Electronic supporting information

Facile synthesis of Rh-Pd alloy nanodendrites as highly active and durable electrocatalysts for oxygen reduction reaction

Yue Qi,[a,§] Jianbo Wu,[b,§] Hui Zhang,*[a] Yingying Jiang,[c] Chuanhong Jin,[c] Maoshen Fu,[d] Hong Yang,[b] and Deren Yang[a]

[a]*State Key Laboratory of Silicon Materials, Department of Materials Science and Engineering, and Cyrus Tang Center for Sensor Materials and Applications, Zhejiang University, Hangzhou, Zhejiang 310027, People's Republic of China*

[b]*Department of Chemical & Biomolecular Engineering, University of Illinois at Urbana-Champaign, 600 South Mathews Avenue, 114 Roger Adams Laboratory, Urbana, Illinois 61801, USA*

[c]*State Key Laboratory of Silicon Materials, Key Laboratory of Advanced Materials and Applications for Batteries of Zhejiang Province, Department of Materials Science and Engineering, Zhejiang University, Hangzhou, 310027 P. R. China*

[d]*Shaanxi Materials Analysis and Research Center, School of Materials Science and Engineering, Northwestern Polytechnical University, Xi'an, Shaanxi 710072, People's Republic of China*

[§]*These authors contributed equally to this work*

[*]*To whom correspondence should be addressed. Fax: 86-571-87952322; Tel: 86-571-87953190; E-mail: msezhanghui@zju.edu.cn*

