Electronic Supplementary Information

Flower-shaped TiO_2 clusters for highly efficient photocatalysts

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1. Materials

All the reagents were purchased and used without any treatment: Sulphuric acid (H_2SO_4), Tetrabutyl titanate (TBT) and Rhodamine B (RhB) (Sigma Aldrich), P25 TiO_2 (Shanghai Machkin Biochemical Co., Ltd.), Acetone and Alcohol (Beijing Chemical Works).

2. Schematic diagram and simulated laser intensity distribution of the three-beam and two-beam laser interference ablation.

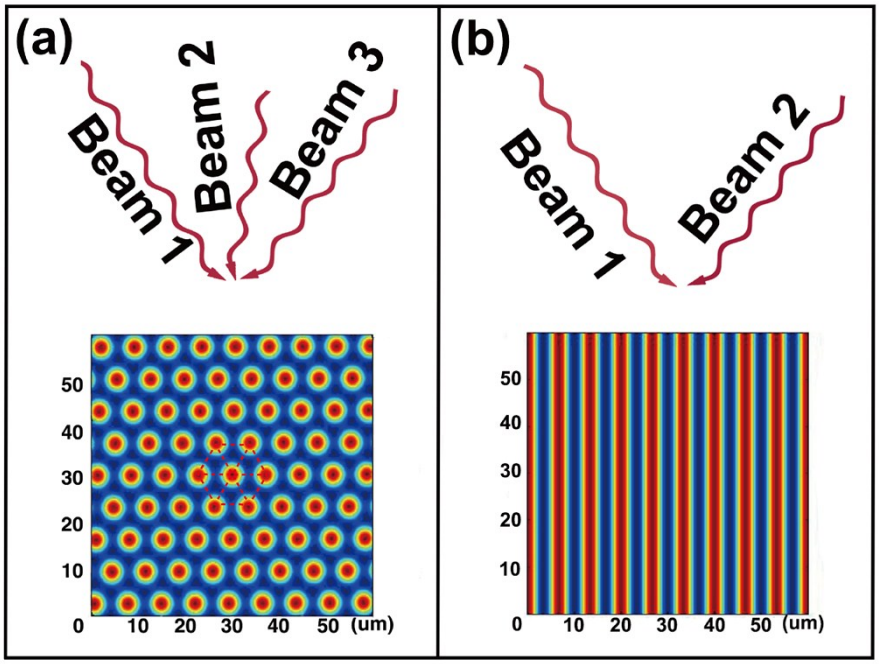

Fig. S1. The schematic diagram and simulated laser intensity distribution of the three-beam (a) and two-beam (b) laser interference ablation.

3. SEM images of 1D and 2D grating structures on FTO substrates

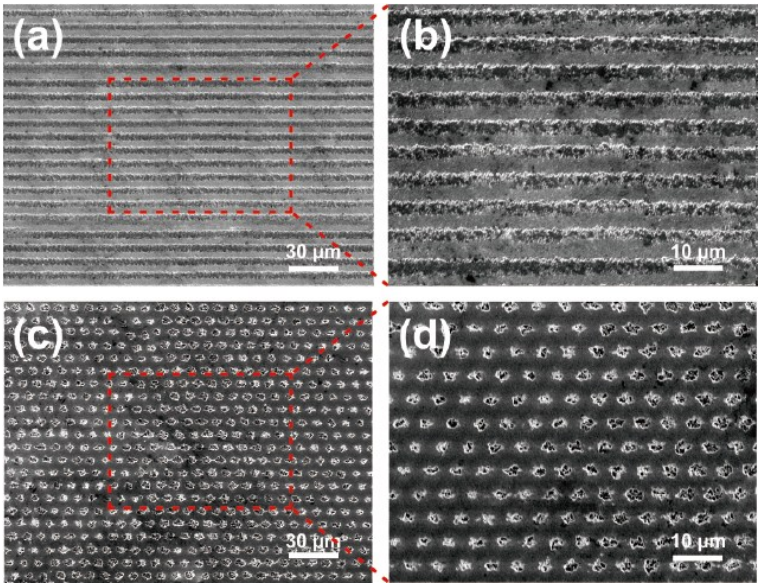

Fig. S2. The SEM images of ablated FTO substrate surfaces after direct laser interference ablation. (a), (c) 1D and 2D grating structures of top view, respectively, etched by two-beam and three-beam laser interference. (b), (d) Enlarged SEM images of 1D and 2D grating structures.

