

Electronic supporting information

Facile synthesis of Pd-Pt alloy concave nanocubes with high-index facets as electrocatalysts for methanol oxidation

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Table S1. ICP-AES data, ECSA, concave cube proportion of the carbon supported Pd-Pt alloy nanocrystals with different Pd/Pt atomic ratios, including commercial Pt/C.

Catalysts with different Pd/Pt molar ratios	Pd/Pt atomic ratio	molecular formula	Proportion of concave cube	ECSA (m ² /g _{metal})
Sample 1 (1:4)	1:1.5	Pd ₄₀ Pt ₆₀	100%	2.2
Sample 2 (1:2)	1:1	Pd ₅₀ Pt ₅₀	100%	2.0
Sample 3 (1:1)	1:0.51	Pd ₆₆ Pt ₃₄	96%	2.2
Sample 4 (2:1)	2.8:1	Pd ₇₄ Pt ₂₆	84%	2.8
Sample 5 (4:1)	5.05:1	Pd ₈₃ Pt ₁₇	42%	2.6
Pt/C*	/	/	/	20.3

*20 wt% Pt on carbon black, Alfa Aesar.

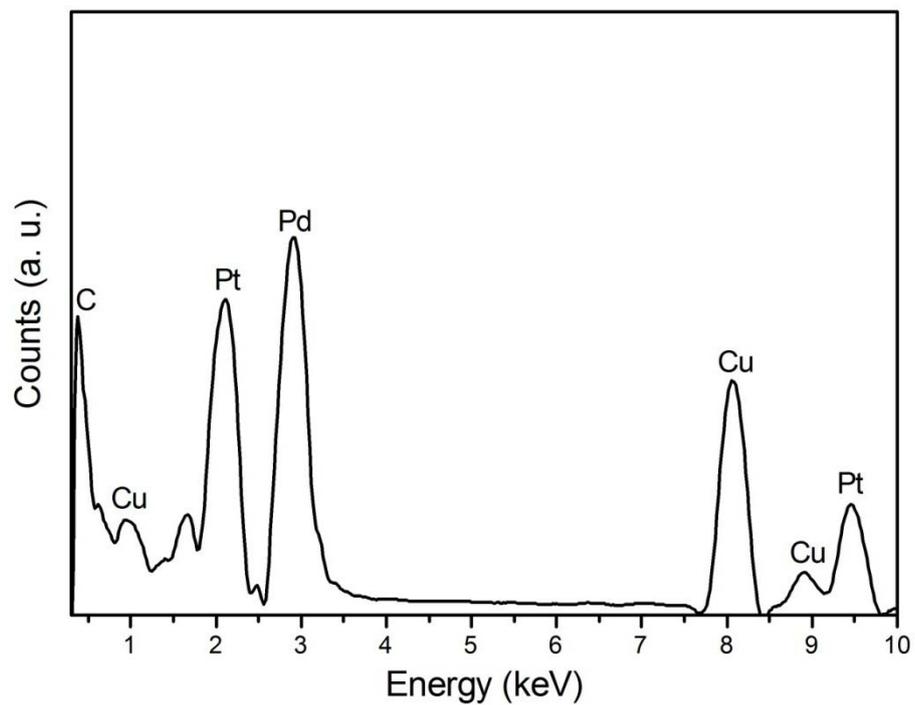


Figure S1. EDX spectrum of the Pd-Pt alloy concave nanocubes prepared using the standard procedure.

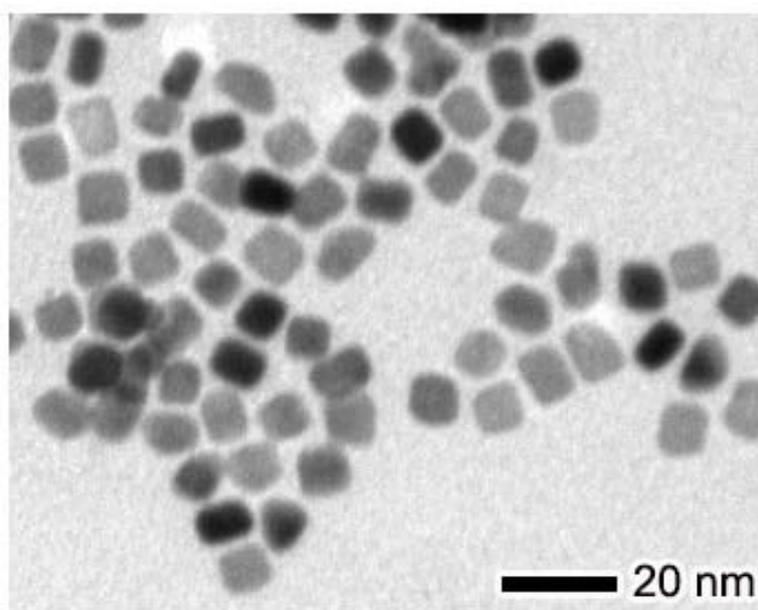


Figure S2. TEM image of Pd-Pt nanocrystals prepared using the standard procedure, except for replacing H_2PtCl_6 with K_2PtCl_4 .

