Supporting Information

Flower-like $Zn_3V_2O_8$/Ag composite with enhanced visible light driven photocatalytic activity: triple-functional roles of Ag nanoparticles

Peng Liu[1], Yi Jianhong[1,2,*], Rui Bao[1,2,*], Dong Fang[1]

1 Faculty of Materials Science and Engineering, Kunming University of Science and Technology, Kunming 650093, China

2 Key Laboratory of Advanced Materials of Yunnan Province, Kunming 650093, China

Corresponding author.

E-mail: yijianhong@kmust.edu.cn (Jianhong Yi)

E-mail: baorui@kmust.edu.cn (Rui Bao)

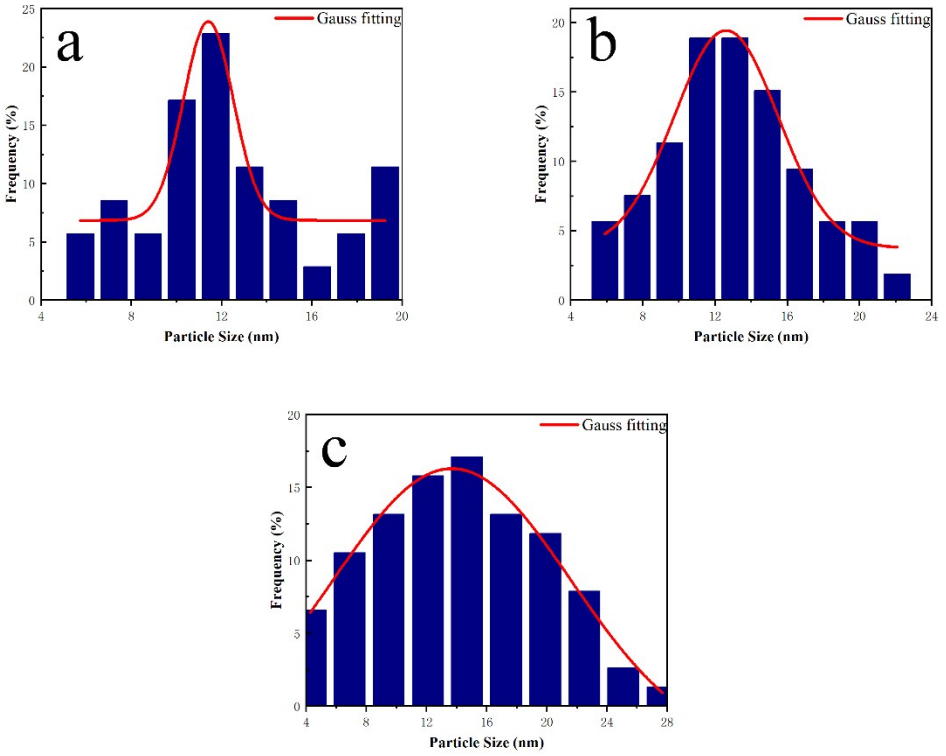

Fig. S1 Ag particle size distribution of ZnVO-Ag1 (a), ZnVO-Ag4 (b) and ZnVO-Ag10 (c)

Base on Fig. 3(b), (d) and (e), the size distributions of Ag particles were calculated, and the average size of Ag nanoparticles on the surface of ZnVO-Ag1, ZnVO-Ag4 and ZnVO-Ag10 is 11.42 nm, 12.62 nm and 13.70 nm, respectively. It can be seen that the decrease in photocatalytic performance is due to the fact that excessive Ag agglomeration affects the absorption of light and becomes the center of electrons and holes recombination, rather than the increase in Ag particle size.

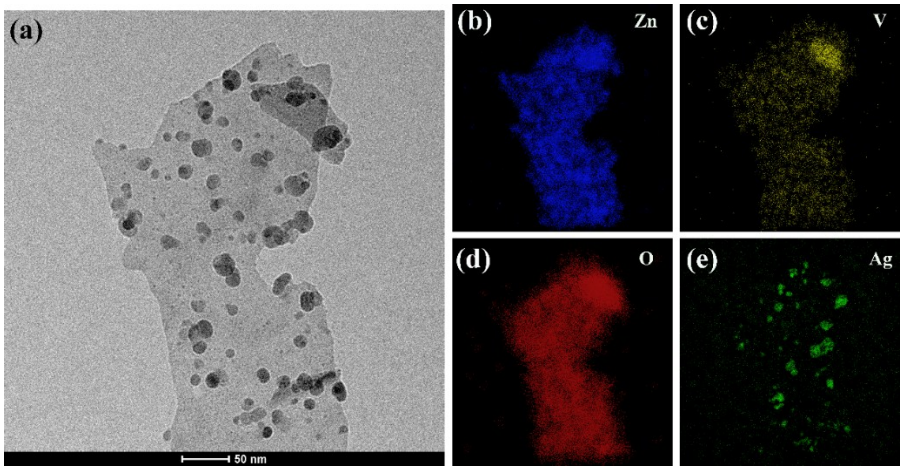

Fig. S2 TEM of ZnVO-Ag4 (a) and corresponding element mapping (b), (c), (d) and (e)

