coli* measured at various time intervals after being exposed to different concentrations of (a) SC-100Zn, (b) SC-75Zn25Co, (c) SC-50Zn50Co, (d) SC-25Zn75Co, and (e) SC-100Co. (f) Corresponding photographs of bacterial colony with different treatments in agar plates. Data are provided as the mean  $\pm$  SD, n = 3.



**Figure S8** Bacterial cell viability of *S. aureus* measured at various time intervals after being exposed to different concentrations of (a) LC-100Zn, (b) LC-75Zn25Co, (c) LC-50Zn50Co, (d) LC-25Zn75Co, and (e) LC-100Co. (f) Corresponding photographs of bacterial colony with different treatments in agar plates. Data are provided as the mean  $\pm$  SD, n = 3.

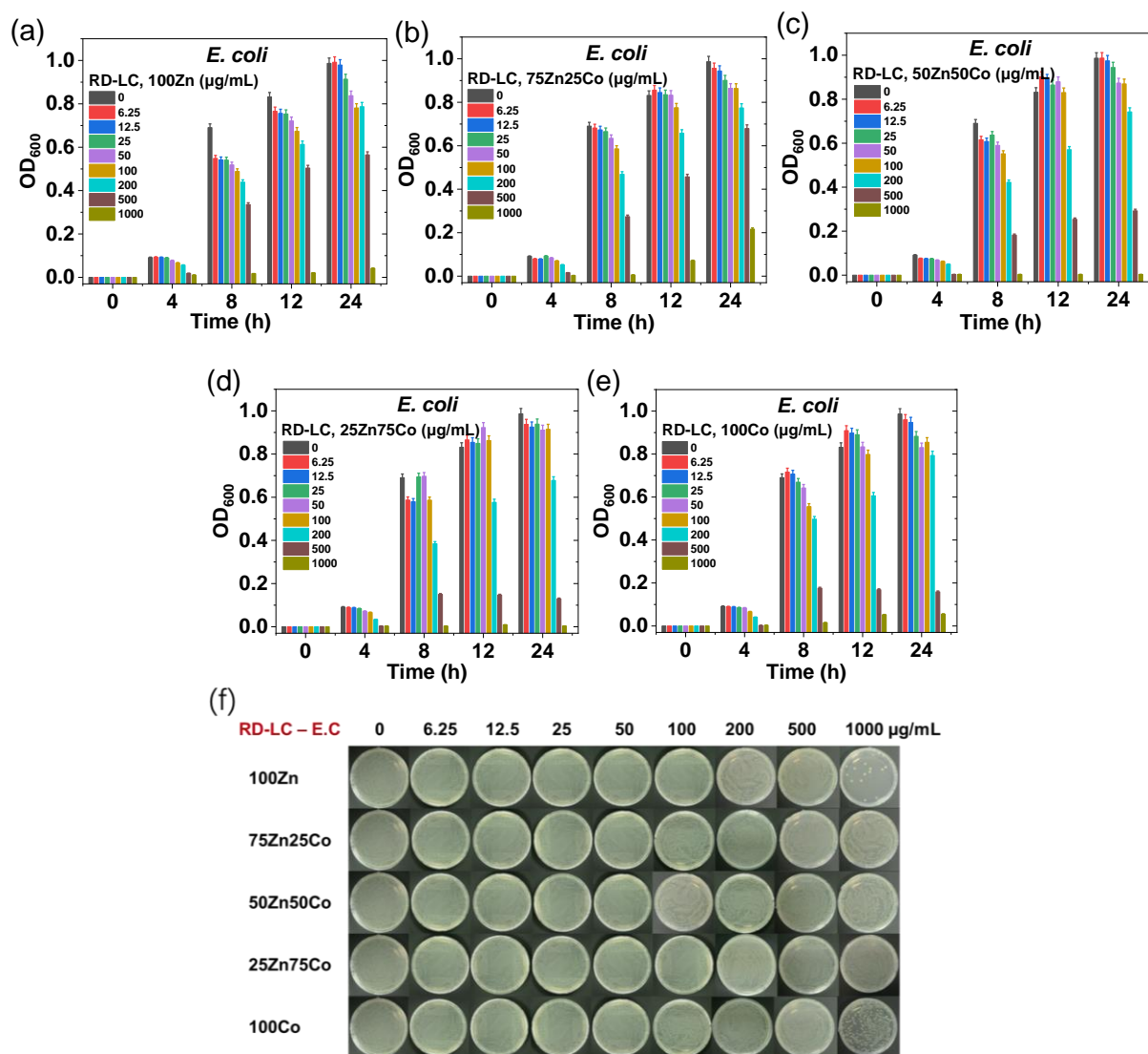


**Figure S9** Bacterial cell viability of *E. coli* measured at various time intervals after being exposed to different concentrations of (a) LC-100Zn, (b) LC-75Zn25Co, (c) LC-50Zn50Co, (d) LC-25Zn75Co, and (e) LC-100Co. (f) Corresponding photographs of bacterial colony with different treatments in agar plates. Data are provided as the mean  $\pm$  SD, n = 3.