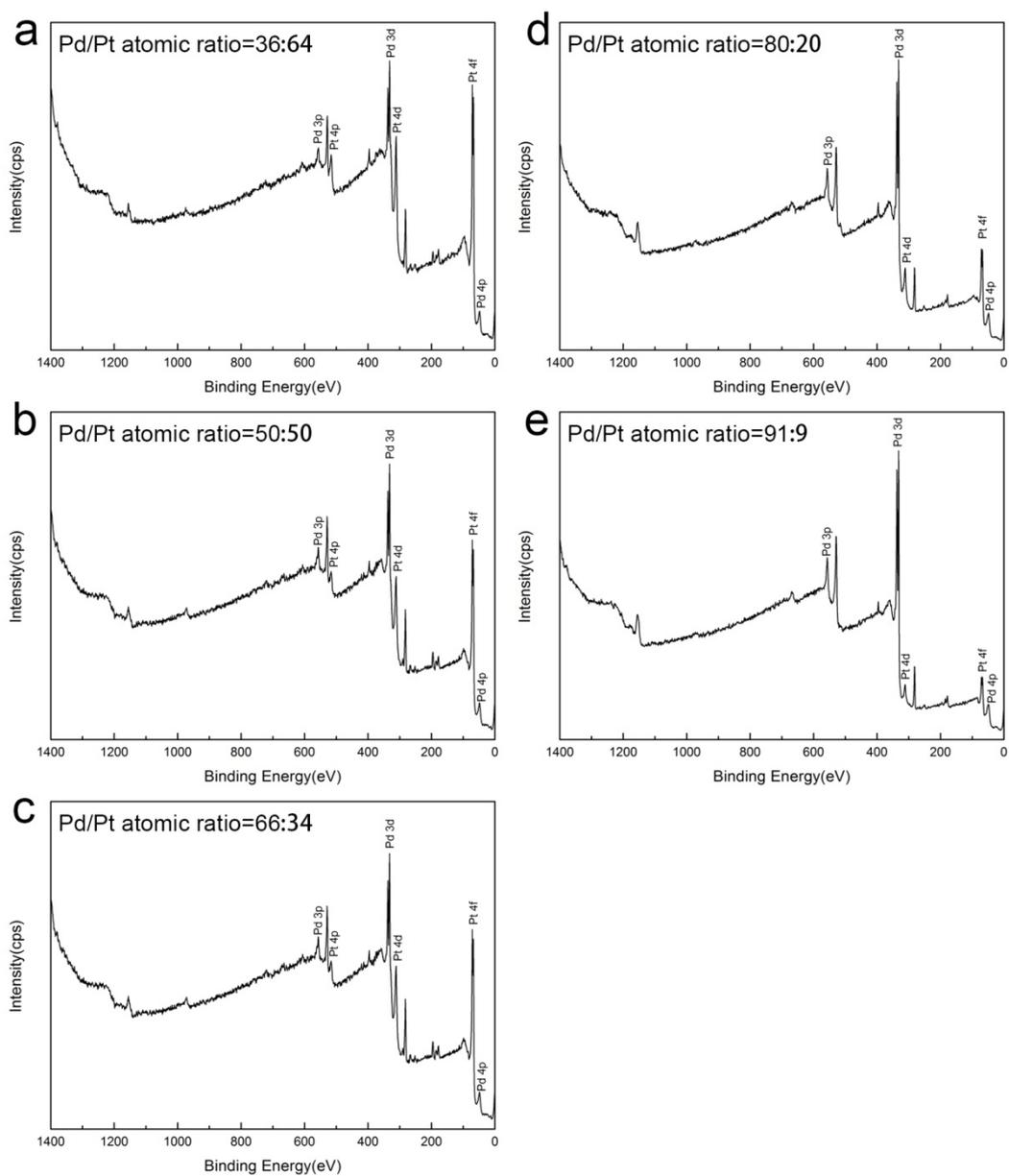


Figure S3. XPS data of the Pd-Pt alloy concave nanocubes with five different Pd/Pt atomic ratios: (a) Pd₄₀Pt₆₀, (b) Pd₅₀Pt₅₀, (c) Pd₆₆Pt₃₄, (d) Pd₇₄Pt₂₆, and (e) Pd₈₃Pt₁₇.

