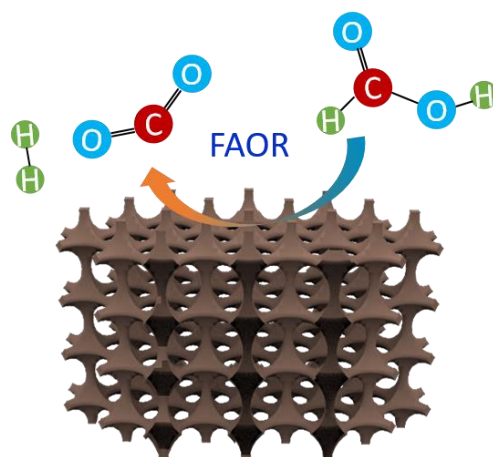


Supplementary Information

Table S1. FAOR Activity comparisons of RuPd₃ ANs with the previously reported catalysts.

Catalysts	Electrolyte	Mass Activity (mA/mg _{noble metal})	Oxidation potential (V vs RHE)	Ref
RuPd ₃ ANs	0.5 M HCCOH + 0.5 M H ₂ SO ₄	2068.4	0.440	This work
PdCu ANCs	0.5 M HCCOH + 0.5 M H ₂ SO ₄	554.53	0.442	[44]
Pd NBs	0.5 M HCCOH + 0.5 M H ₂ SO ₄	464	0.5	[11]
Pd ₃ Pt	0.5 M HCCOH + 0.5 M H ₂ SO ₄	318	0.34	[29]
Pd-PNRs	0.5 M HCCOH + 0.5 M H ₂ SO ₄	295.69	0.432	[49]
Pd-NDAs	0.5 M HCCOH + 0.5 M H ₂ SO ₄	451.6	0.262	[50]
Pd HPNSs	0.5 M HCCOH + 0.5 M H ₂ SO ₄	203.2	0.392	[51]
PdRu NPAs	0.5 M HCCOH + 0.5 M H ₂ SO ₄	1950	> 0.6	[30]
Pd nanosheets	0.5 M HCCOH + 0.5 M H ₂ SO ₄	409.3	0.398	[52]
Pd ₅₃ Cu ₄₇	0.5 M HCCOH + 0.5 M H ₂ SO ₄	430	0.522	[53]
Pd ₃₆ P ₂₅ @Pt ₃₉ /C	0.5 M HCCOH + 0.5 M H ₂ SO ₄	502	0.6	[54]
PdRu	0.5 M HCCOH + 0.5 M H ₂ SO ₄	190	0.522	[55]
Pd ₅₁ Cu ₄₉	0.5 M HCCOH + 0.5 M H ₂ SO ₄	517	0.422	[56]
D-PdBi/C	0.5 M HCCOH + 0.5 M H ₂ SO ₄	≈ 1035	> 0.5	[57]
Pd-P/C	0.5 M HCCOH + 0.5 M H ₂ SO ₄	57.06	0.392	[58]
Pd ₃ Sn/C-500.	0.5 M HCCOH + 0.5 M H ₂ SO ₄	≈ 600	0.5	[59]
Au ₇₁ @Pd ₂₉ DCS	0.5 M HCCOH + 0.5 M H ₂ SO ₄	642	0.452	[2]
Pd ₃ Co/CNT	0.5 M HCCOH + 0.5 M H ₂ SO ₄	1964	0.482	[10]
PdRuBP	0.5 M HCCOH + 0.5 M H ₂ SO ₄	1710	≈ 0.45	[60]
PdNi/C	0.5 M HCCOH + 0.5 M H ₂ SO ₄	≈ 450	> 0.4	[61]



Scheme S1. Schematic diagram of the electrocatalytic FAOR of RuPd₃ ANs.