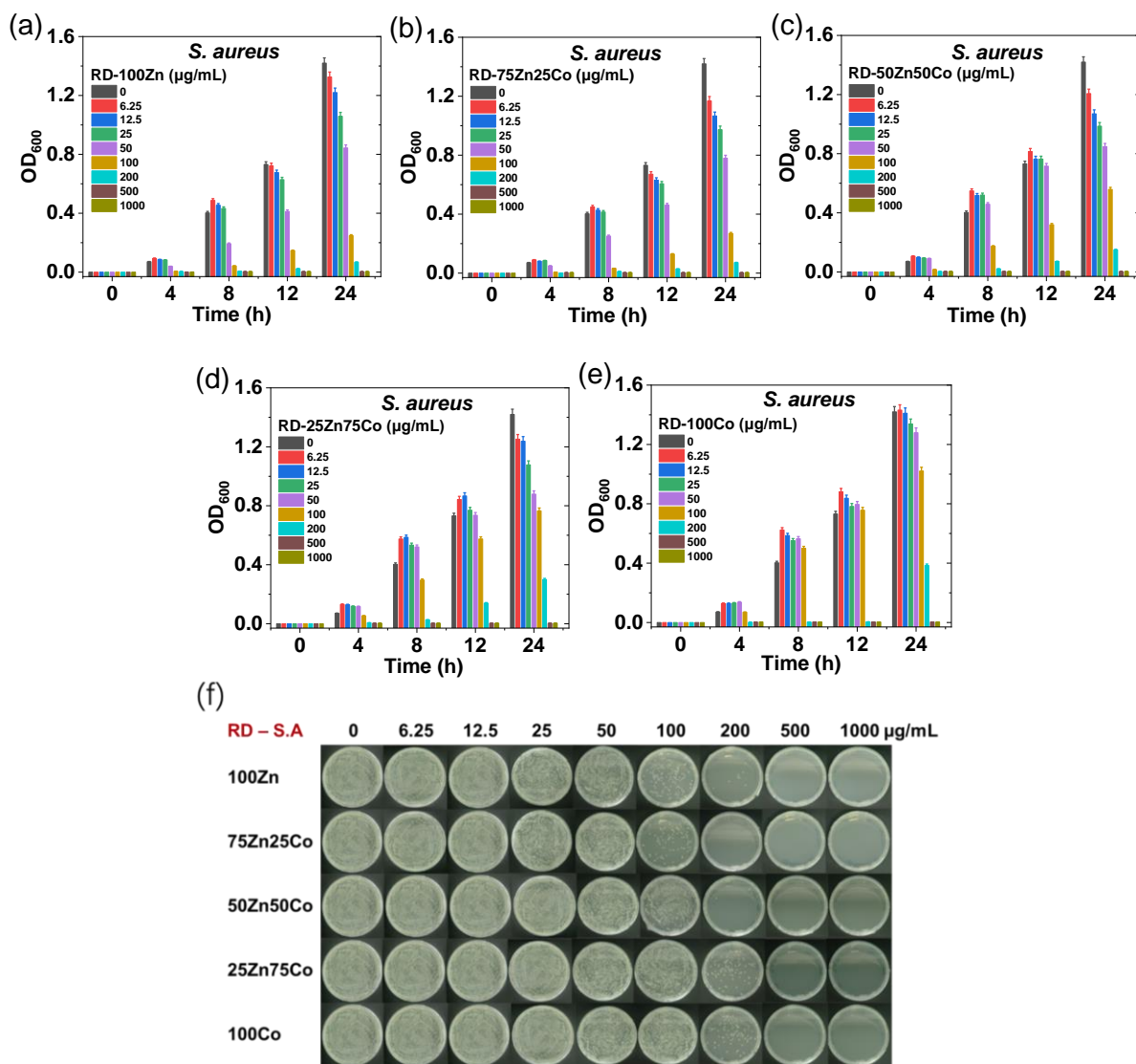


**Figure S10** Bacterial cell viability of *S. aureus* measured at various time intervals after being exposed to different concentrations of (a) RD-LC-100Zn, (b) RD-LC-75Zn25Co, (c) RD-LC-50Zn50Co, (d) RD-LC-25Zn75Co, and (e) RD-LC-100Co. (f) Corresponding photographs of bacterial colony with different treatments in agar plates. Data are provided as the mean  $\pm$  SD,  $n = 3$ .