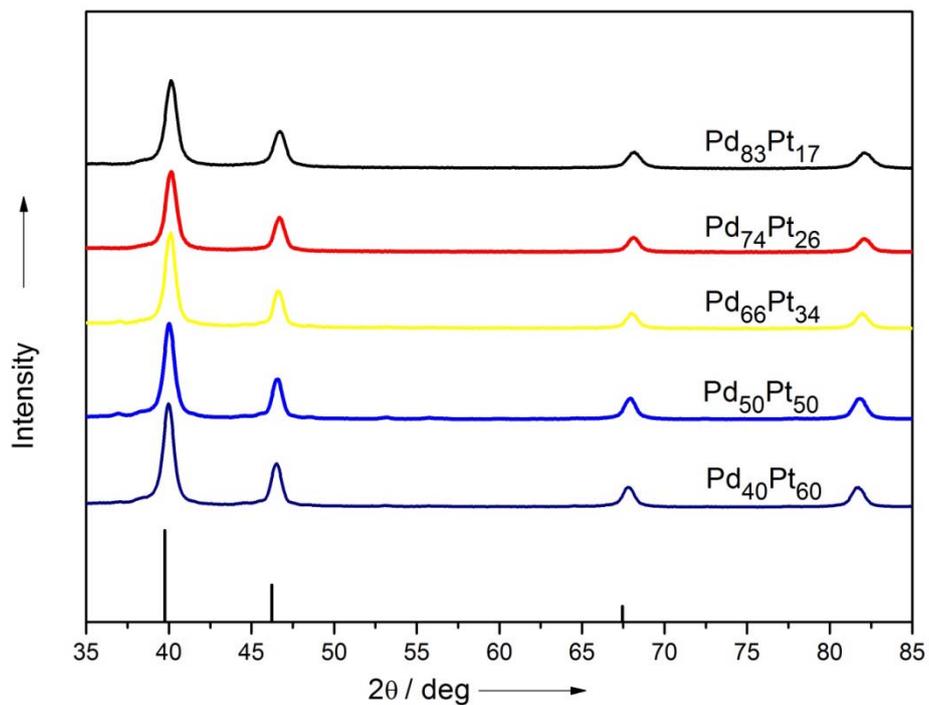


Figure S4. XRD of the Pd-Pt alloy concave nanocubes with five different Pd/Pt atomic ratios

