Electronic Supplementary Material (ESI) for RSC Advances.
This journal is © The Royal Society of Chemistry 2016

# Electronic Supplementary Information (ESI)

## Highly enhanced photocatalytic activity of $WO_3$ thin film loaded with Pt-Ag bimetallic alloy nanoparticles

Pengyu Dong[a*], Bairen Yang[b], Chao Liu[c], Fenghua Xu[c], Xinguo Xi[d], Guihua Hou[a] and Rong Shao[d**]

[a]Key Laboratory for Advanced Technology in Environmental Protection of Jiangsu Province, Yancheng Institute of Technology, Yancheng 224051, P. R. China

[b]School of Environmental Science and Engineering, Yancheng Institute of Technology, Yancheng 224051, China

[c]School of Materials Engineering, Yancheng Institute of Technology, Yancheng 224051, China

[d]Jiangsu Collaborative Innovation Center for Ecological Building Materials and Environmental Protection Equipments, Yancheng Institute of Technology, Yancheng 224051, China.

*Corresponding author: dongpy11@gmail.com

Tel.: +86-515-8829-8923; Fax.: +86-515-8829-8923.

**Corresponding author:E-mail: sr@ycit.cn

**Electrochemical Measurement**

The electrochemical impedance spectra (EIS) and Mott–Schottky (MS) plots of as-prepared pure $WO_3$, Pt/$WO_3$, Ag/$WO_3$ and Pt-Ag/$WO_3$ thin films were measured on an electrochemical analyzer (CHI660E) (Shanghai Chenhua Instruments Co., Ltd., Shanghai, China) in a standard three-compartment cell using 0.5 M $Na_2SO_4$ (pH = 6.8) solution as the electrolyte. The surface of working electrode exposed to the electrolyte was a circular film with the geometrical surface areas of 9 $cm^2$ (3*3 cm). Platinum foil was used as counter electrode and Ag/AgCl electrode as the reference electrode. The EIS were measured at 0.0 V. A sinusoidal ac perturbation of 5 mV was applied to the electrode over the frequency range of 1–$10^5$ Hz. The MS plots were obtained at a frequency of 1 kHz.

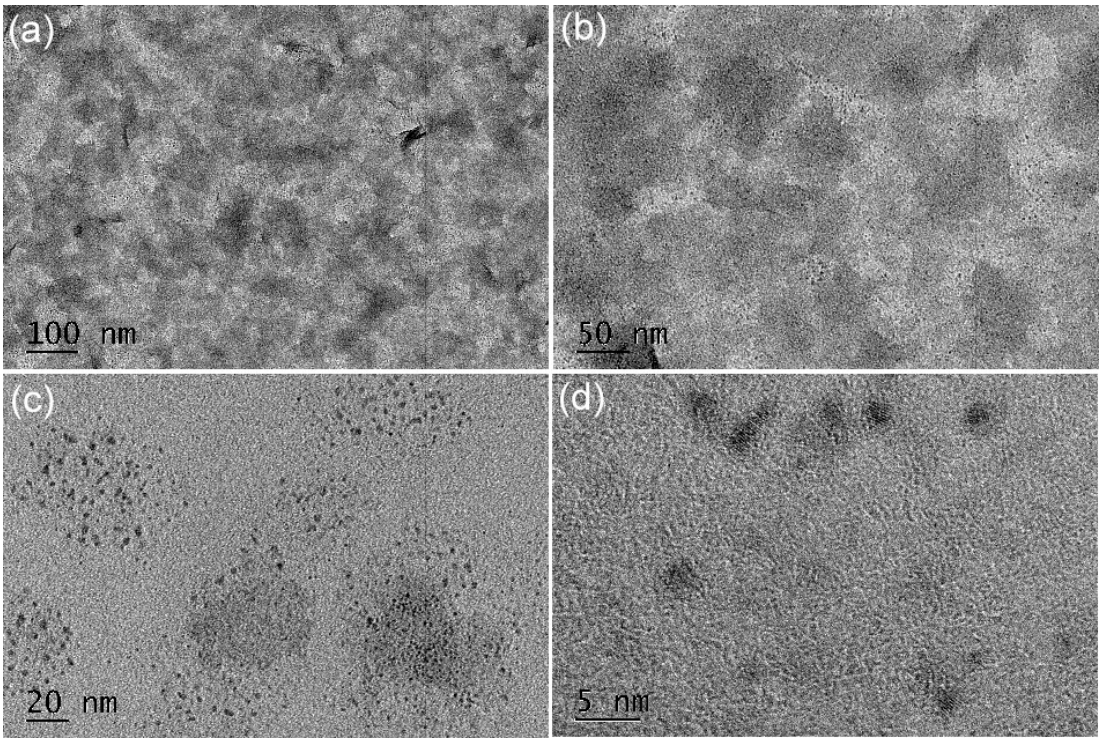


Fig. S1 TEM images of Pt-Ag/$WO_3$ sample.

