Supporting Information

De-alloyed PtCu/C Catalysts with Enhanced Electrocatalytic Performance for Oxygen Reduction Reaction

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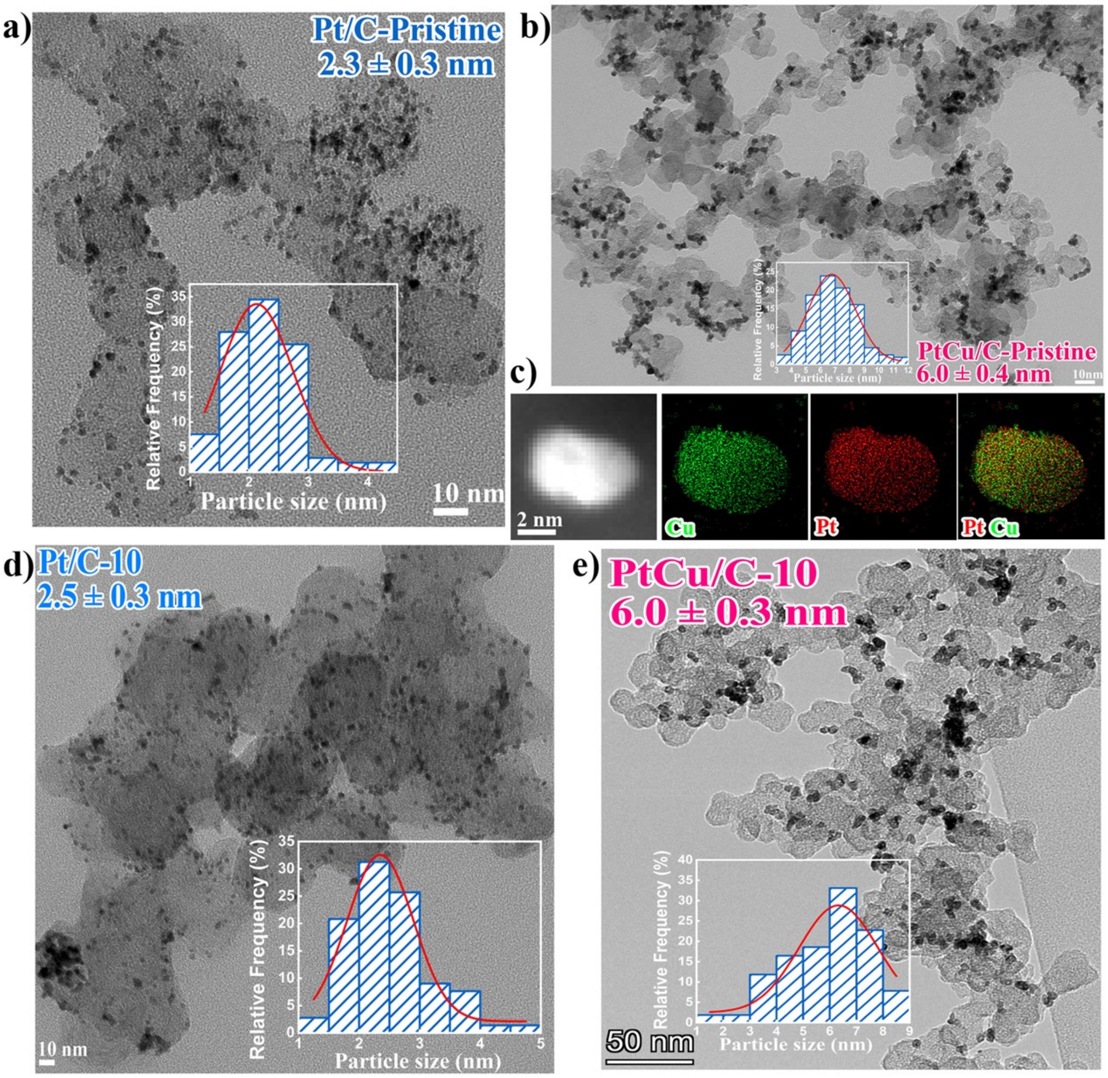

Figure S1. TEM images of Pt/C-Pristine (a), PtCu/C-Pristine (b), and Pt/C-10 (d) and PtCu/C-10 (e), and HAADF-STEM overview images and EDS-HAADF-STEM element mapping images of PtCu/C-Pristine (c). Insert: Its corresponding particle size distribution histogram.