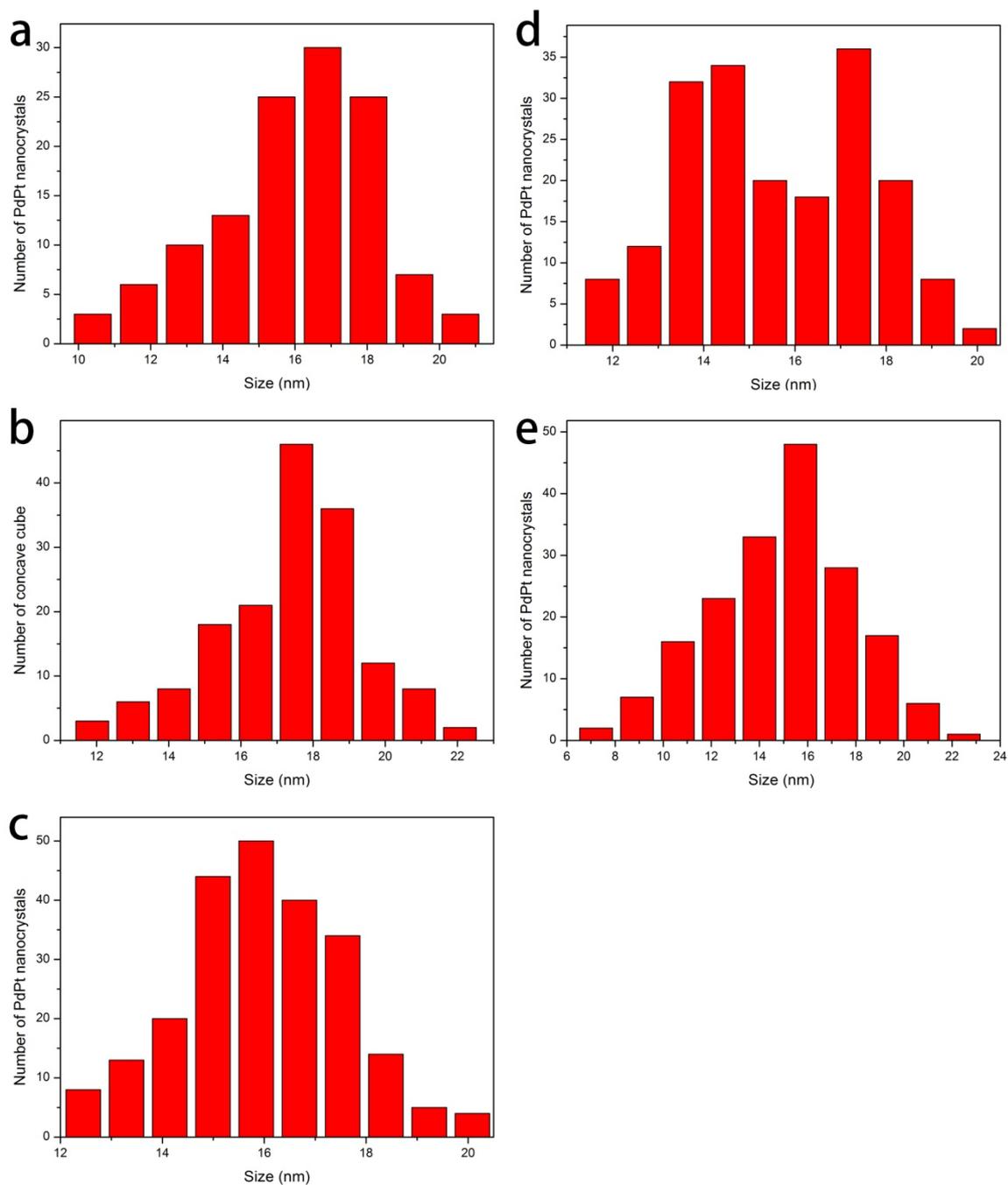


Figure S5. The size distribution of the Pd-Pt alloy concave nanocubes with five different Pd/Pt atomic ratios: (a) Pd₄₀Pt₆₀, (b) Pd₅₀Pt₅₀, (c) Pd₆₆Pt₃₄, (d) Pd₇₄Pt₂₆, and (e) Pd₈₃Pt₁₇.

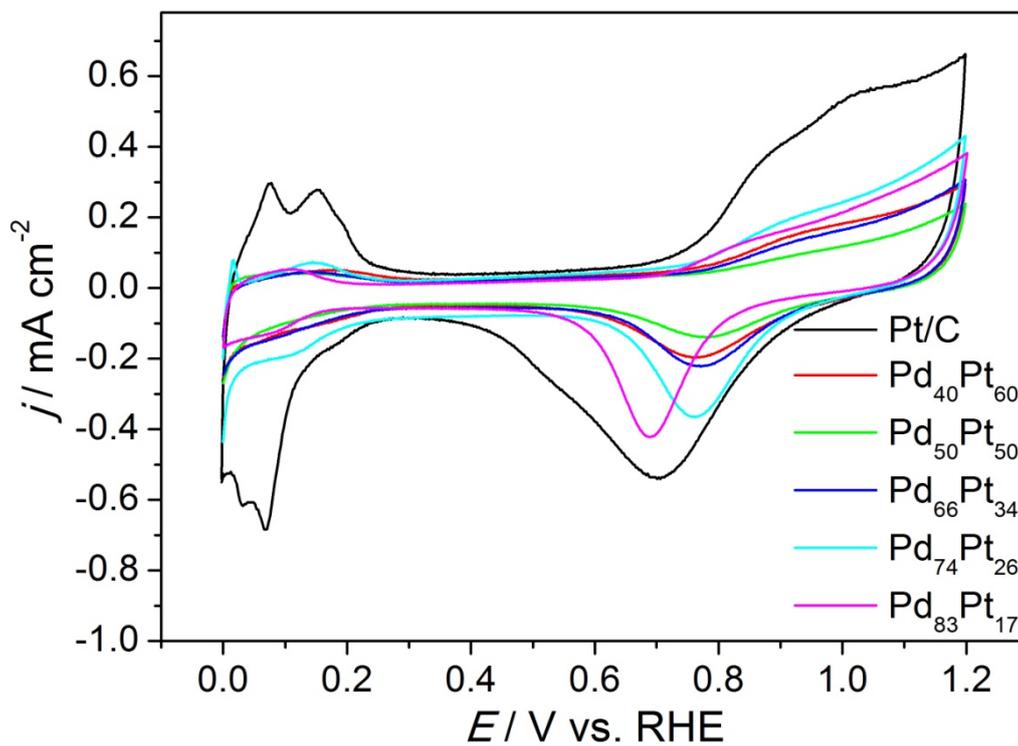


Figure S6. Cyclic voltammograms (CVs) of the commercial Pt/C and Pd-Pt concave nanocubes with five different Pd/Pt atomic ratios in a N_2 -saturated 0.5 M H_2SO_4 solution.