

Supporting Information

Facile Aqueous-Phase Synthesis of Pd-FePt Core-Shell Nanoparticles for Methanol Oxidation Reaction

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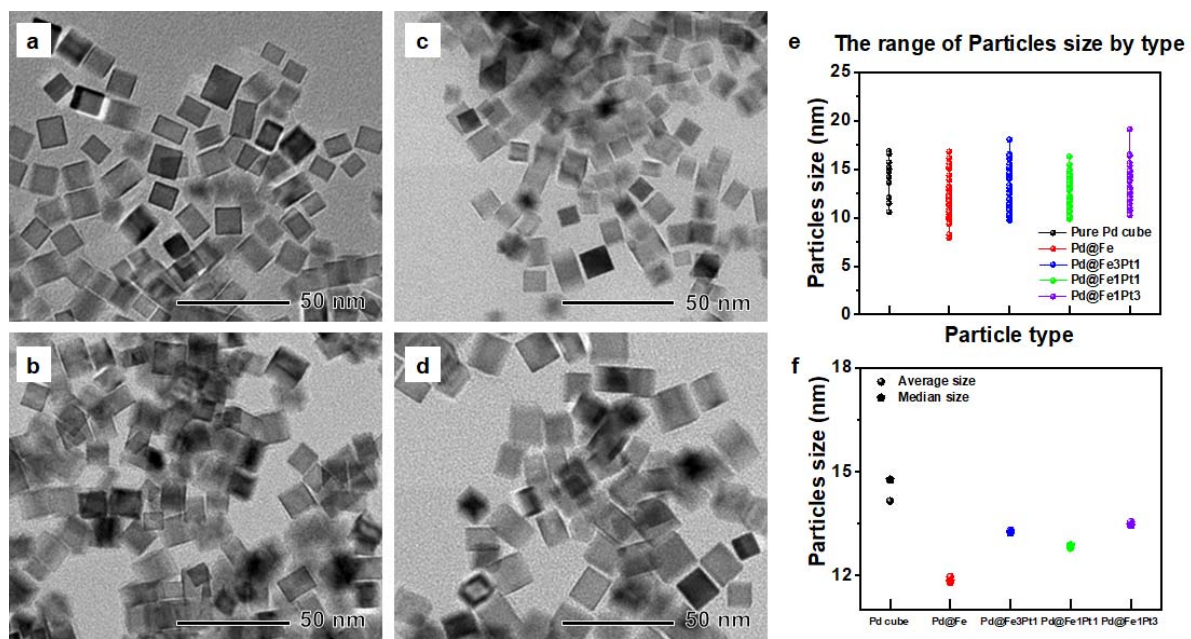


Figure S1. TEM images of the catalysts: (a) Pd@Fe; (b) Pd@FePt_{1/3}; (c) Pd@FePt_{1/1}; (d) Pd@FePt_{3/1}. (e,f) the size range and distribution.