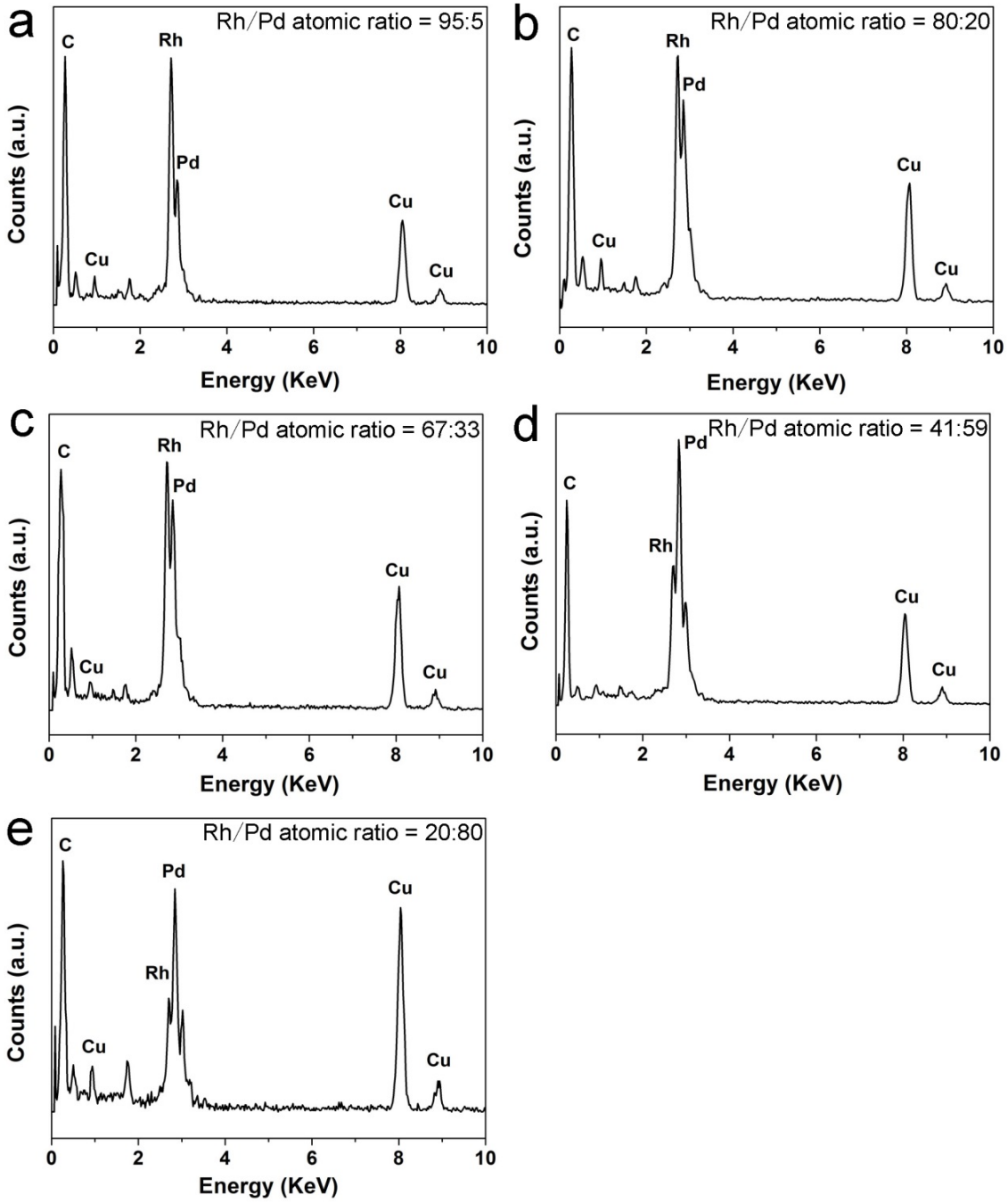

Figure S1. EDX spectra of Rh-Pd alloy nanocrystals prepared using the standard procedure, except for the different molar ratios of Rh and Pd salt precursors added in the synthesis: (a) 18:1, (b) 6:1, (c) 2:1, (d) 1:1.5, and (e)1:5.

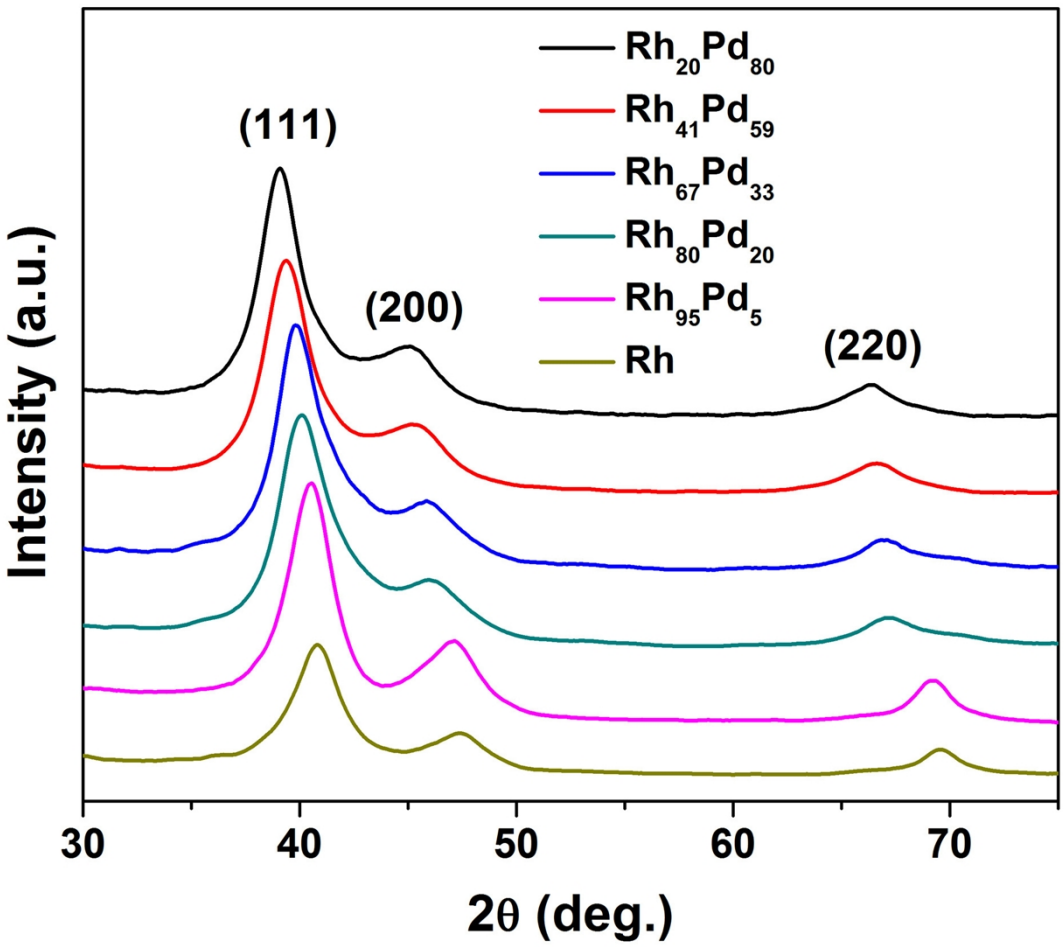

Figure S2. XRD patterns of Rh-Pd alloy nanocrystals with different compositions, including pure Rh.