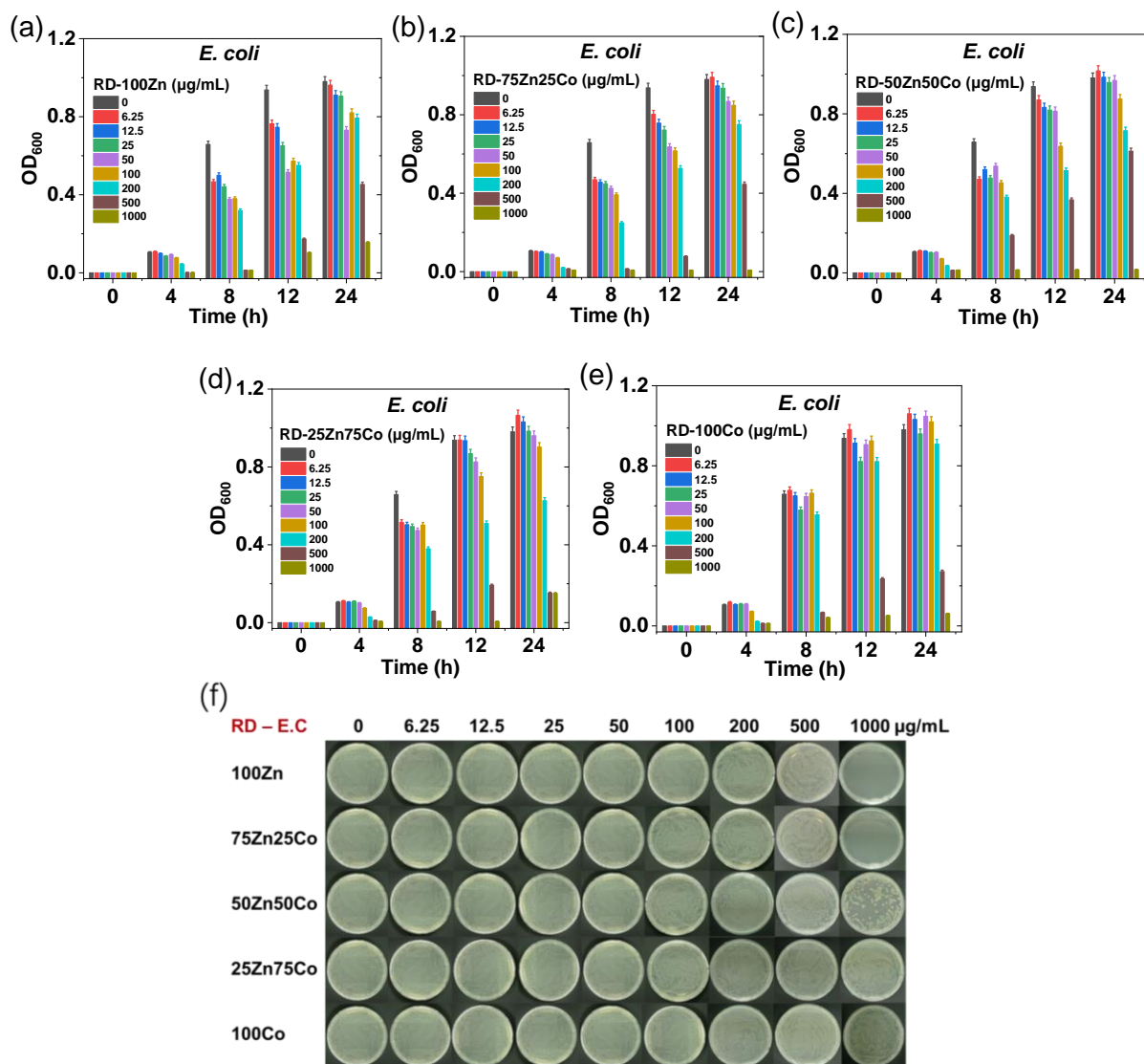




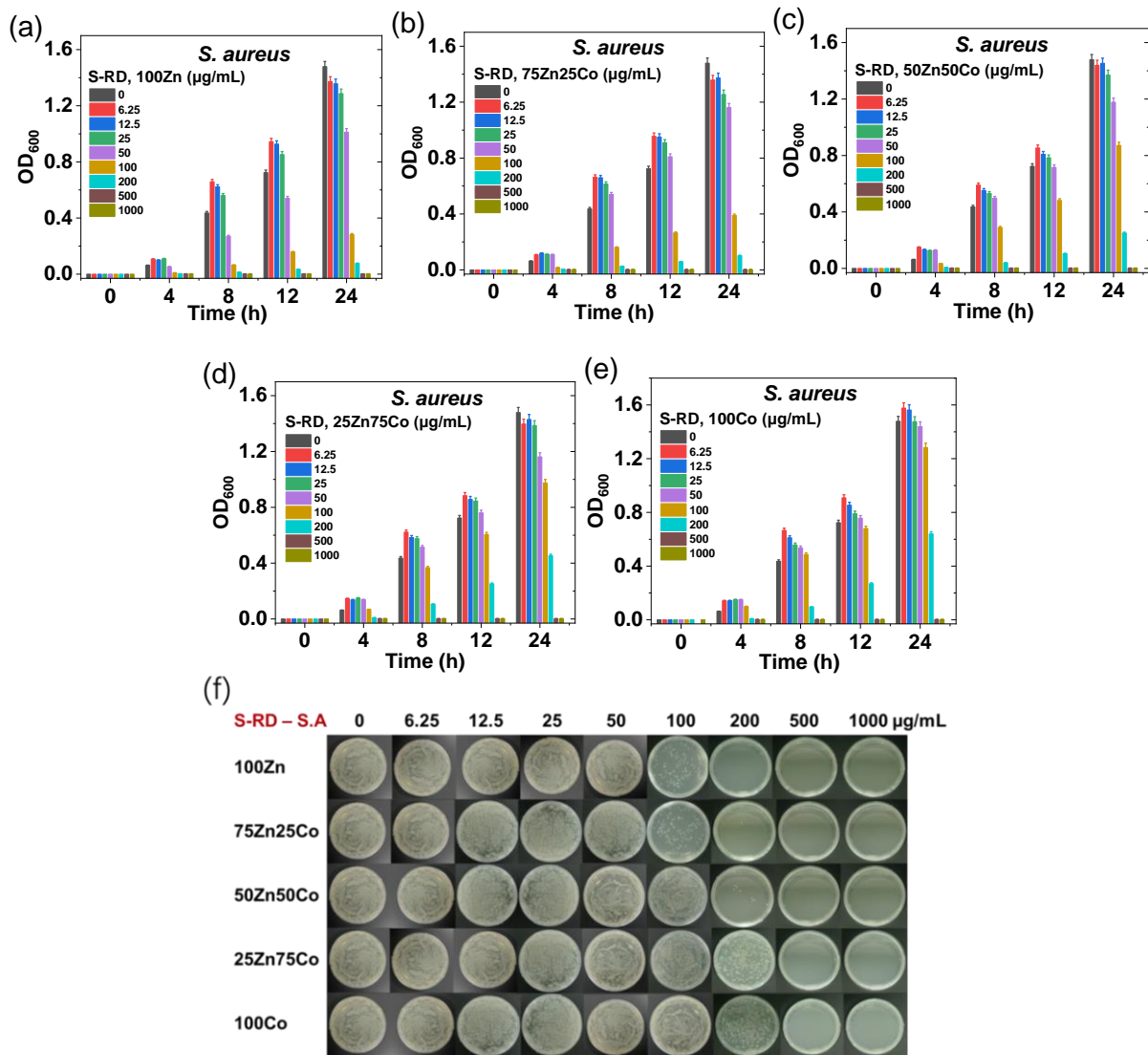
**Figure S11** Bacterial cell viability of *E. coli* measured at various time intervals after being exposed to different concentrations of (a) RD-LC-100Zn, (b) RD-LC-75Zn25Co, (c) RD-LC-50Zn50Co, (d) RD-LC-25Zn75Co, and (e) RD-LC-100Co. (f) Corresponding photographs of bacterial colony with different treatments in agar plates. Data are provided as the mean  $\pm$  SD,  $n = 3$ .



