

Supporting Information for

One-pot Au@Pd Dendritic Nanoparticles as Electrocatalysts with Ethanol Oxidation Reaction

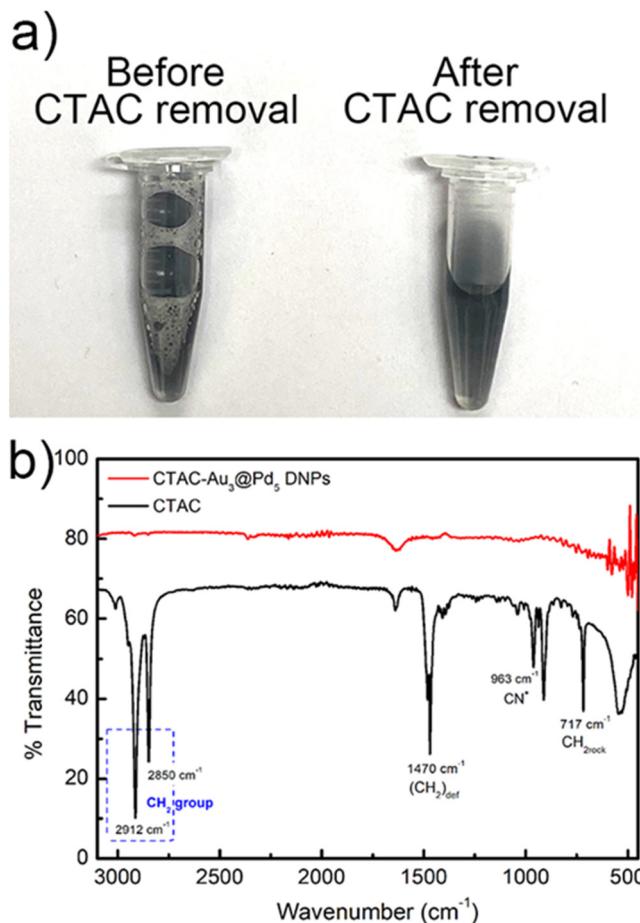


Figure S1. Before and after CTAC removal image of (a) Au₃@Pd₅ DNP and (b) IR data of CTAC-Au₃@Pd₅ DNP.

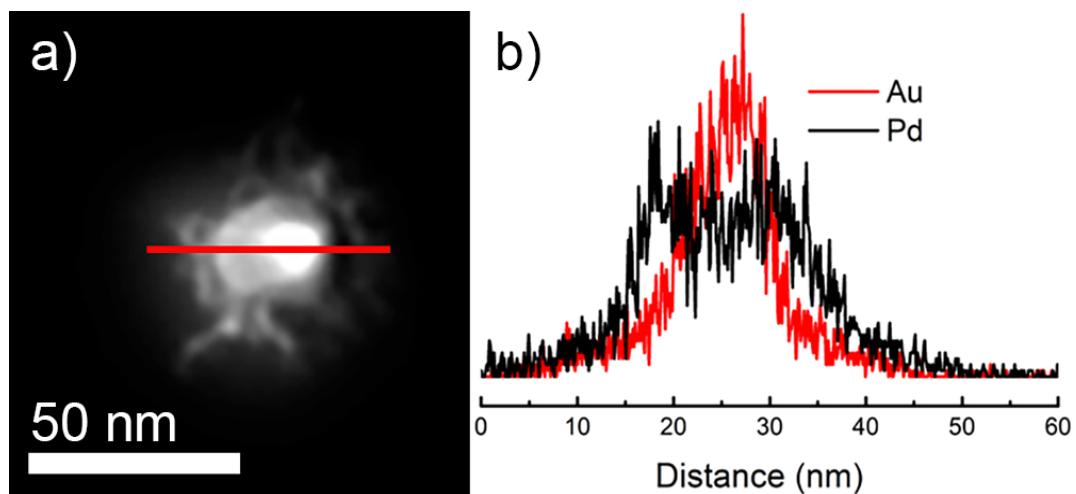


Figure S2. (a) HAADF-STEM image and (b) cross-sectional compositional line profiles of Au₃@Pd₅ DNP.