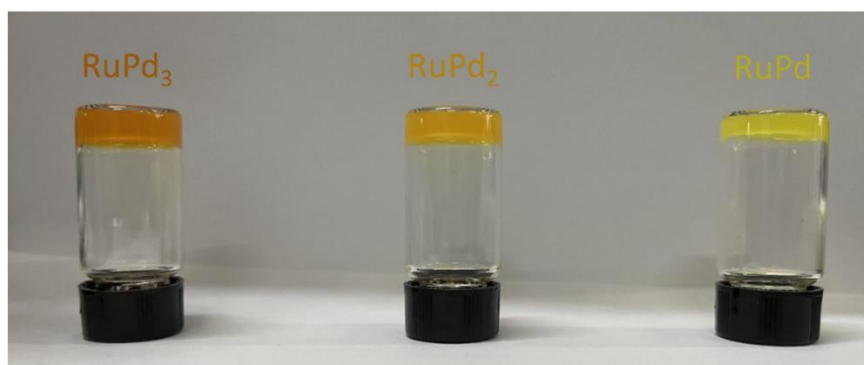


Figure S1. Photographs of Pd_x[Ru(CN)₆]_y·aH₂O cyanogels with different Pd/Ru ratio.

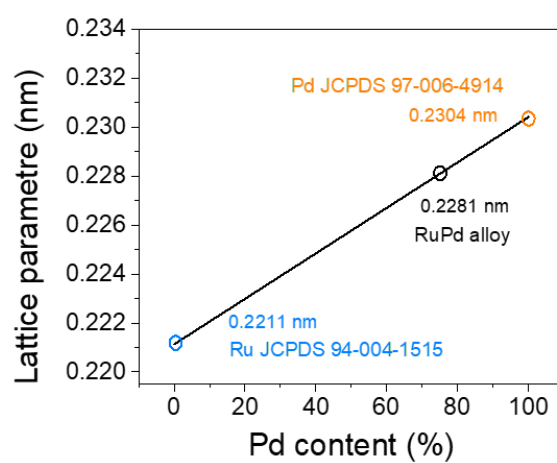


Figure S2. The plot of lattice parameter versus Pd atomic percentage of RuPd₃ ANs.

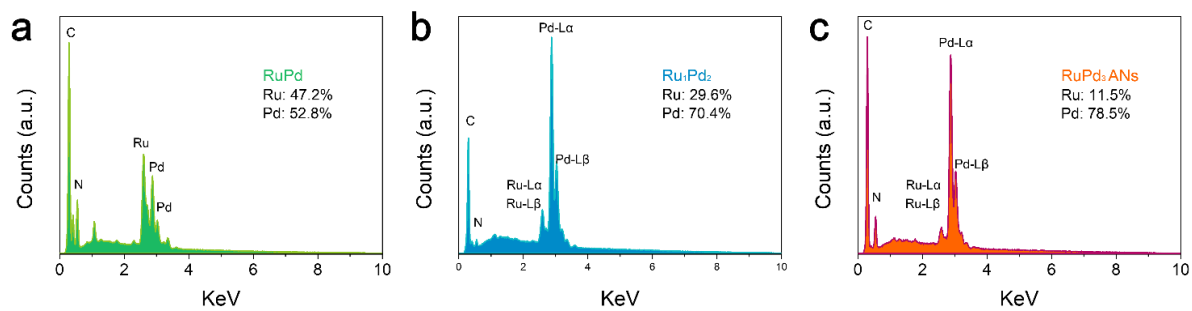


Figure S3. EDS spectrum of (a) RuPd; (b) RuPd₂ and; (c) RuPd₃ ANs, respectively.

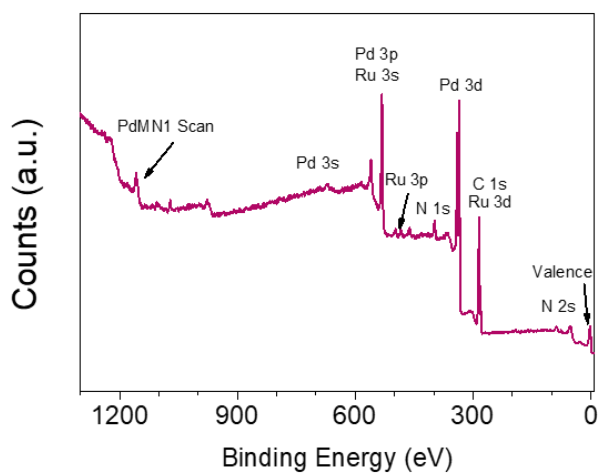


Figure S4. XPS survey spectrum of RuPd₃ ANs.

