

## Electronic Supporting Information

### **AgPd nanocages sandwiched between MXene nanosheet and PDA layer for photothermally improved catalytic activity and antibacterial properties**

Jie Jin, <sup>\*a</sup> Shanshan Wu,<sup>a</sup> Jing Wang,<sup>b</sup> Yunqi Xu,<sup>c</sup> Shouhu Xuan,<sup>c</sup> and Qunling  
Fang<sup>\*b</sup>

*<sup>a</sup> School of Materials and Chemical Engineering, Anhui Jianzhu University, Hefei, 23  
0601, PR China*

*<sup>b</sup> School of Food and Biological Engineering, Key Laboratory of Metabolism and  
Regulation for Major Diseases of Anhui Higher Education Institutes, Hefei University  
of Technology, Hefei, 230009, PR China*

*<sup>c</sup> CAS Key Laboratory of Mechanical Behavior and Design of Materials, Department  
of Modern Mechanics, University of Science and Technology of China, Hefei, 230027,  
PR China*

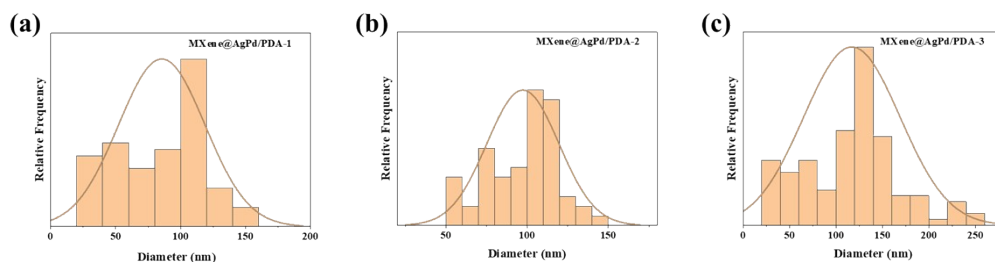
\*Corresponding author:

Asso. Prof. Jie Jin

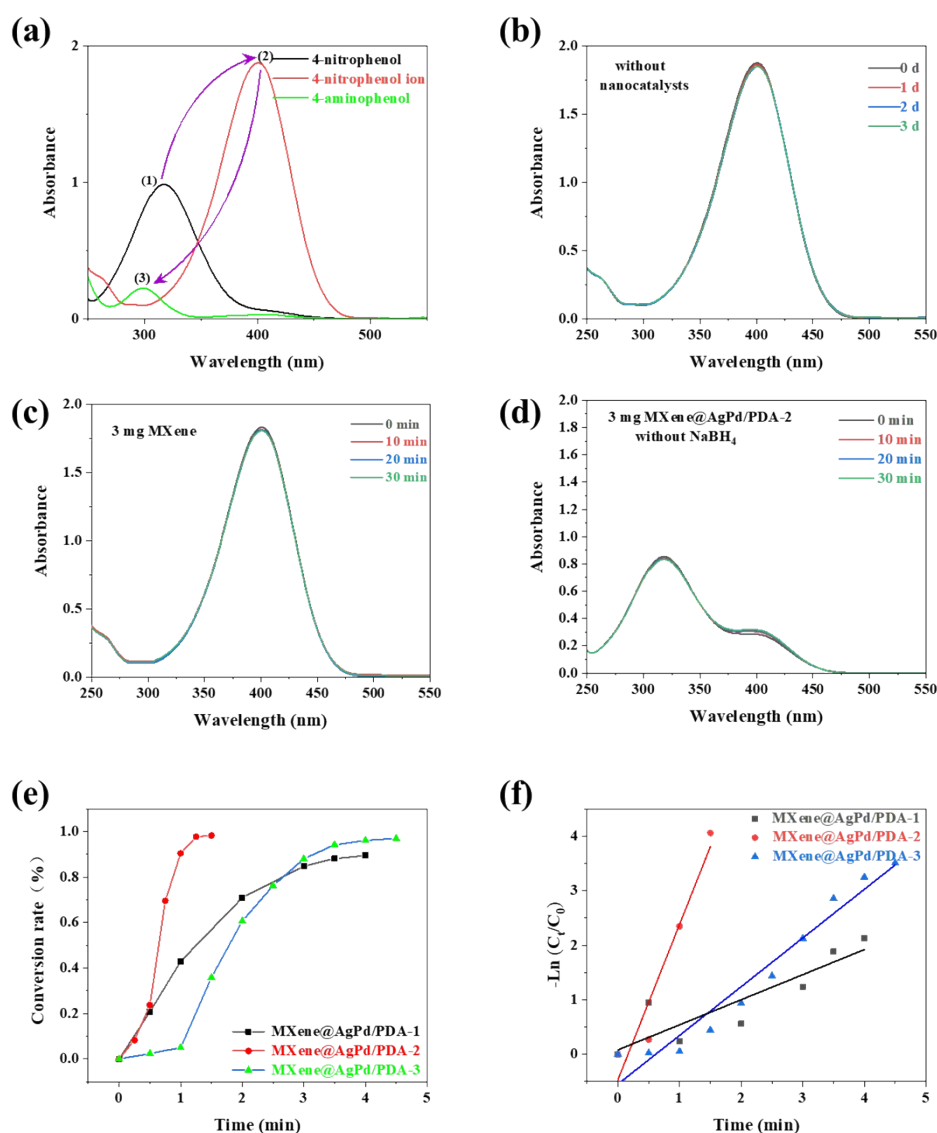
E-mail: jinjie@ahjzu.edu.cn

Asso. Prof. Qunling Fang

E-mail: fql.good@hfut.edu.cn



**Fig. S1** (a-c) Histogram of AgPd nanocage size distribution of the MXene@AgPd/PDA-N (N=1~3) nanosheet.



**Fig. S2** (a) Absorption peak changes of the reduction of 4-nitrophenol to 4-aminophenol: Schematic diagram of position change of maximum absorption peak. (b) With reducing agent, without catalyst. (c) With reducing agent and 3 mg MXene. (d) Without reducing agent, with catalyst. (e) The relationship between the conversion rate and time of different silver-palladium molar ratios. (f) Linear relationship between  $\ln(C_t/C_0)$  and reaction time of different silver-palladium molar ratios.

**Table. S1** The weight percentage of Ag and Pd elements in MXene@AgPd/PDA-2 by ICP-MS.

	Ag (wt%)	Pd (wt%)
MXene@AgPd/PDA-2	7.53	7.53