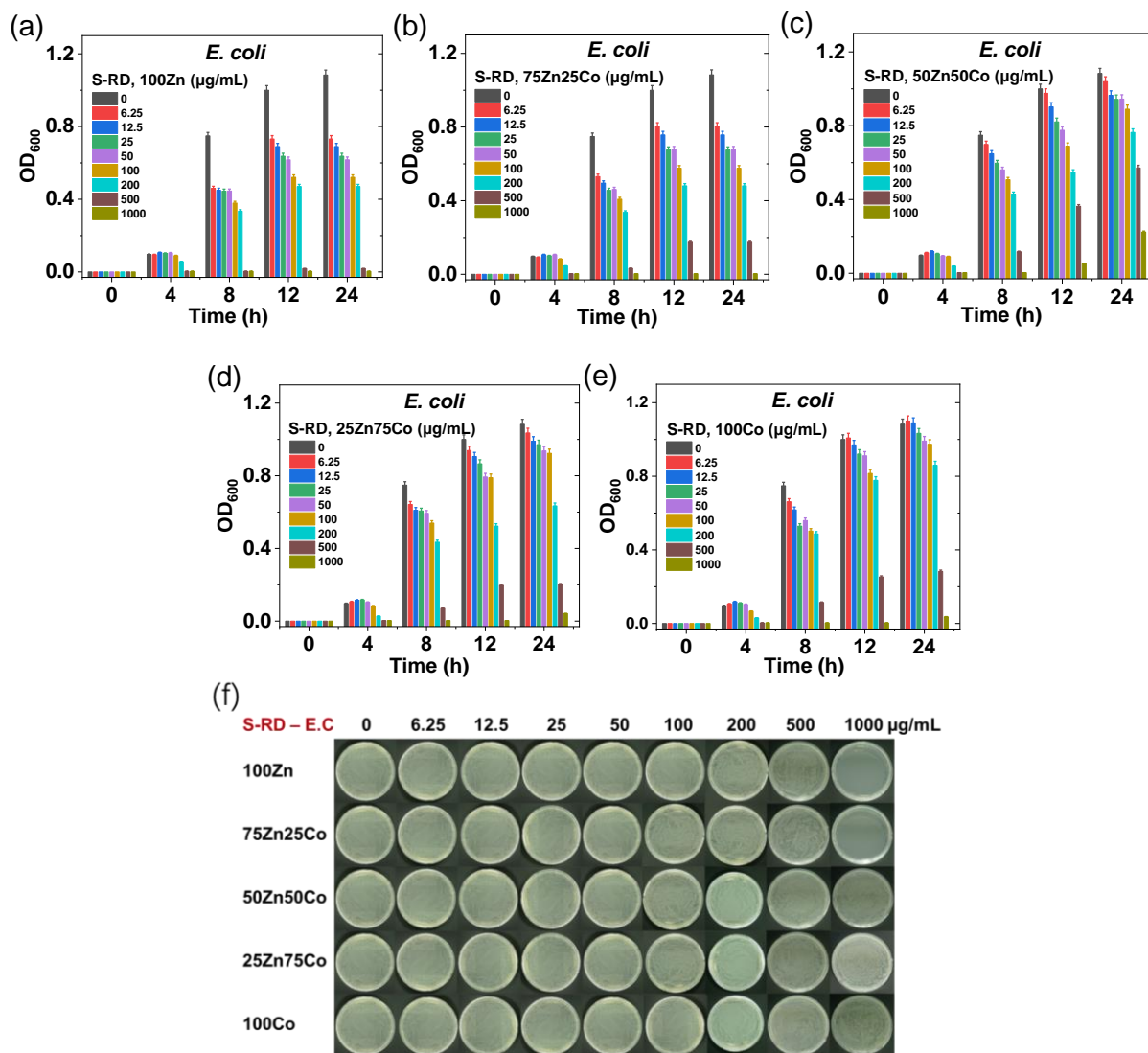
**Figure S12** Bacterial cell viability of *S. aureus* measured at various time intervals after being exposed to different concentrations of (a) RD-100Zn, (b) RD-75Zn25Co, (c) RD-50Zn50Co, (d) RD-25Zn75Co, and (e) RD-100Co. (f) Corresponding photographs of bacterial colony with different treatments in agar plates. Data are provided as the mean  $\pm$  SD, n = 3.



