Supporting Information

Photothermal Synergy Effect of Pure $Ti_3C_2T_x$ in Antibacterial Reaction and Its Mechanism

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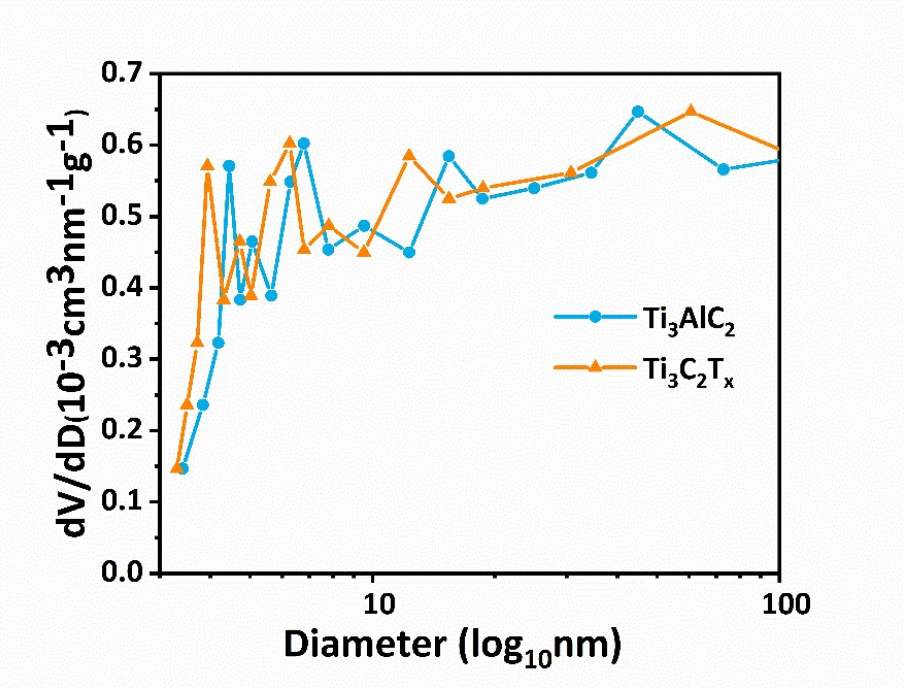

Figure S1. Pore size distribution curves.

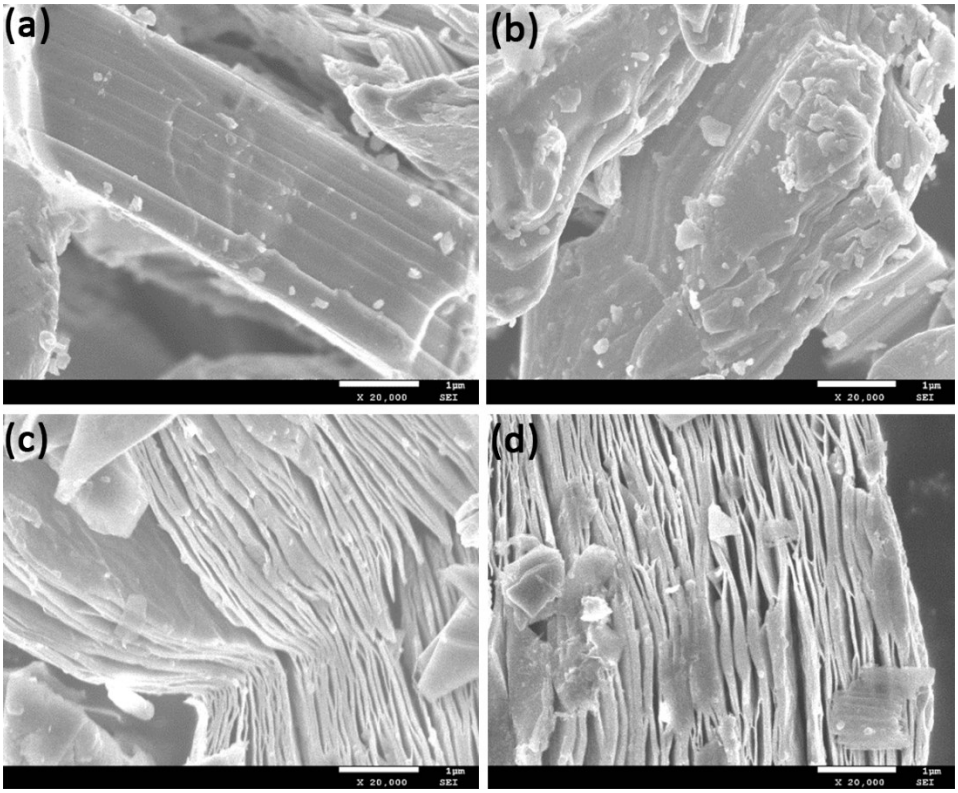

Figure S2. SEM of (a-b) Ti_3AlC_2 and (c-d) $Ti_3C_2T_x$.