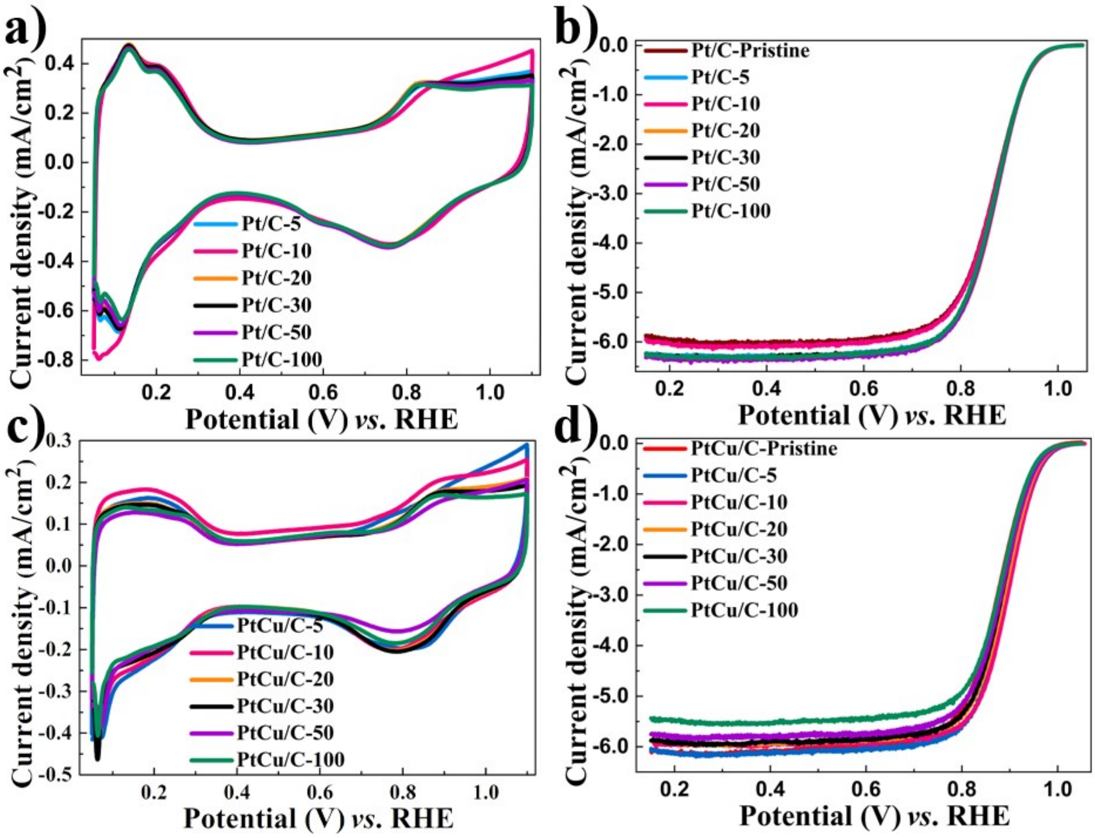

Figure S2. Cyclic voltammograms in deoxygenated 0.1 M $HClO_4$ at a scan rate of 50 mV·s^{-1}, and ORR polarization curves in O_2-saturated 0.1 M $HClO_4$ at a rotation rate of 1600 rpm and a scan rate of 10 mV·s^{-1} for Pt/C (a-b) and for PtCu/C (c-d).

