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Ternary Pt-Pd-Ag alloy nanoflowers for oxygen reduction reaction electrocatalysis

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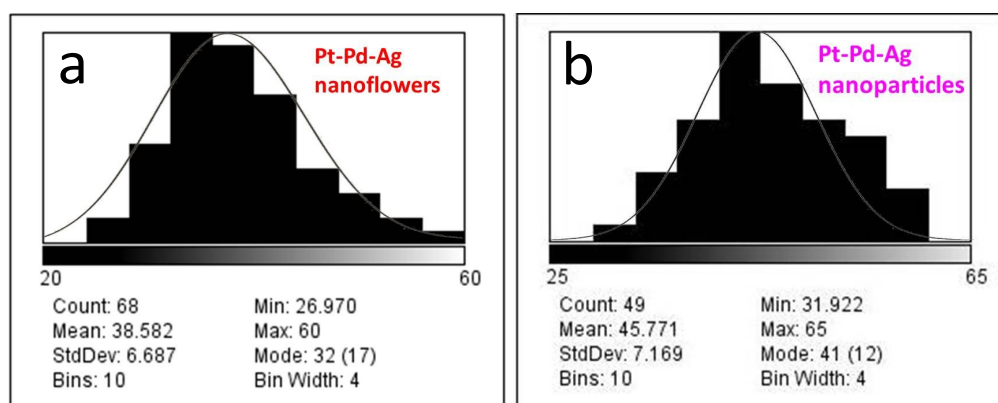


Fig. S1 Particle size Gaussian normal distribution of (a) Pt-Pd-Ag alloy nanoflowers and (b) irregularly-shaped nanoparticles.

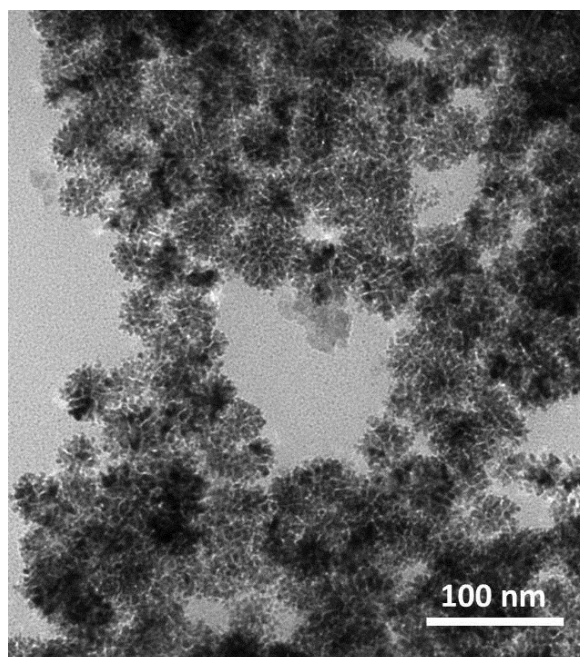


Fig. S2 Low magnification TEM micrograph of Pt-Pd-Ag nanoflowers before heat treatment.