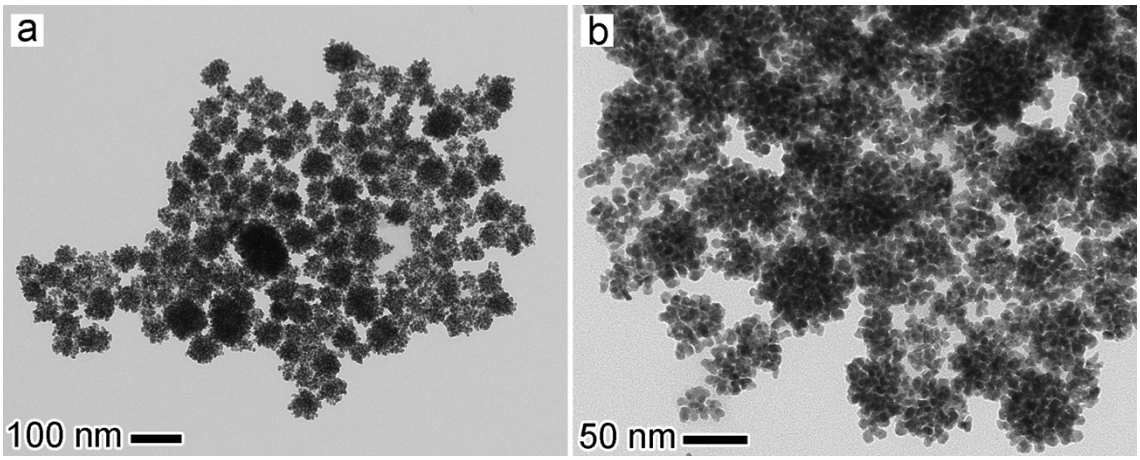

Figure S3. TEM micrographs of Pd spherical aggregations prepared using the standard procedure, except for the absence of Rh salt precursor in the reaction.