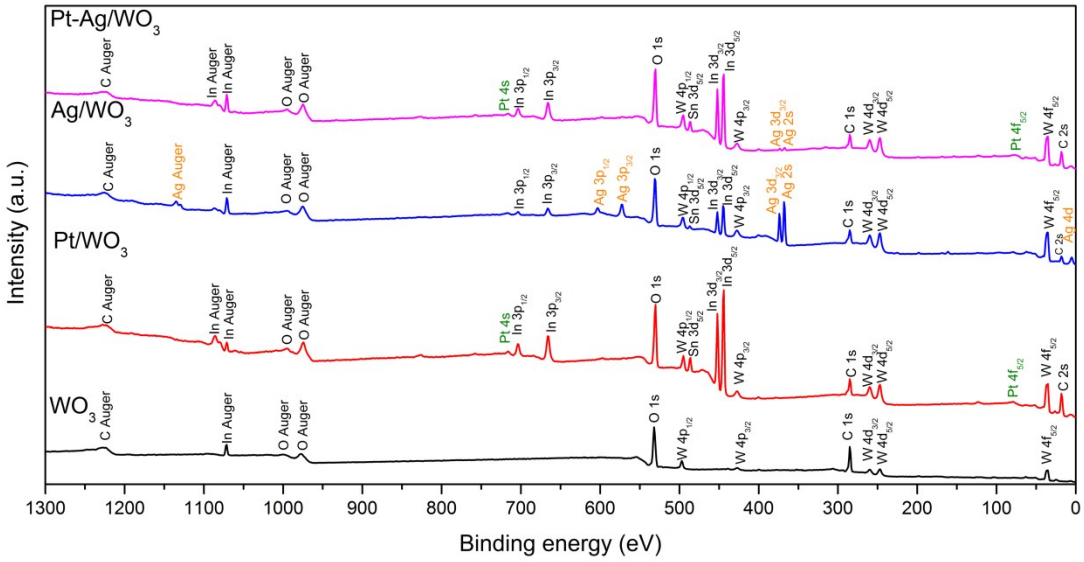


Fig. S2 The survey XPS spectra of as-prepared samples of pure $WO_3$, $Pt/WO_3$, $Ag/WO_3$ and $Pt\text{-}Ag/WO_3$ thin films

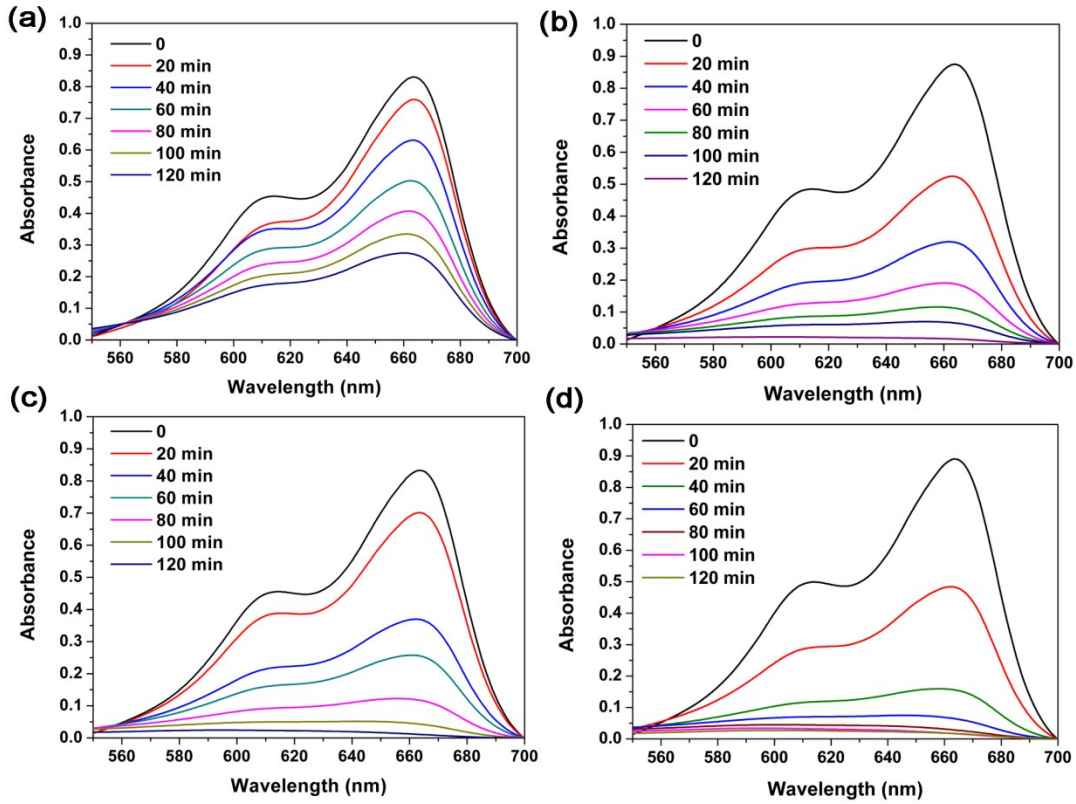


Fig. S3 UV–vis absorption spectra of MB solutions separated from the suspensions containing (a) pure $WO_3$, (b) Pt/$WO_3$, (c) Ag/$WO_3$ and (d) Pt-Ag/$WO_3$ thin films during illumination.