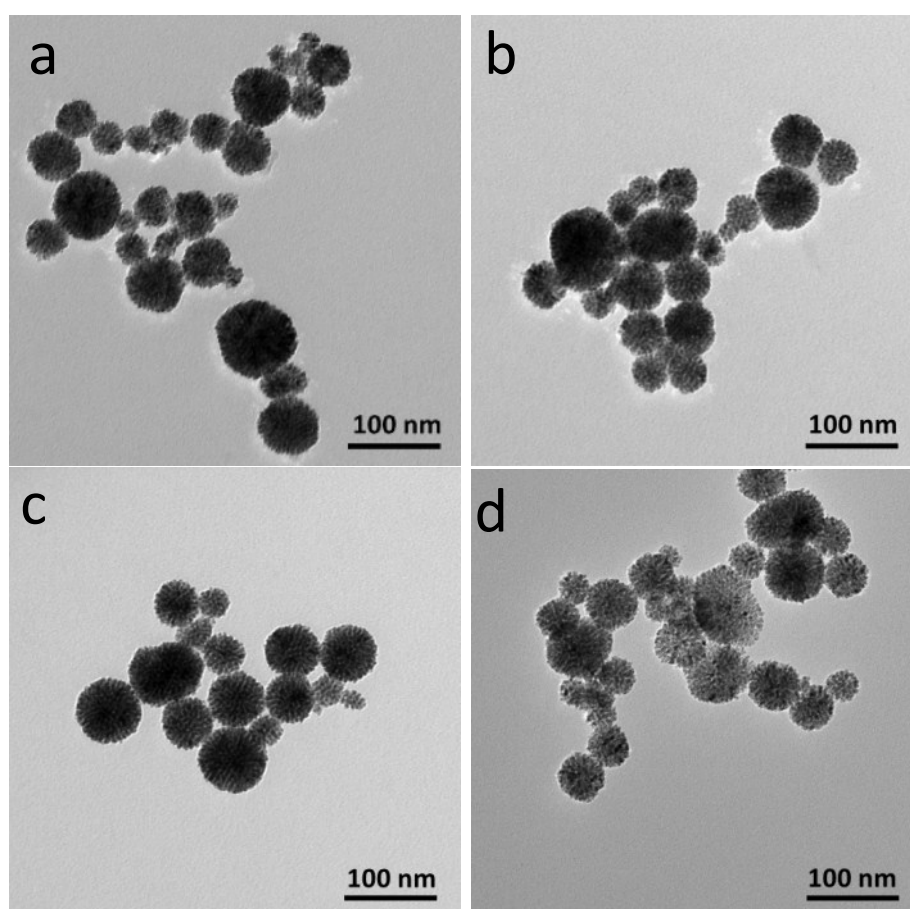


Fig. S3 Low magnification TEM micrographs of time study. Duration of heating treatment at 95 °C:

(a) 15 min, (b) 30 min, (c) 1 hour, (d) 2 hours.

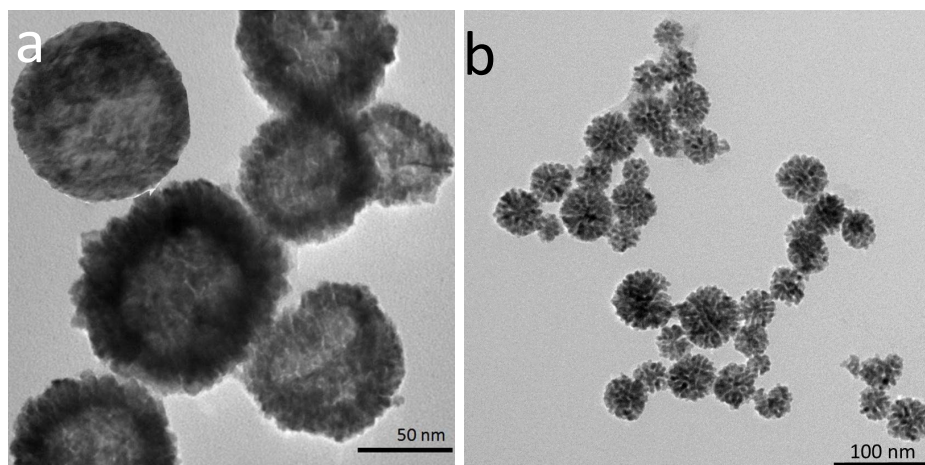


Fig. S4 Low magnification TEM micrographs of bi-metallic nanostructures after heat treatment of 2 h at 95 °C prepared in absence of: (a) Pd-precursor Na_2PdCl_4 , (b) Pt-precursor K_2PtCl_4 .