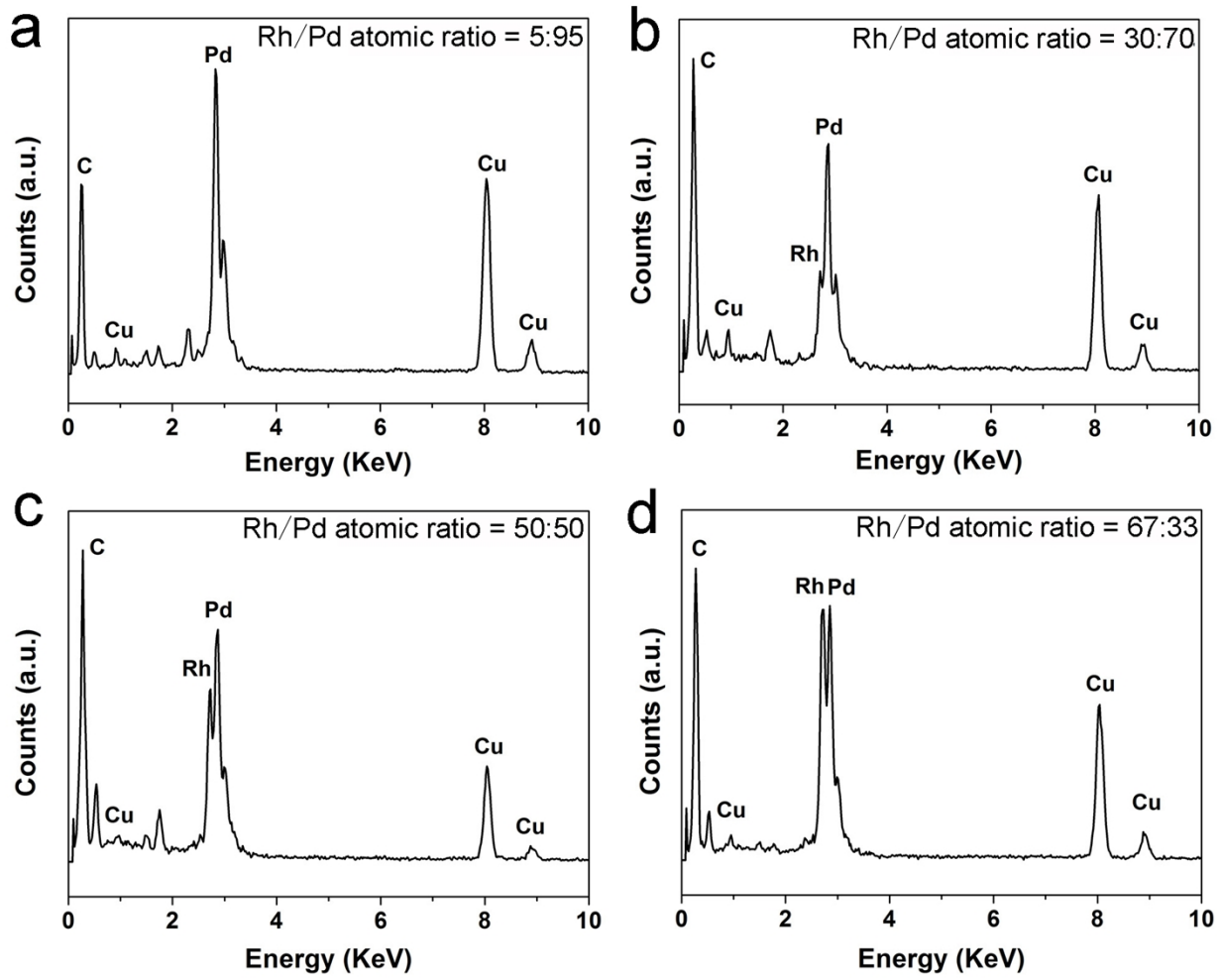

Figure S4. EDX spectra of the sample that were obtained using the standard procedure, except for the different period of times: (a) 5 min, (b) 30 min, (c) 1 h, and (d) 3h.