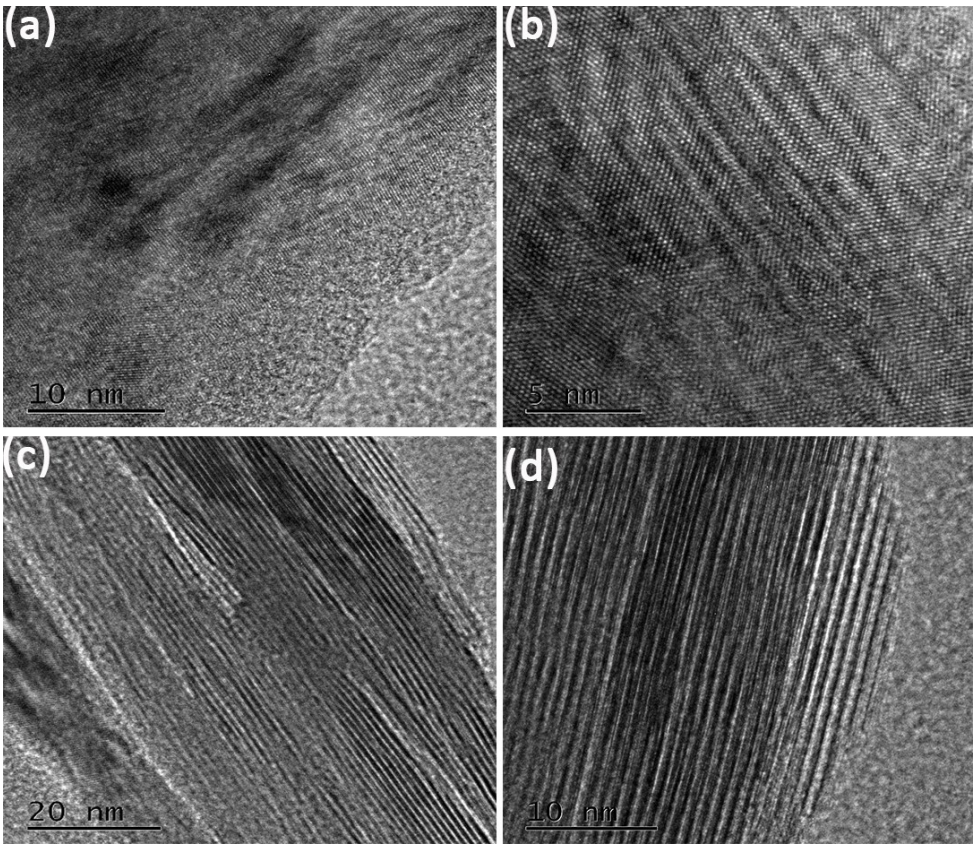

Figure S3. HRTEM of (a-b) Ti_3AlC_2 and (c-d) $Ti_3C_2T_x$.