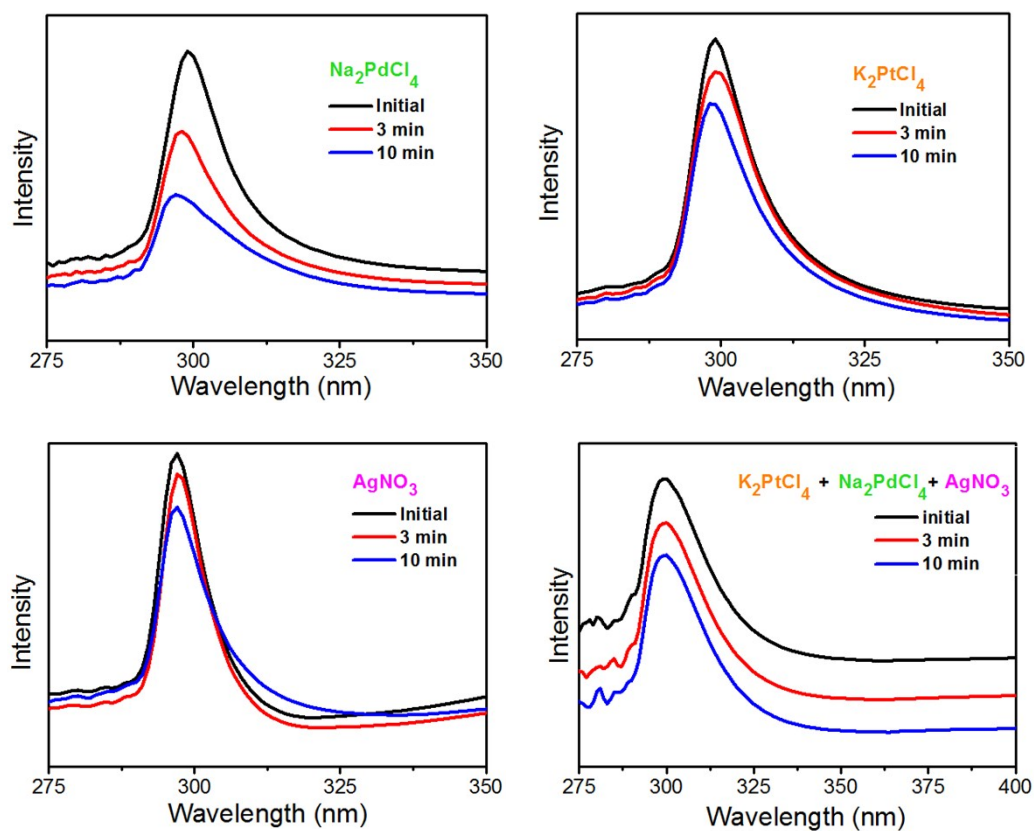


Figure S5 Time-dependent UV-vis extinction spectra of the aqueous HMTA + CTAC + AA mixtures containing (a) Na_2PdCl_4 , (b) K_2PtCl_4 , (c) AgNO_3 , and (d) $\text{K}_2\text{PtCl}_4 + \text{Na}_2\text{PdCl}_4 + \text{AgNO}_3$.

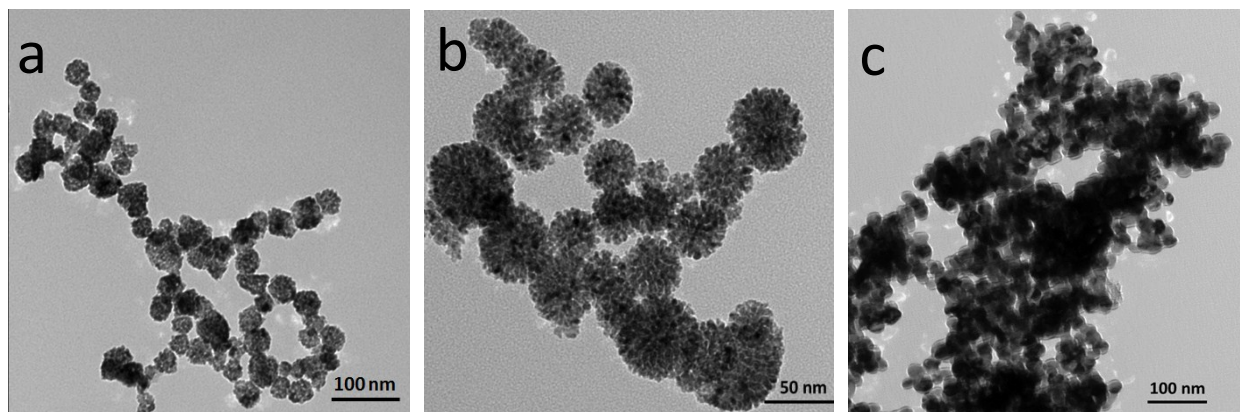


Fig. S6 Low magnification TEM micrographs of Pt-Pd-Ag nanoflowers after heat treatment of 2 h at 95 °C prepared without: (a) HMTA, (b) CTAC, (c) AA.

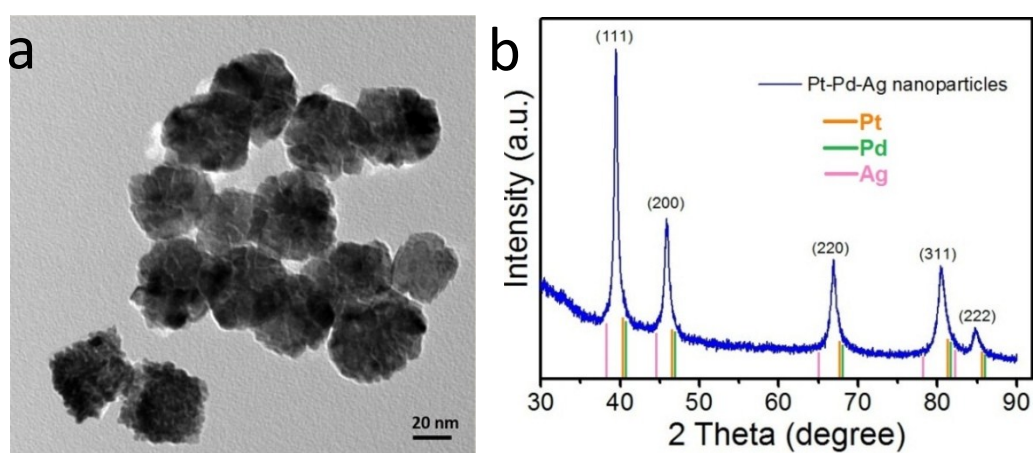


Fig. S7 (a) Low magnification TEM micrograph of Pt-Pd-Ag nanoparticles with irregular shape and (b) Powder XRD pattern.

Table S1 Comparison of the elemental ratios in the catalysts inks based on ICP-OES analysis of the Pt-Pd-Ag/C nanoflowers (NFs) and irregularly-shaped nanoparticles (NPs).

Element	Morphology	Ag	Pd	Pt
Unit		wt%	wt%	wt%
Average Value	NFs	28.88	25.94	45.18
	NPs	32.77	18.96	48.27
Standard Deviation	NFs	0.36	0.17	0.47
	NPs	0.35	0.13	0.52
%Relative Standard Deviation	NFs	0.4246	0.2227	0.3527
	NPs	0.3616	0.2478	0.3906