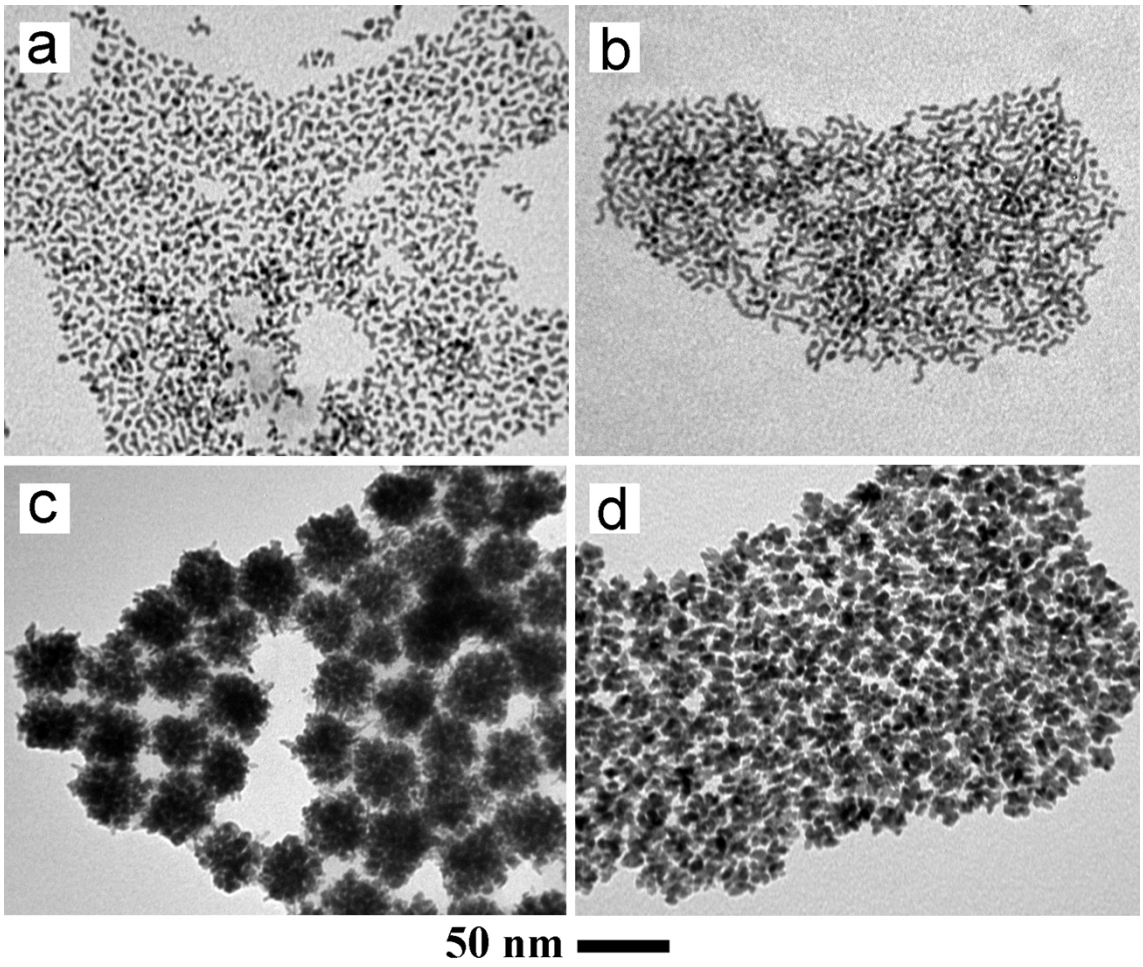

Figure S5. TEM images of the Rh-Pd nanocrystals prepared using the standard procedure, except the difference in the reaction temperature: (a) 140, (b) 160, (c) 180, and (d) 220 °C.