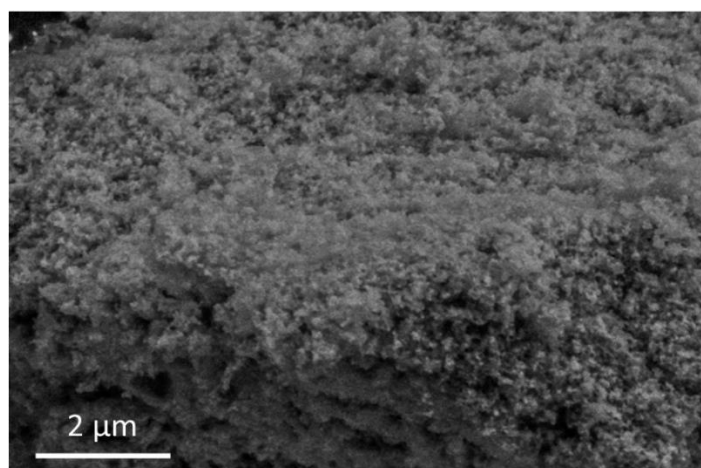


Figure S5. Large-scale SEM image of RuPd₃ ANs.

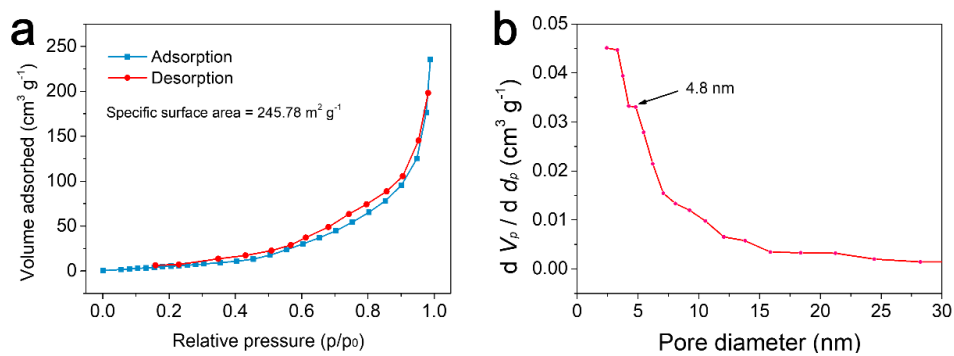


Figure S6. (a) N₂ adsorption-desorption isotherms and; (b) Brunauer-Emmett-Teller (BET) pore size distribution calculated of RuPd₃ ANs.

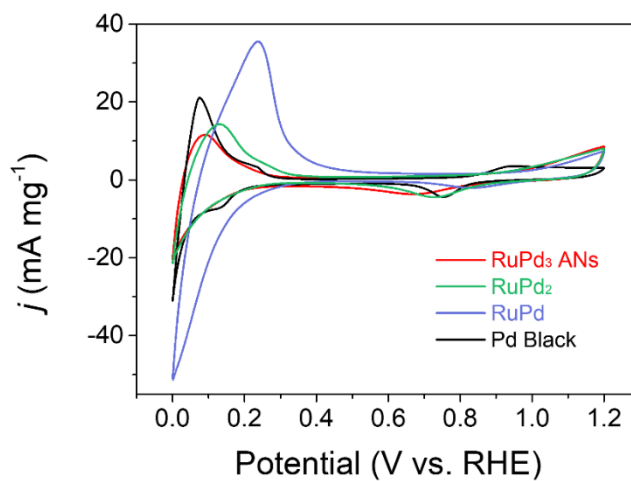


Figure S7. Cyclic voltammetry curves of RuPd₃ ANs, RuPd₂, RuPd and Pd black in 0.5 M H₂SO₄ solution.

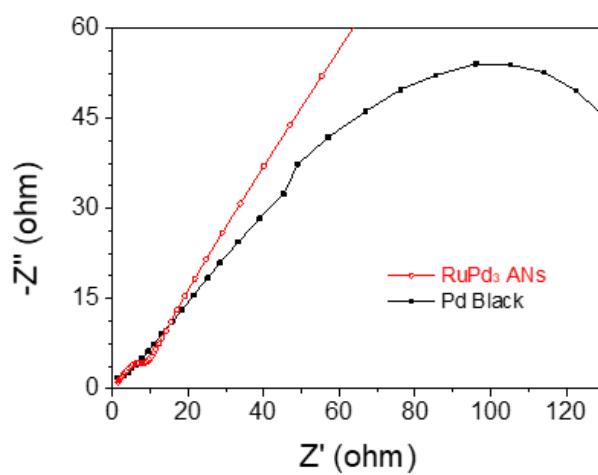


Figure S8. Nyquist curves of RuPd₃ ANs and Pd Black in 0.5 M H₂SO₄ + 0.5 M HCOOH electrolyte.