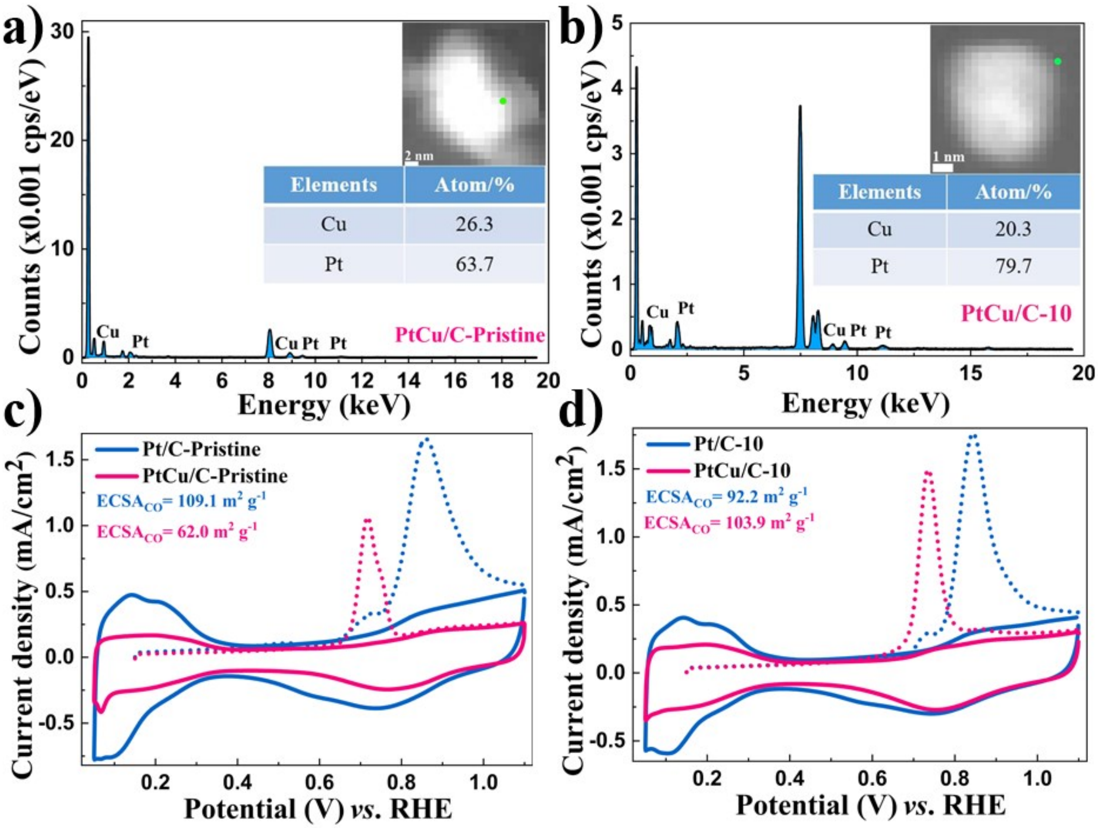

Figure S3. EDS spectrum of PtCu/C-Pristine (a) and PtCu/C-10 (b). CO-stripping cyclic valtommograms for catalysts in 0.1 M $HClO_4$ measured at a scan rate of 50 mV·s^{-1} at room temperature for PtCu/C-Pristine and Pt/C-Pristine (c) as well as Pt/C-10 and PtCu/C-10 (d).