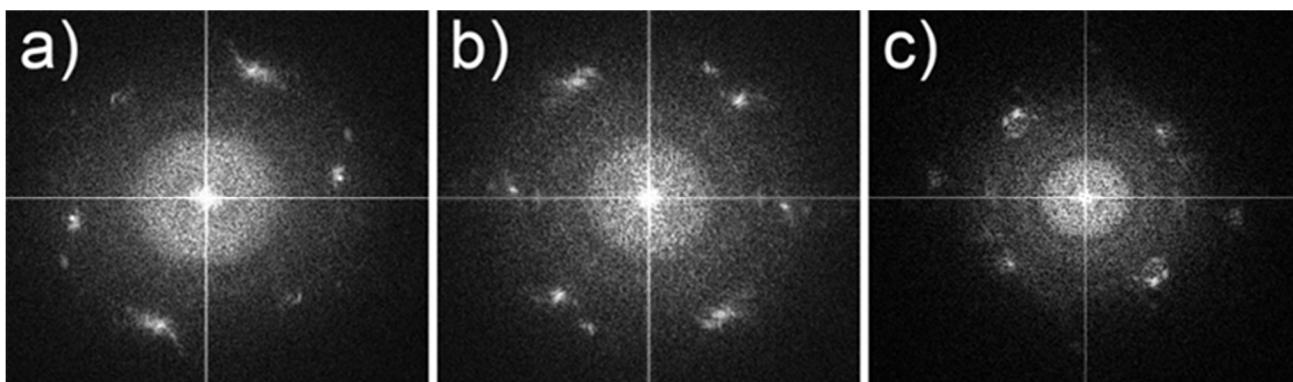


Figure S3. FFT pattern images of (a) $\text{Au}_3@\text{Pd}_5$, (b) $\text{Au}_1@\text{Pd}_1$ and (c) $\text{Au}_3@\text{Pd}_3$ DNP s.

Table S1. Comparison of electrocatalytic activities of various catalysts for EOR in alkaline media.

Catalyst	Electrolyte condition	Mass activity (mA mg^{-1})	Scan rate (mV s^{-1})	Reference
Au@Pd DNP s	0.1 M KOH + 0.5 M ethanol	2268	50	This Work
Nanowire PdPt	0.5 M NaOH + 1 M ethanol	950	50	[1]
Pd-Ni-P NPs	0.1 M KOH 0.5 M ethanol	110	10	[2]
AuPd@Pd CSNF	0.5 M KOH 0.5 M ethanol	1300	50	[3]
AuPd bimetal NPs	1 M NaOH + 0.6M ethanol	1065	50	[4]
AuPd nanowire	1 M KOH + 0.1 M ethanol	1400	20	[5]
Au-Island-Covered Pd Nanotubes	1 M KOH + 1 M ethanol	966	50	[6]
Au@Pd CNBs	0.1 M KOH + 0.5 M ethanol	800	50	[7]
Au@FePd nanoparticles	1 M KOH + 1 M ethanol	1350	50	[8]
Se-supported Au/Pd NPs	1 M KOH + 1 M ethanol	1200	50	[9]
AuPd CNT	1 M KOH + 1 M ethanol	1100	50	[10]

Reference

- Zhu, C.; Guo, S.; Dong, S. PdM (M= Pt, Au) bimetallic alloy nanowires with enhanced electrocatalytic activity for electro-oxidation of small molecules. *Adv. Mater.* **2012**, *24*, 2326–2331.
- Jiang, R.; Tran, D. T.; McClure, J. P.; Chu, D. A class of (Pd–Ni–P) electrocatalysts for the ethanol oxidation reaction in alkaline media. *ACS Catal.* **2014**, *4*, 2577–2586.
- Qiu, X.; Dai, Y.; Tang, Y.; Lu, T.; Wei, S.; Chen, Y. One-pot synthesis of gold–palladium@ palladium core–shell nanoflowers as efficient electrocatalyst for ethanol electrooxidation. *J. Power. Sources.* **2015**, *278*, 430–435.
- Zhang, L.F.; Zhong, S.L.; Xu, A.W. Highly branched concave Au/Pd bimetallic nanocrystals with superior electrocatalytic activity and highly efficient SERS enhancement. *Angew. Chem. In. Ed.* **2013**, *52*, 645–649.
- Wang, L.; Liu, Z.; Zhang, S.; Li, M.; Zhang, Y.; Li, Z.; Tang, Z. In situ assembly of ultrafine AuPd nanowires as efficient electrocatalysts for ethanol electroxidation. *Int. J. Hydrogen Energy* **2021**, *46*, 8549–8556.
- Yang, Y.; Jin, L.; Liu, B.; Kerns, P.; He, J. Direct growth of ultrasmall bimetallic AuPd nanoparticles supported on nitrated carbon towards ethanol electroxidation. *Electrochim. Acta* **2018**, *269*, 441–451.
- Zhang, G.; Liu, Z.; Xiao, Z.; Huang, J.; Li, Q.; Wang, Y.; Sun, D. Ni_2P -graphite nanoplatelets supported Au–Pd core–shell nanoparticles with superior electrochemical properties. *J. Phys. Chem. C* **2015**, *119*, 10469–10477.
- Cai, K.; Liao, Y.; Zhang, H.; Liu, J.; Lu, Z.; Huang, Z.; Han, H. Controlled synthesis of Au-island-covered Pd nanotubes with abundant heterojunction interfaces for enhanced electroxidation of alcohol. *ACS Appl. Mater. Interfaces* **2016**, *8*, 12792–12797.
- Wang, W.; Zhang, J.; Yang, S.; Ding, B.; Song, X. Au@ Pd core–shell nanobricks with concave structures and their catalysis of ethanol oxidation. *ChemSusChem*, **2013**, *6*, 1945–1951.

10. Caglar, A.; Kivrak, H. Highly active carbon nanotube supported PdAu alloy catalysts for ethanol electrooxidation in alkaline environment. *Int. J. Hydrogen Energy* **2019**, *44*, 11734–11743.