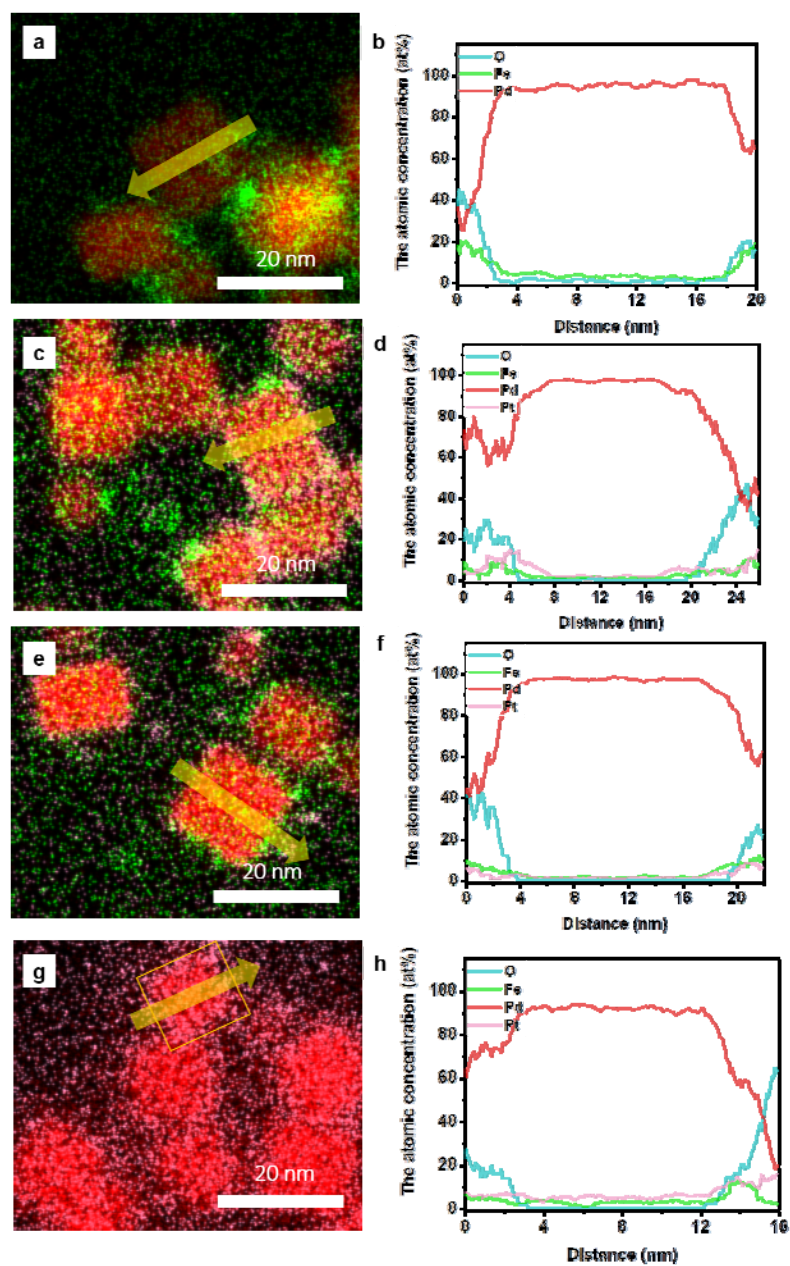


Figure S2. HAADF-STEM-EDS mapping images and EDS line scanning profiles. (a,b), Pd@Fe; (c,d), Pd@FePt_{3/1}; (e,f), Pd@FePt_{1/1}; (g,h) Pd@FePt_{1/3}.

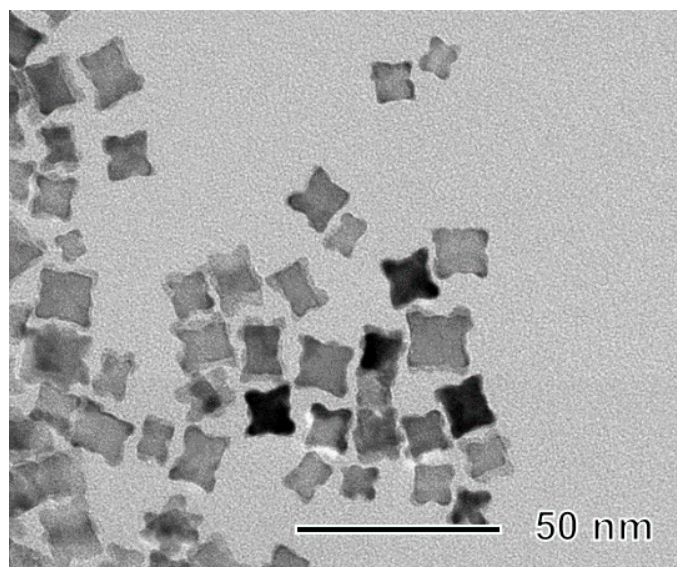


Figure S3. TEM image of Pd@FePt_{1/3} using AA instead of NaBH₄.

