Electronic Supplementary Information

Porous ternary PtPdCu alloy with spherical network structure for electrocatalytic methanol oxidation

Yang Fan,*ac Yan Zhang,a Ying Cui,a Jiaoli Wang,a Mengmeng Wei,a Xinkang Zhang,a Wei Li*ab

a College of Chemistry and Chemical Engineering, Xinyang Normal University, Xinyang 464000, China. E-mail: yfanchem@163.com
b School of Physics, Huazhong University of Science and Technology, Wuhan 430074, China. E-mail: wl276@hust.edu.cn
c Institute for Conservation and Utilization of Agro-bioresources in Dabie Mountains, Xinyang Normal University, Xinyang 464000, China.

Fig. S1 (a) TEM and (b) HRTEM image of Pt5PdCu5 NSs
**Fig. S2** EDS spectra of Pt$_5$PdCu$_5$ SNs and Pt$_5$PdCu$_5$ NSs.

**Fig. S3** HAADF-STEM image and EDS mapping images of Pt$_5$PdCu$_5$ SNs.
Fig. S4 XPS spectra of the deconvoluted (a) Pt 4f, (b) Pd 3d and (c) Cu 2p peaks for Pt$_5$PdCu$_5$ NSs.

Fig. S5 XRD patterns of alloy samples with different compositions.
**Fig. S6** SEM images of (a) Pt$_5$Cu$_5$, (b) Pt$_5$Pd$_2$Cu$_5$ and (c) Pt$_5$Pd$_3$Cu$_5$.

**Fig. S7** $N_2$ adsorption-desorption isotherms and (insert) pore size distribution curves of Pt$_5$Cu$_5$. 
Fig. S8 CV curves of Pt₅PdCu₅ NSs recorded during the first 20 cycles at scan rate of 50 mV s⁻¹.

Fig. S9 CV curves measured in 0.5 M H₂SO₄ + 0.5 M CH₃OH at scan rate of 50 mV s⁻¹.