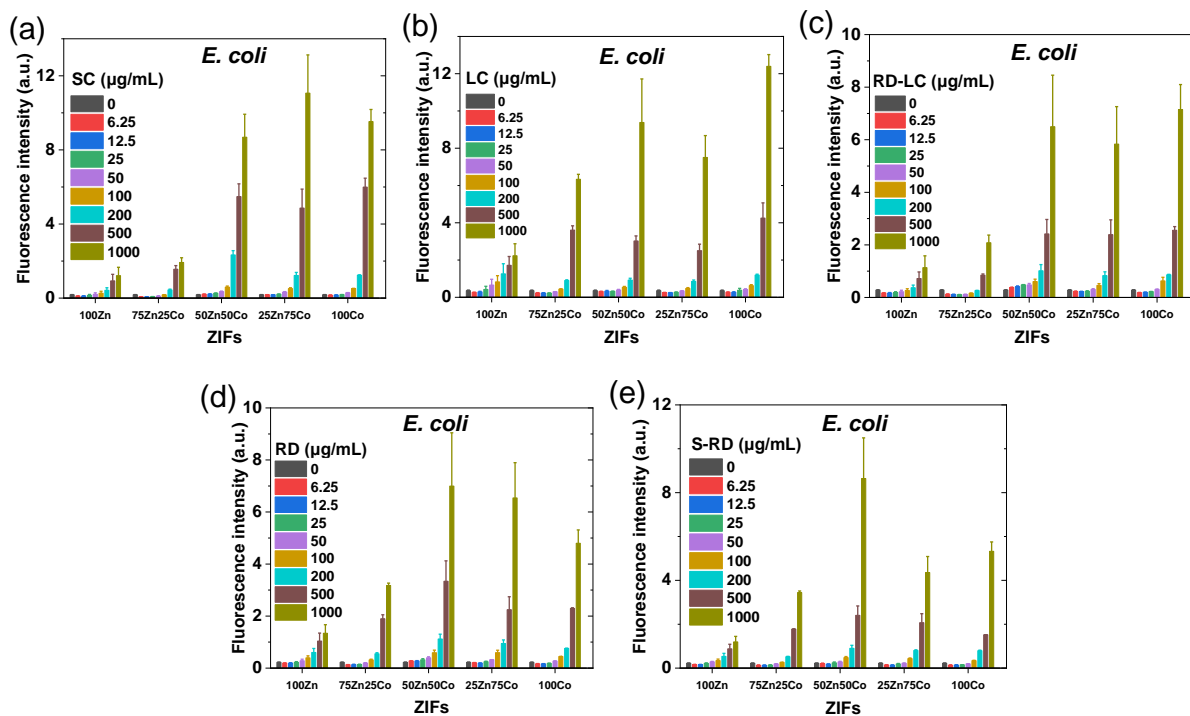
**Figure S13** Bacterial cell viability of *E. coli* measured at various time intervals after being exposed to different concentrations of (a) RD-100Zn, (b) RD-75Zn25Co, (c) RD-50Zn50Co, (d) RD-25Zn75Co, and (e) RD-100Co. (f) Corresponding photographs of bacterial colony with different treatments in agar plates. Data are provided as the mean  $\pm$  SD, n = 3.



