

Supplementary Information

One-pot synthesis of RGO-supported ultrafine ternary PtAuRu catalyst with high electrocatalytic activity towards methanol oxidation in alkaline medium

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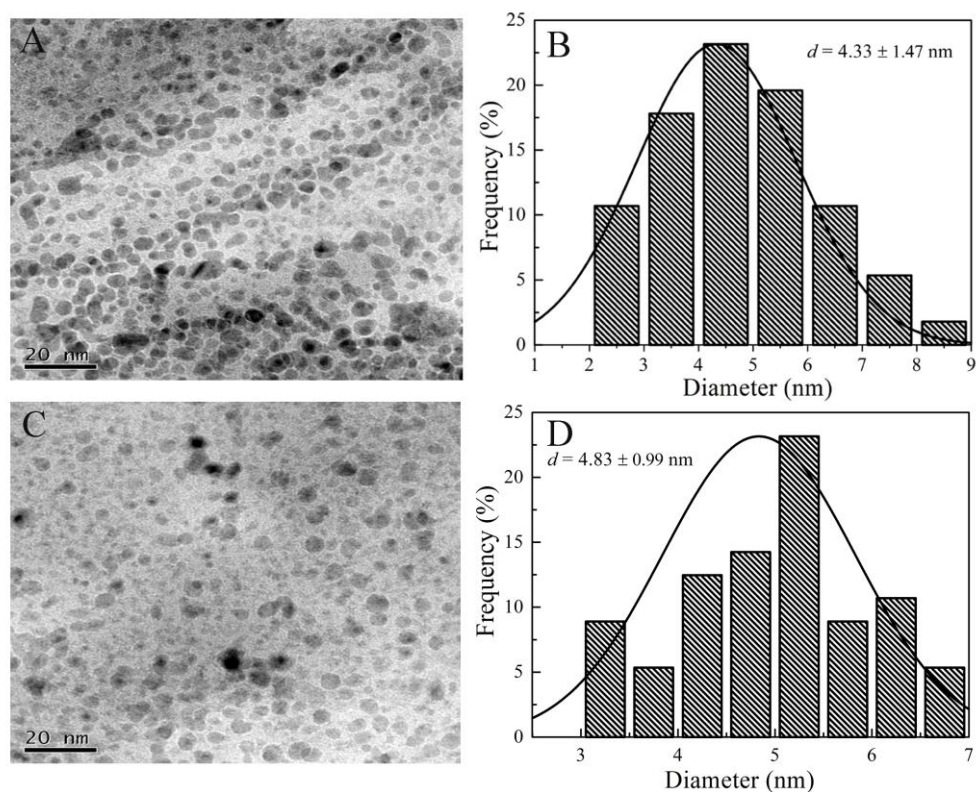


Fig. S1 TEM images of PtAu/RGO (A) and PtRu/RGO catalyst (C); histogram of the size of the PtAu (B) and PtRu nanoparticles (D).

Fig. S1 shows the TEM images of PtAu/RGO (A) and PtRu/RGO catalyst (C). It can be seen that PtAu and PtRu nanoparticles are uniformly distributed on the RGO

surface without obvious agglomerations. In addition, the particle size distribution of PtAu/RGO (B) and PtRu/RGO catalyst (D) shows that the average diameter of PtAu and PtRu nanoparticles are 4.33 ± 1.47 nm and 4.83 ± 0.99 nm, respectively.

Table S1 Summary of the size and composition data for the catalysts

Catalysts	Metal loading ($\mu\text{g cm}^{-2}$) of			Yield (%)			Molar ratio	Particle diameter by TEM (nm)
	four electrodes			Pt	Au	Ru		
	Pt	Au	Ru					
Pt/RGO	12.2	—	—	98%	—	—	—	—
PtAu/RGO	12.2	11.9	—	98%	95%	—	1.00:0.97	4.33 ± 1.47
PtRu/RGO	12.2	—	3.0	98%	—	46%	1.00:0.47	4.83 ± 0.99
PtAuRu/RGO	12.2	12.0	3.1	98%	96%	48%	1.00:0.98:0.50	3.09 ± 0.73