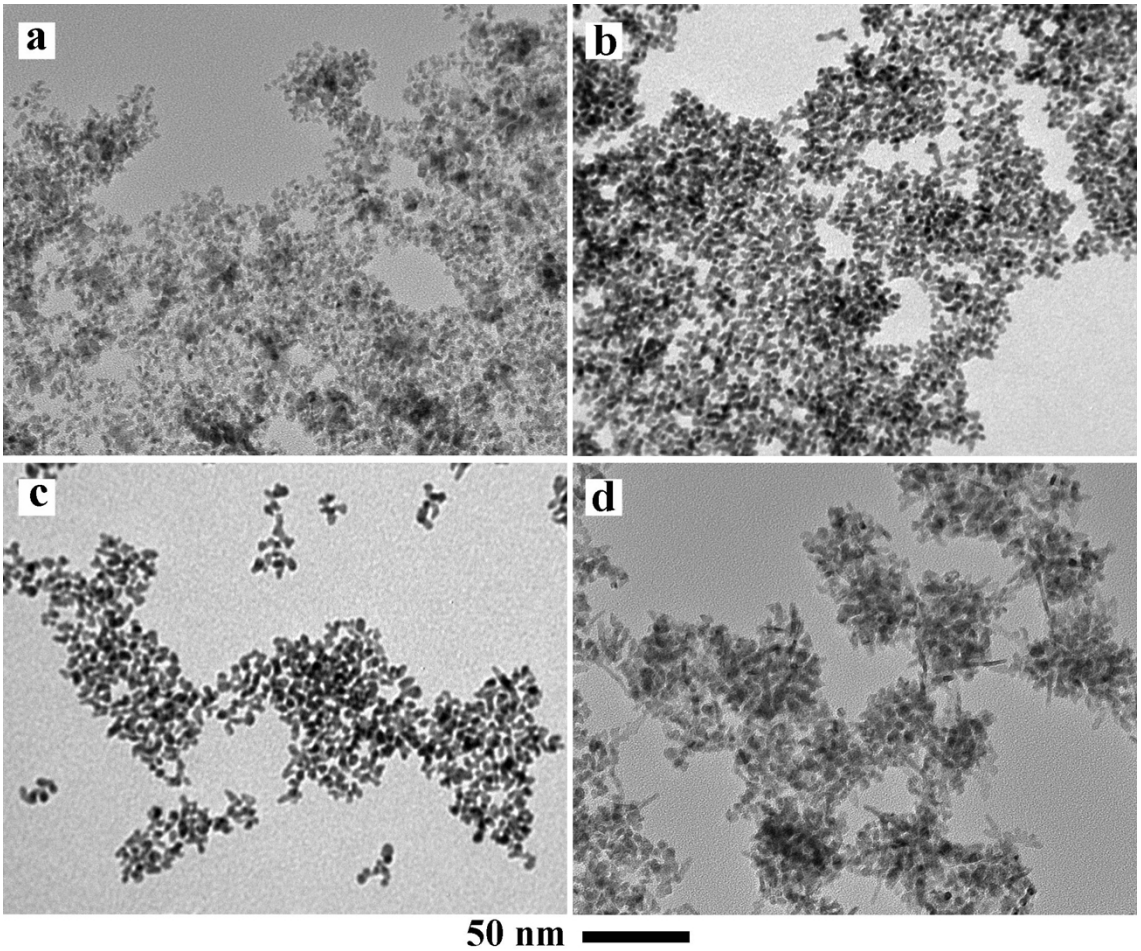

Figure S6. TEM images of the Rh-Pd nanocrystals prepared using the standard procedure, except for the different amounts of CTAB or CTAC: (a) in the absence of CTAB, (b) 50 mg of CTAB, (c) 120 mg of CTAB, and (d) 300 mg CTAC.

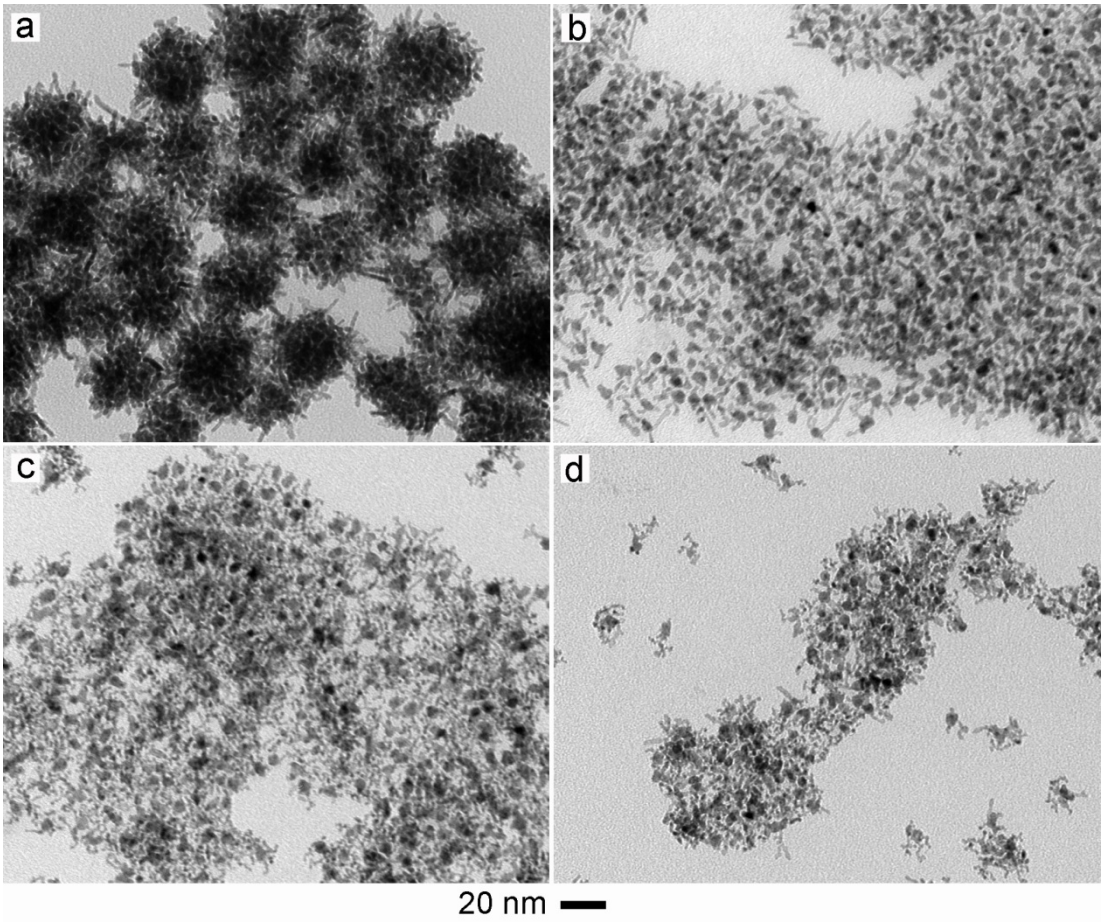

Figure S7. TEM images of the Rh-Pd nanocrystals prepared using the standard procedure, except for the different volume ratios of OAm and ODE: (a) 3:1, (b) 1:1, (c) 1:3, (d) 1:7.