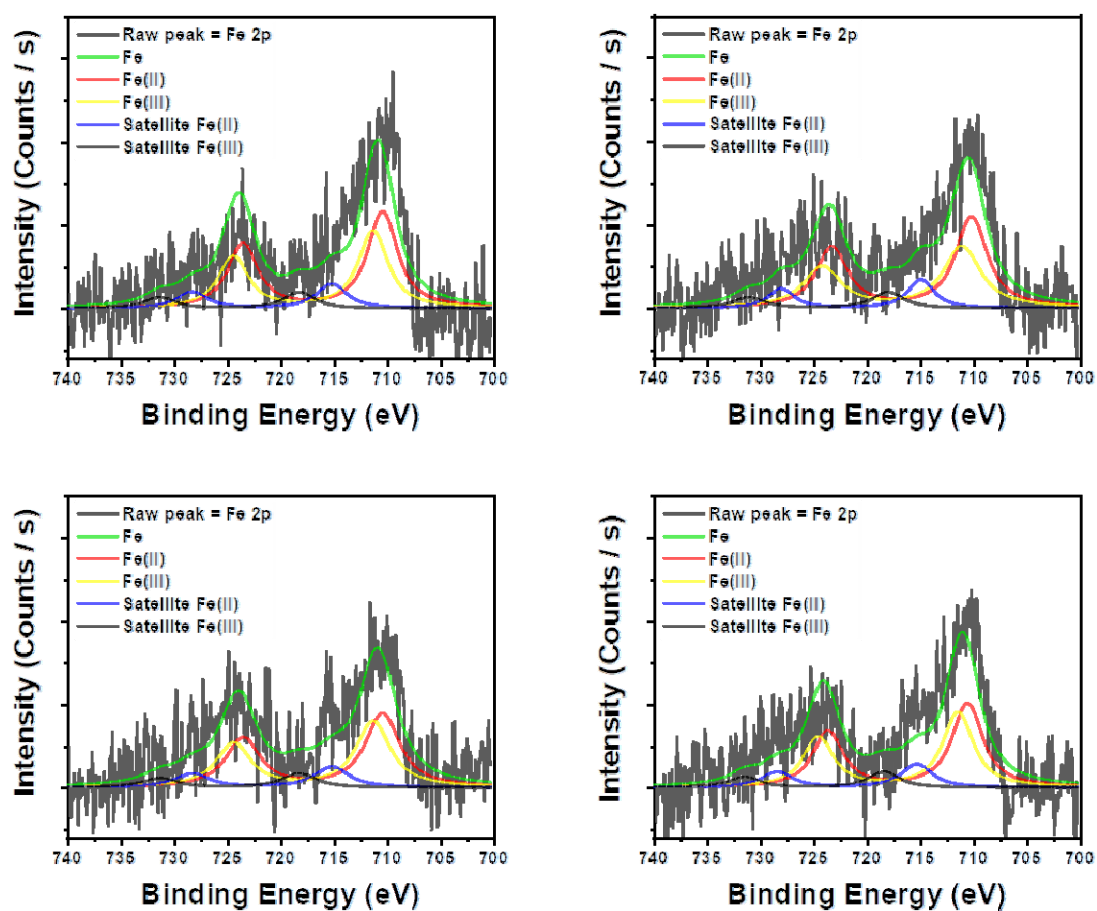


Figure S4. Fe 2p XPS peak differentiation-imitating analysis. (a) Pd@Fe; (b) Pd@FePt_{3/1}; (c) Pd@FePt_{1/1}; (d) Pd@FePt_{1/3}.