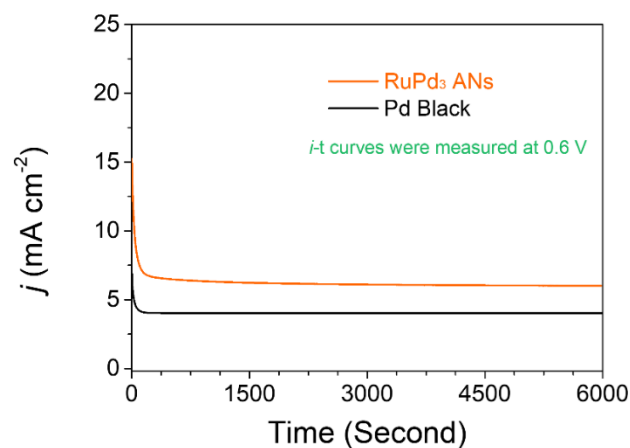


Figure S9. Chronoamperometric curves obtained at 0.6 V (vs RHE) in N₂-saturated 0.5 M H₂SO₄ + 0.5 M HCOOH solution.

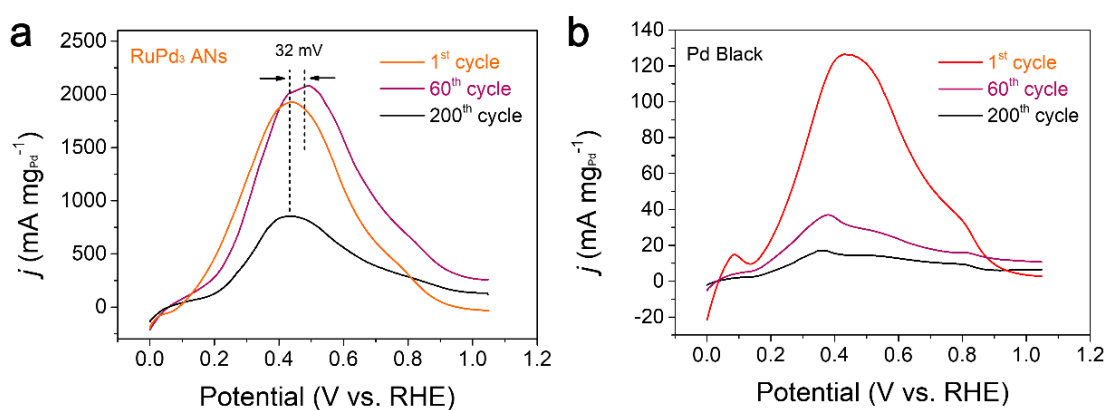


Figure S10. The 1st, 60th and 200th FAOR curves for accelerated durability tests (ADTs) tests in N₂-saturated 0.5 M H₂SO₄ + 0.5 M HCOOH solution, compared (a) RuPd₃ ANs and (b) Pd black.

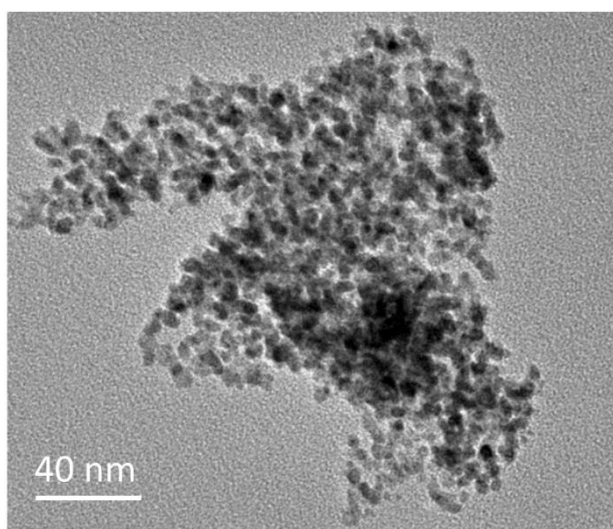


Figure S11. TEM image of RuPd₃ ANs after 200 cycles ADTs test.