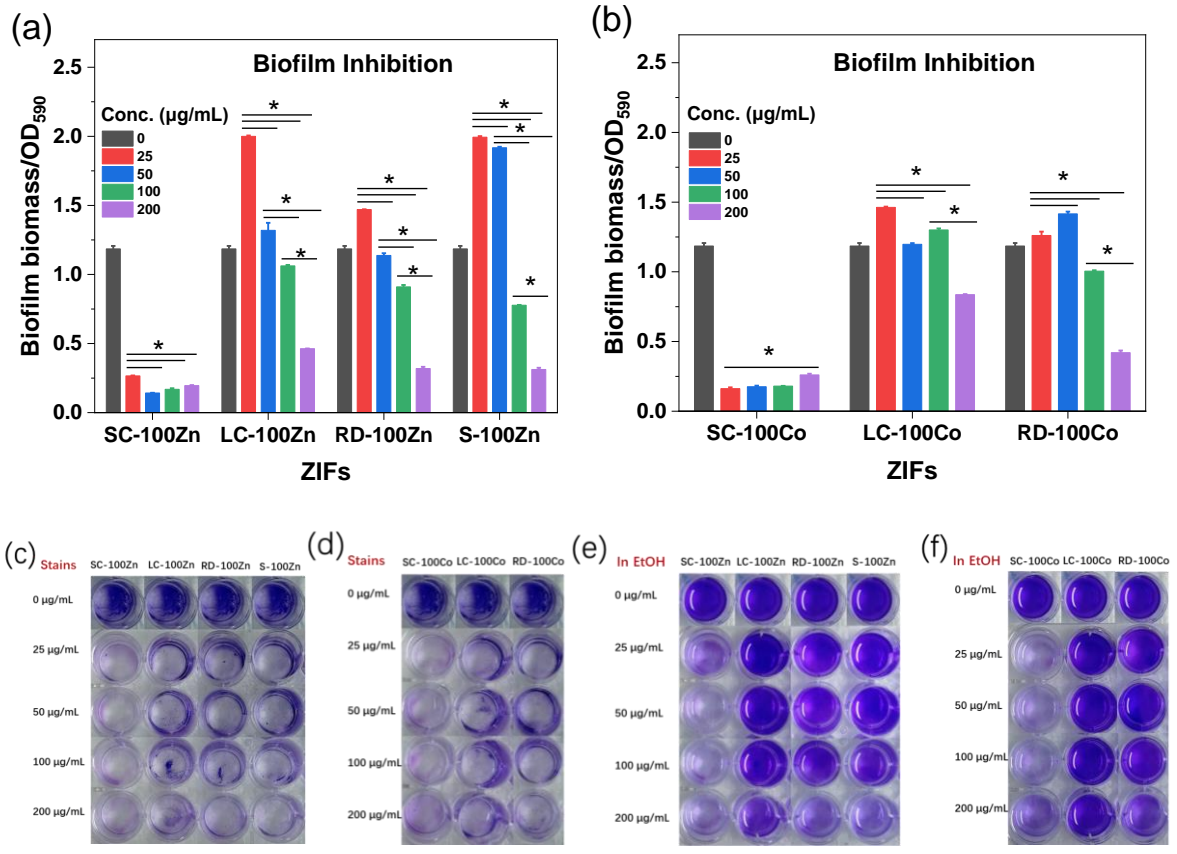
**Figure S14** Bacterial cell viability of *S. aureus* measured at various time intervals after being exposed to different concentrations of (a) S-RD-100Zn, (b) S-RD-75Zn25Co, (c) S-RD-50Zn50Co, (d) S-RD-25Zn75Co, and (e) S-RD-100Co. (f) Corresponding photographs of bacterial colony with different treatments in agar plates. Data are provided as the mean  $\pm$  SD, n = 3.



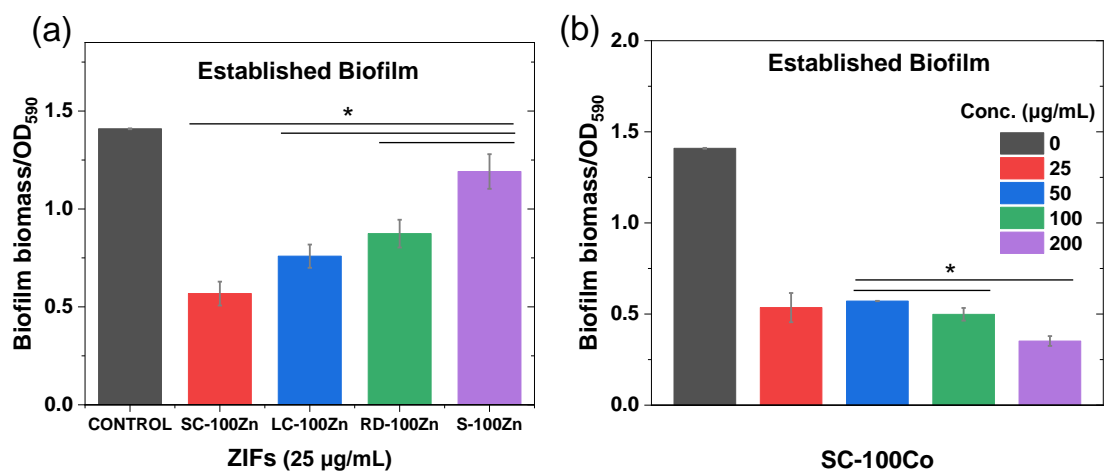
**Figure S15** Bacterial cell viability of *E. coli* measured at various time intervals after being exposed to different concentrations of (a) S-RD-100Zn, (b) S-RD-75Zn25Co, (c) S-RD-50Zn50Co, (d) S-RD-25Zn75Co, and (e) S-RD-100Co. (f) Corresponding photographs of bacterial colony with different treatments in agar plates. Data are provided as the mean  $\pm$  SD, n = 3.