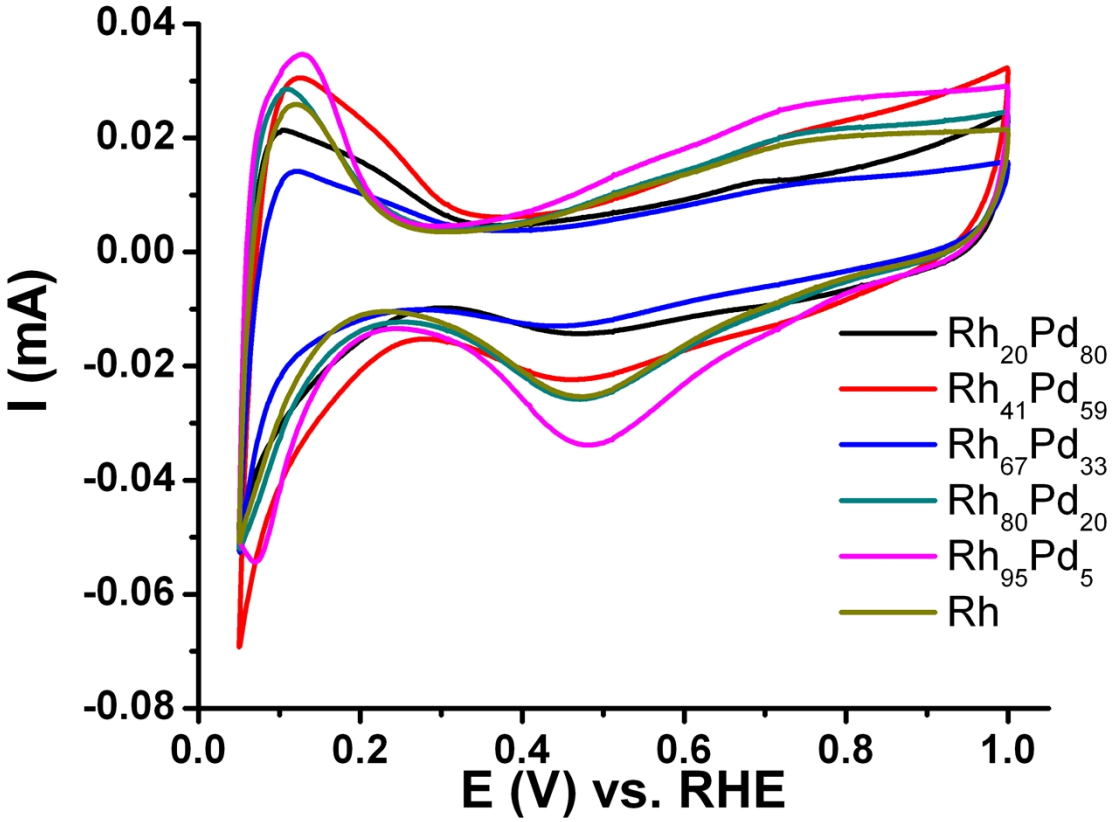

Figure S8. CV curves of the Rh-Pd and Rh dendrite nanocrystals.