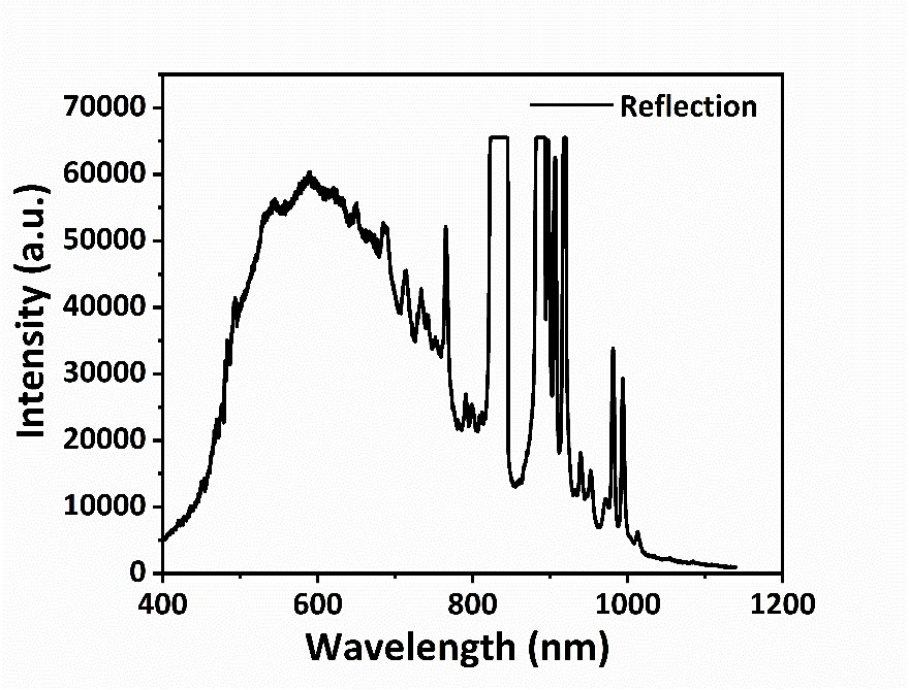

Figure S4. Complete spectrum of the light.

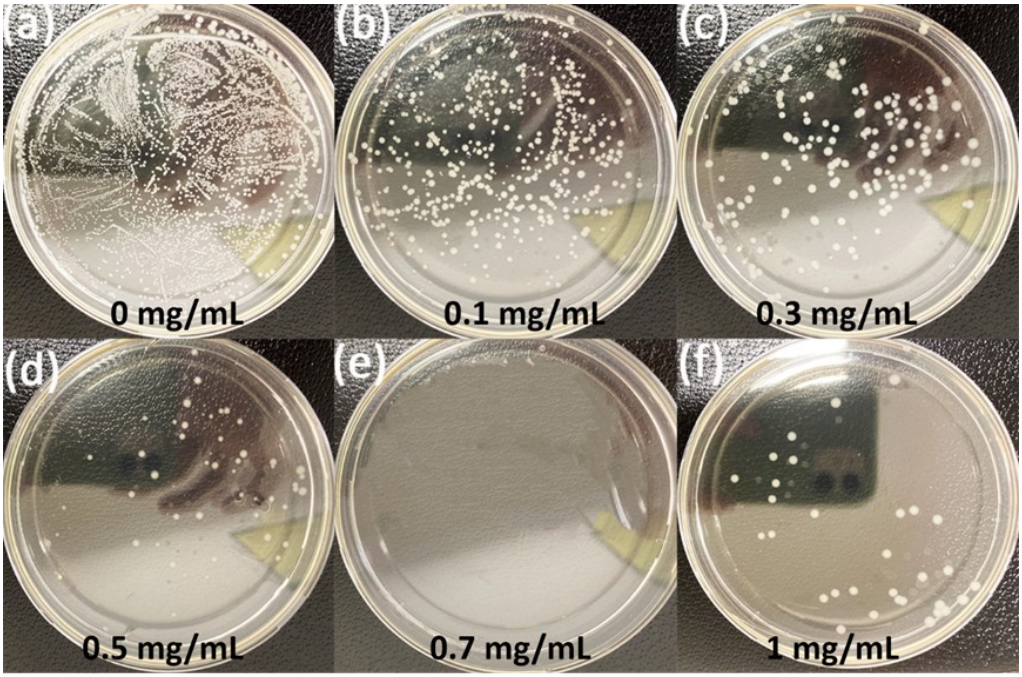

Figure S5. Photos of the bacterial solution in the medium after sterilization with different concentrations of $Ti_3C_2T_x$ (dilution ratio is 10^{-2}).