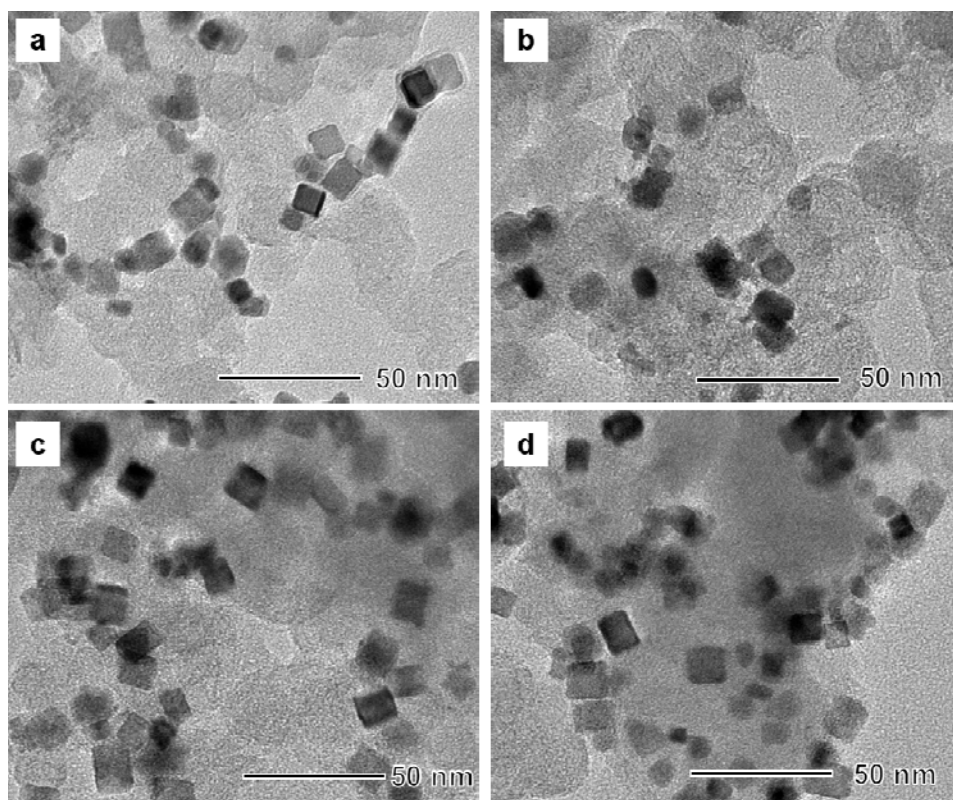


Figure S5. The TEM images of Pd@Fe and Pd@FePt with carbon. (a): Pd@Fe/C; (b): Pd@FePt_{3/1}/C; (c): Pd@FePt_{1/1}/C; (d): Pd@FePt_{1/3}/C.