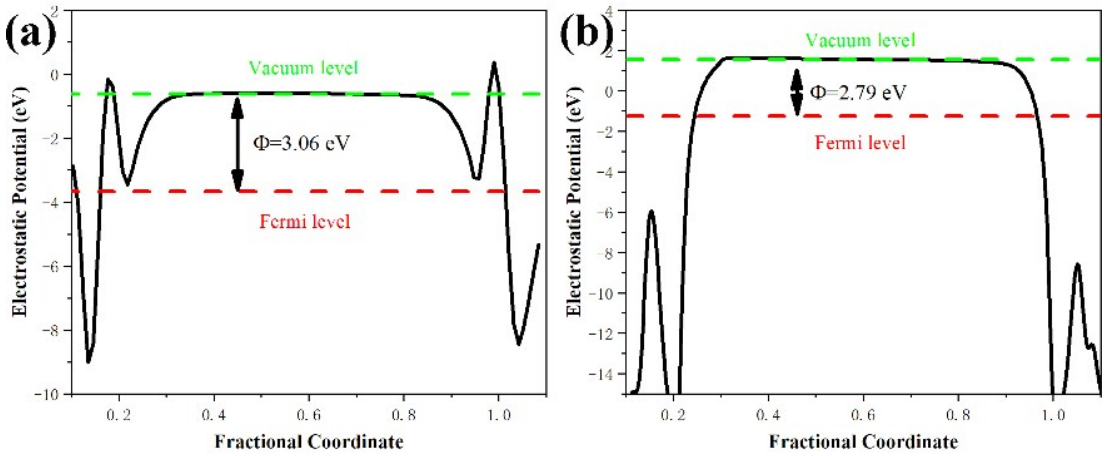

Fig. S3 Work function of ZnVO (a), and ZnVO-Ag4 (b)

In order to verify the relationship between orbital hybridization and electron excitation. As shown in Fig. S3, ZnVO-Ag4 has a lower work function, which means nothing but the less external energy was required to excite the electrons from VB of ZnVO-Ag4, and this is due to weakened orbital hybridization of ZnVO-Ag4 VB.

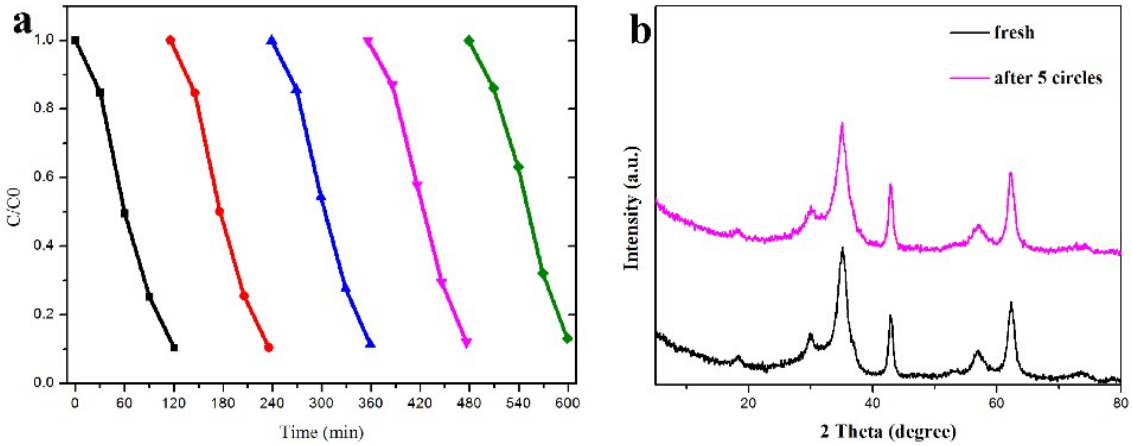

Fig. S4 The circle experiment (a) and the XRD pattern of fresh and after 5 circles ZnVO-Ag4

After 5 circles, the ZnVO-Ag4 still remains relatively high photocatalytic efficiency, and no significant changes in crystal structure and phase were observed.