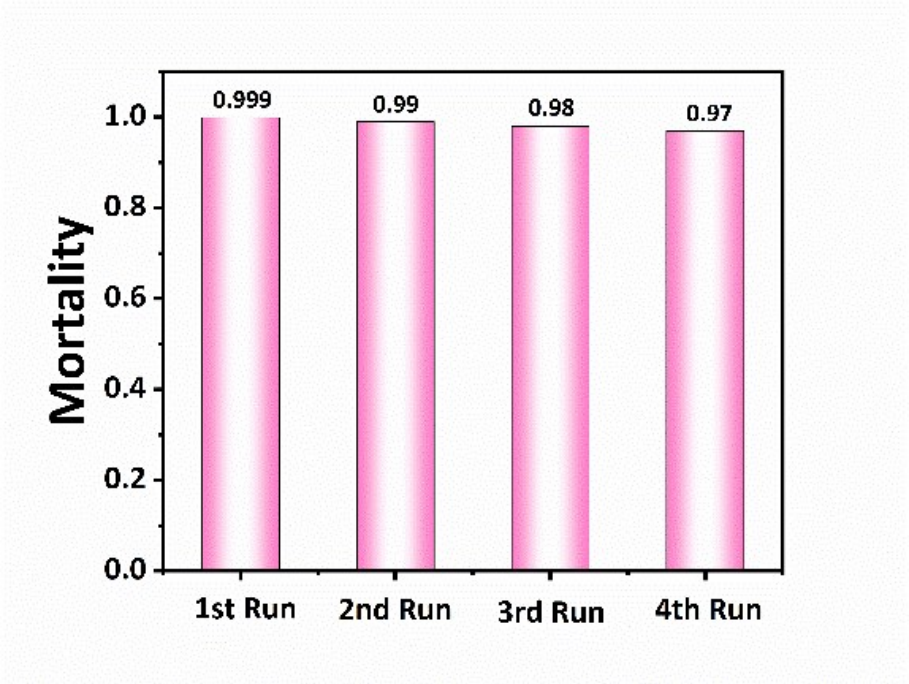

Figure S6. Cyclic sterilization experiment.

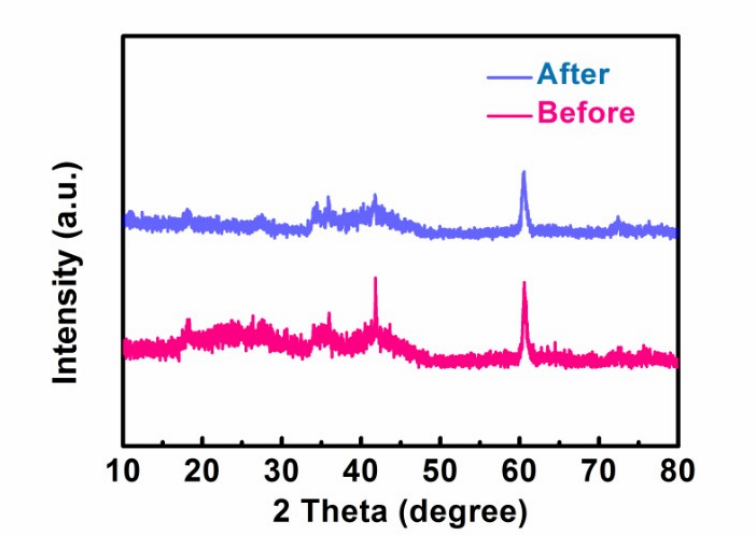

Figure S7. XRD patterns of $Ti_3C_2T_x$ before and after cyclic sterilization experiment.

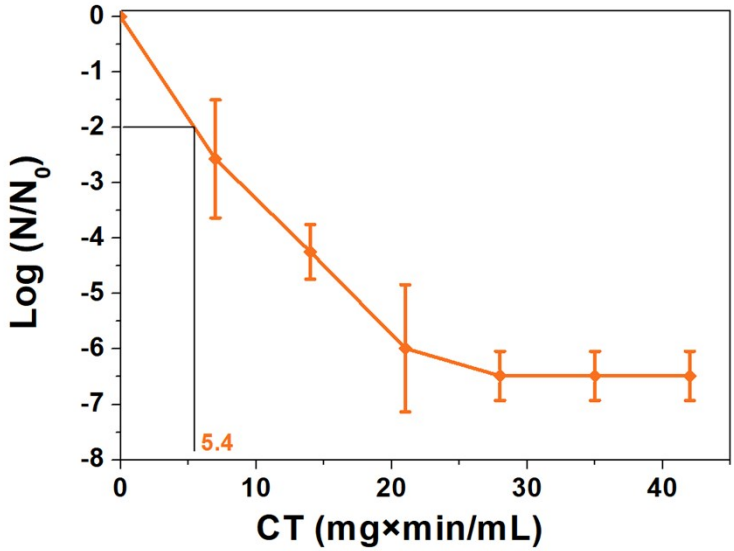

Figure S8. The inactivation curves of normal and starved E. coli cells. The error bars represent the standard error from triplicate inactivation experiments.

$$\mathbf{Log\ (N/N_0) = -k\ (CT)}$$

where N_0 is the initial *E. coli* population (cfu/mL), N the remaining *E. coli* population at time t (cfu/mL), C the catalyst concentration (mg/mL), k the inactivation rate constant (mL/(mg min)), and T the inactivation time (min).

In order to compare it to traditional sterilization methods, the improved *Chick-Watson* inactivation model was used to simulate the inactivation profile of $Ti_3C_2T_x$ (Figure S8). It can be found that the log removal credits of sterilization (the catalyst CT for achieving 2 log E. coli inactivation) was found to be 5.4 mg min/mL.