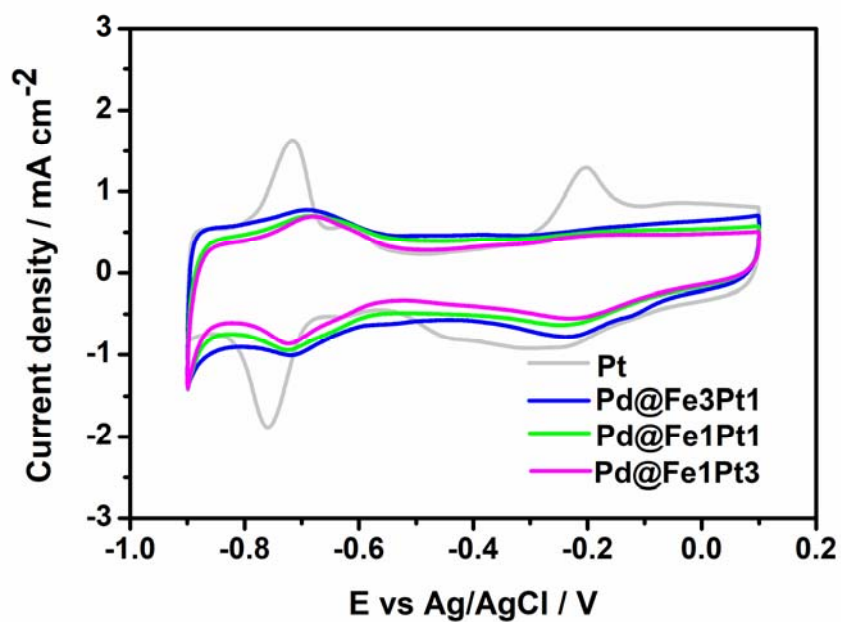


Figure S6. CV curves of Pd@FePt catalysts in an aqueous 1 M KOH solution. The scan rate was 50 mV s^{-1} , and the current density is based on the geometric area. The ECSAs of the catalysts were 68.3, 80.7, 57.1, and $46.9 \text{ m}^2 \text{ g}^{-1}$ for Pt/C, Pd@FePt_{3/1}, Pd@FePt_{1/1}, and Pd@FePt_{1/3}, respectively.

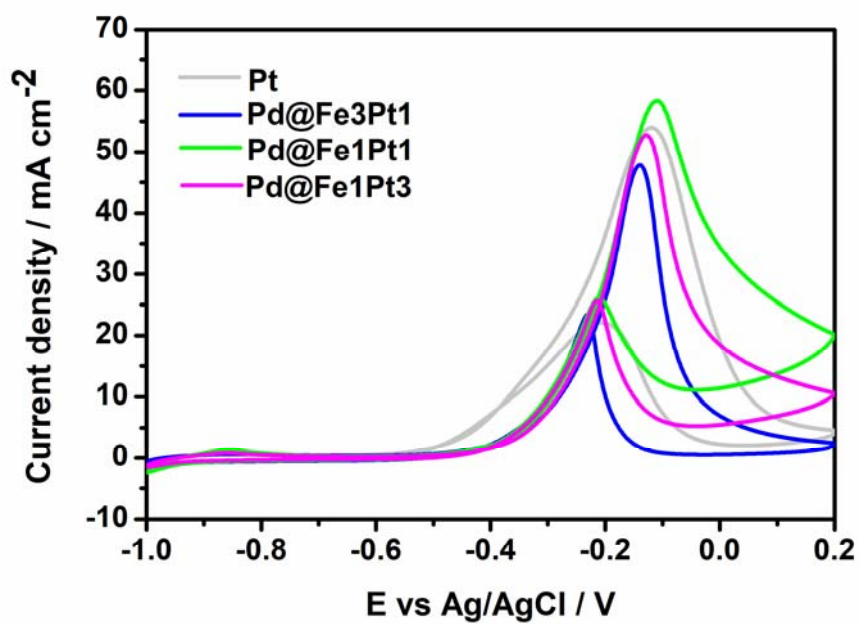


Figure S7. CV curves of Pd@FePt catalysts in an aqueous 1 M CH₃OH + 1 M KOH electrolyte. The scan rate was 50 mV s⁻¹, and the current density is based on the geometric area.

Table S1. ICP data of the Pd@Fe and Pd@FePt nanoparticles

Catalysts	Molar fraction of metal (%)				
	Pd	Fe	Pt	M _{Fe} /M _{Pd}	M _{Pt} /M _{Pd}
Pd@Fe	29.3	2.38		15.47%	
Pd@FePt_{3/1}	19.7	1.25	2.46	12.08%	6.81%
Pd@FePt_{1/1}	24.5	1.39	2.92	10.8%	6.50%
Pd@FePt_{1/3}	31.4	0.976	4.88	5.92%	8.48%

Table S2. ICP data of the Pd@Fe and Pd@FePt nanoparticles after carbon support

Catalysts	Molar fraction of metal (%)				
	Pd	Fe	Pt	M _{Fe} /M _{Pd}	M _{Pt} /M _{Pd}
Pd@Fe/C	4.44	0.225	/	9.65%	/
Pd@FePt_{3/1}/C	5.33	0.216	0.433	7.72%	4.43%
Pd@FePt_{1/1}/C	18.4	0.556	1.71	5.76%	5.07%
Pd@FePt_{1/3}/C	14.3	0.175	1.69	2.33%	6.44%