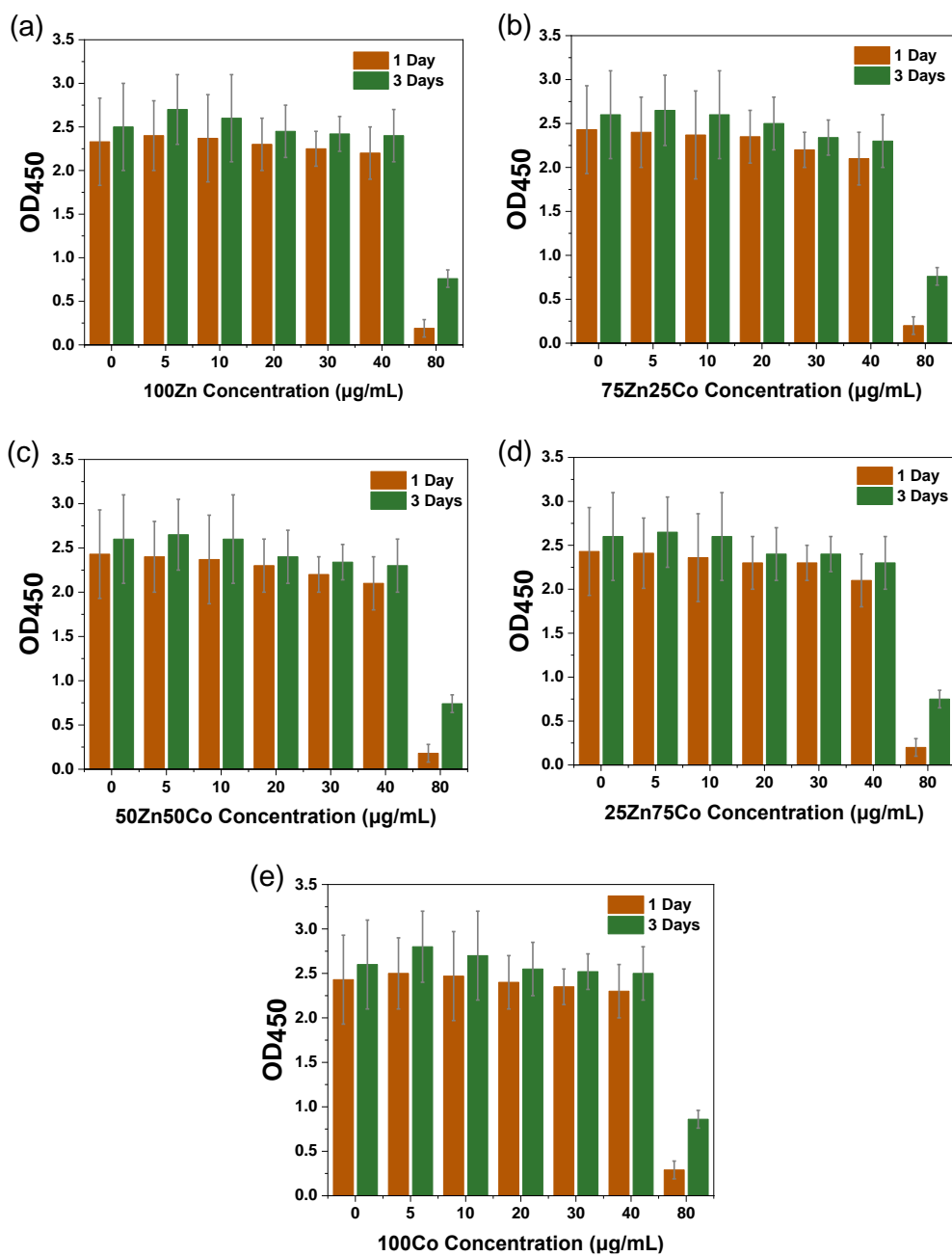
**Figure S16** ROS generation in *E. coli* after exposure to various concentrations of ZIFs using DCFH-DA. Data are provided as the mean  $\pm$  SD,  $n = 3$ .



**Figure S17** The effect of ZIFs on inhibiting biofilms. Biofilm biomass treated with different concentrations of (a) 100Zn and (b) 100Co. Pictures of crystal violet-stained biofilms treated with (c) 100Zn and (d) 100Co. Pictures of crystal violet-stained biofilms dissolved in ethanol (e) 100Zn and (f) 100Co. Data are provided as the mean  $\pm$  SD, n = 3. \*P < 0.05.



**Figure S18** The effect of ZIFs on eliminating the established biofilms. Biofilm biomass treated with different concentrations of ZIFs: (a) 100Zn group (b) SC-100Co. Data are provided as the mean  $\pm$  SD, n = 3. \*P < 0.05.



**Figure S19** Cytotoxicity evaluation of (a) 100Zn, (b) 75Zn25Co, (c) 50Zn50Co, (d) 25Zn75Co, and (e) 100Co ZIF particles