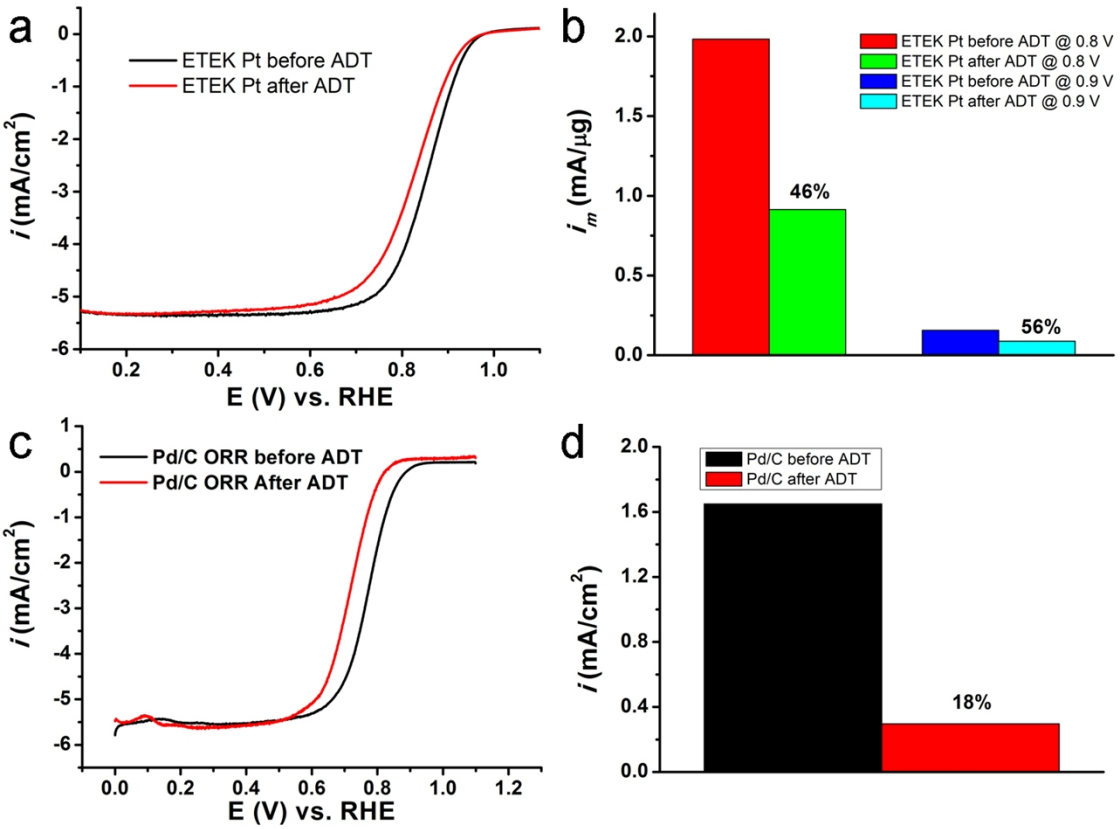

Figure S9. ORR stabilities of the commercial E-TEK Pt/C (a, b) and Pd/C (c, d) after ADT in 0.1 M KOH for 10,000 cycles.

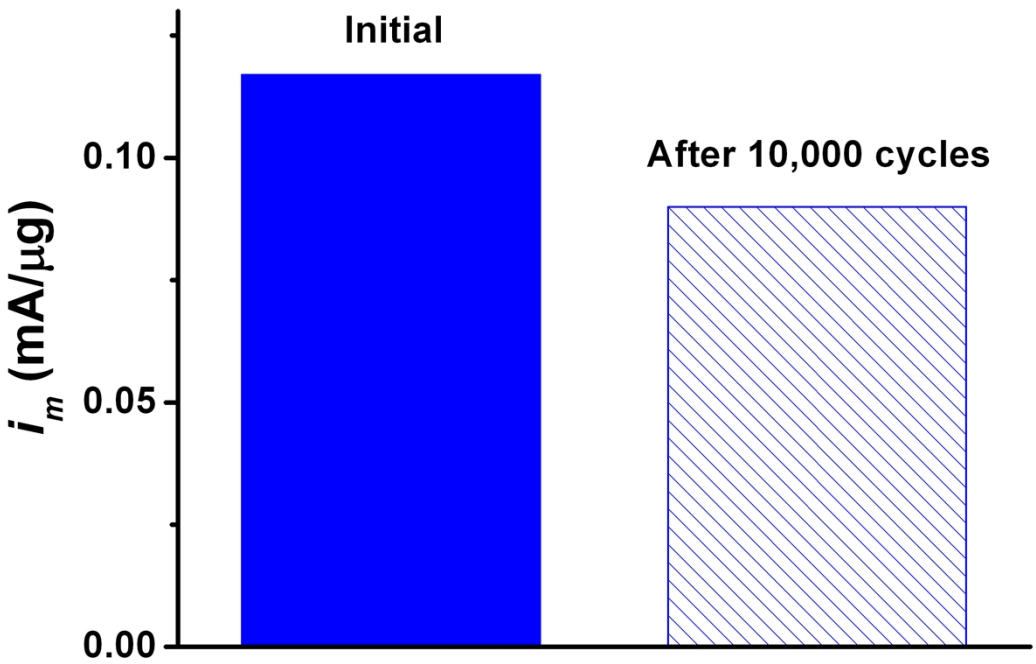

Figure S10. ORR stability of Rh in 0.1 M KOH after 10,000 cycles ADT.