Supporting Information

Octahedral Pt-Pd Alloy Catalysts with Enhanced Oxygen Reduction Activity and Stability in Proton Exchange Membrane Fuel Cells

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**Additional Data**

**Figure S1**: TEM images of as-synthesized octahedral Pt-Pd alloy NPs

**Figure S2**: Particle size histograms of as-prepared NPs

**Figure S3**: CVs of as-prepared catalysts

**Figure S4**: ORR polarization curves of as-prepared catalysts

**Figure S5**: TEM images of S-Pt₃Pd₁/C

**Figure S6**: ORR polarization curves of S-Pt₃Pd₁/C

**Figure S7**: TEM images of Octa-Pt₃Pd₁/C before and after durability test

**Figure S8**: TEM images of S-Pt₃Pd₁/C before and after durability test

**Figure S9**: TEM images of Pt/C before and after durability test
Figure S1. TEM images of octahedral Pt$_3$Pd$_1$ (a); Pt$_1$Pd$_1$ (d); and Pt$_1$Pd$_3$ (g) NPs. TEM images of as-prepared Pt-Pd deposited on carbon black (Vulcan XC-72R): Pt$_3$Pd$_1$/C (b), Pt$_1$Pd$_1$/C (e), and Pt$_1$Pd$_3$/C (h). EDX spectra of as-synthesized Pt-Pd alloy NPs: Pt$_3$Pd$_1$ (c), Pt$_1$Pd$_1$ (f), and Pt$_1$Pd$_3$ (i).

Figure S2. Particle size histograms of Pt$_3$Pd$_1$/C (a), Pt$_1$Pd$_1$/C (b), Pt$_1$Pd$_3$/C (c), and Pt/C (d).
**Figure S3.** CVs of octahedral Pt-Pd alloy catalysts and Pt/C in Ar-saturated 0.1 M HClO$_4$ with a scan rate of 50 mV s$^{-1}$ at 25 °C.

**Figure S4.** ORR polarization curves of Pt/C (a), Pt$_3$Pd$_1$/C (b), Pt$_1$Pd$_3$/C (c), and Pt$_1$Pd$_3$/C (d) in O$_2$-saturated 0.1 M HClO$_4$ solution by sweeping the potential from 0.8 to 0 V with a scan rate of 5 mV s$^{-1}$.
Figure S5. (a) and (b) TEM images of the spherical Pt₃Pd₁ NPs deposited on Vulcan XC-72R (S-Pt₃Pd₁/C). (c) Size distribution and (d) EDX spectra of spherical Pt₃Pd₁ alloy NPs.

Figure S6. ORR polarization curves of S-Pt₃Pd₁/C in O₂-saturated 0.1 M HClO₄ solution by sweeping the potential from 0.8 to 0 V with a scan rate of 5 mV s⁻¹.
**Figure S7.** TEM images and particle size histograms of Octa-Pt$_3$Pd$_1$/C before (a-c) and after (d-f) durability test.

**Figure S8.** TEM images and particle size histograms of S-Pt$_3$Pd$_1$/C before (a-c) and after (d-f) durability test.
**Figure S9.** TEM images and particle size histograms of Pt/C before (a-c) and after (d-f) durability test.