4. SEM images of unpatterned TiO_2 nanowire arrays

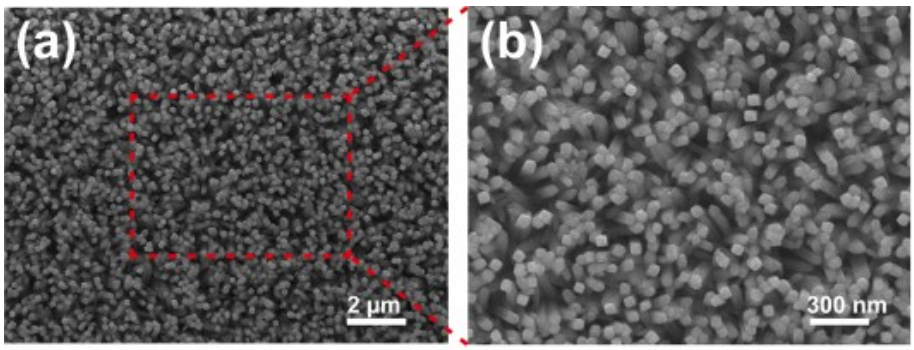

Fig. S3. (a)-(b) SEM images of unpatterned TiO_2 nanowire arrays.

5. Schematic diagram of duty cycle

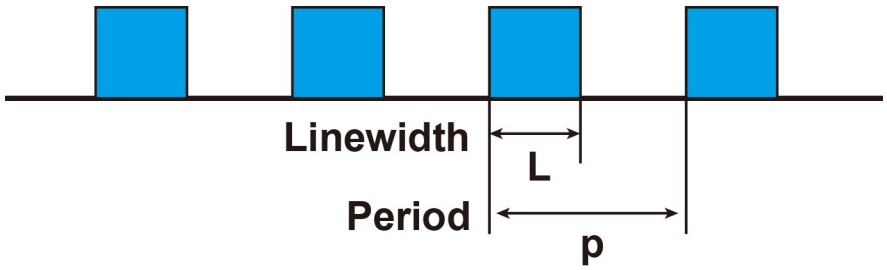

Fig. S4. Duty cycle is defined as the ratio of linewidth (L) to spatial period (p), L/p.

6. The contact angle measurements

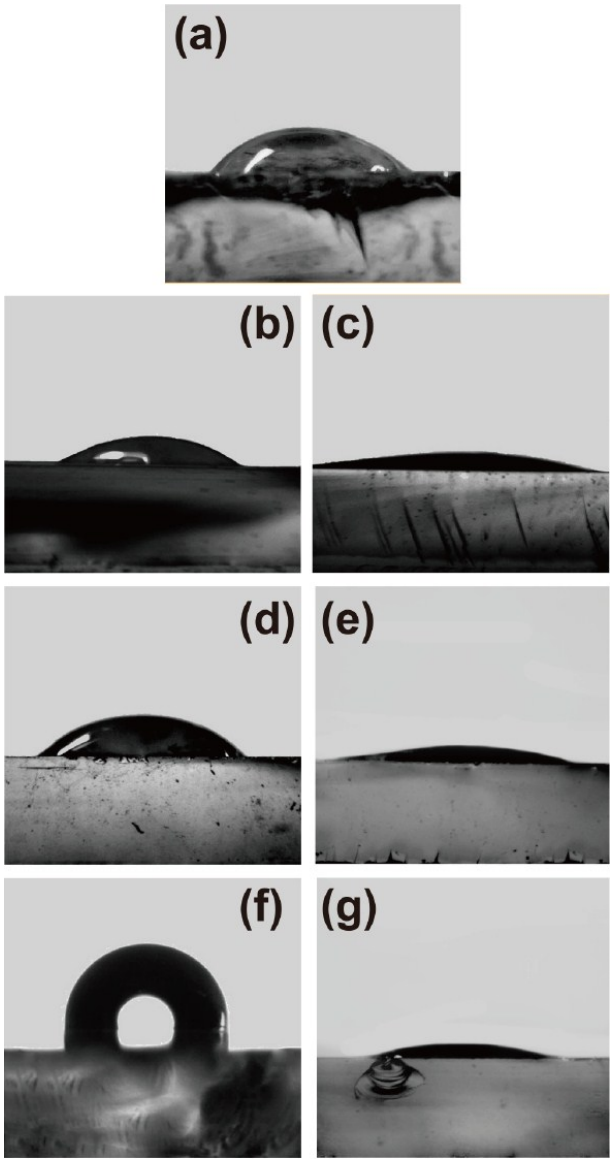

Fig. S5. Optical images of contact angles of bare FTO substrate, unpatterned TiO_2 nanowire arrays, 1D and 2D TiO_2 clusters. (a) The contact angle of bare FTO substrate, (b), (d) and (f) The contact angles before the UV treatment of unpatterned TiO_2 nanowire arrays, 1D and 2D TiO_2 clusters, respectively. (c), (e) and (g) The contact angles after the UV treatment.