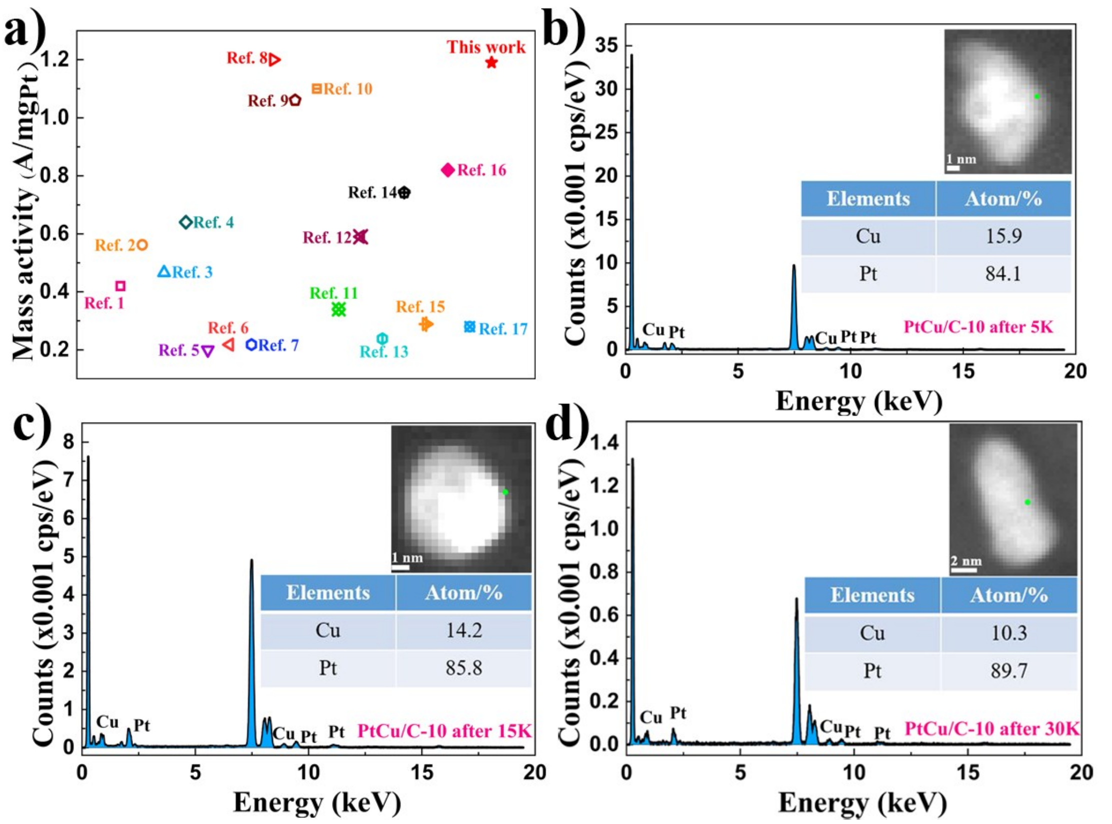

Figure S4. Comparison on mass activities at 0.90 V (*vs*. RHE) for PtCu/C-10 with previous reported literature (a). EDS spectrum of PtCu/C-10 after 5K (b), 15K (c) and 30K (d).

Table S1. Comparison of ORR performance and ECSA for catalysts.

Samples	ECSA (m^2 g^{-1})	ORR at 0.90 V		ORR at 0.85 V	
	H_{upd}	MA (A mg^{-1}_{Pt})	SA (mA cm^{-2})	MA (A mg^{-1}_{Pt})	SA (mA cm^{-2})
Pt/C-Pristine	N/A	0.23	N/A	0.93	N/A
Pt/C-5	83.2	0.24	0.29	0.94	1.13
Pt/C-10	90.3	0.24	0.26	0.94	1.04
Pt/C-20	82.5	0.24	0.29	0.95	1.15
Pt/C-30	82.7	0.24	0.29	0.95	1.15
Pt/C-50	81.0	0.24	0.30	0.95	1.17
Pt/C-100	78.8	0.23	0.29	0.94	1.19
PtCu/C-Pristine	N/A	0.64	N/A	2.56	N/A
PtCu/C-5	59.1	1.09	1.84	4.66	7.88
PtCu/C-10	70.5	1.19	1.69	5.44	7.72
PtCu/C-20	57.2	0.94	1.64	4.11	7.19
PtCu/C-30	54.9	0.81	1.47	3.72	6.78
PtCu/C-50	47.4	0.81	1.71	3.34	7.05
PtCu/C-100	50.0	0.70	1.40	3.05	6.10

Table S2. Composition of PtCu/C catalysts measured by ICP-OES.

Samples	Metallic loading			Atomic ratio	
	Pt/%	Cu/%	Pt+Cu/%	Pt/%	Cu/%
PtCu/C-Pristine	11.8	5.4	17.2	41.8	58.2
PtCu/C-5	10.3	2.0	12.3	62.8	37.2
PtCu/C-10	10.4	1.9	12.3	64.2	35.8
PtCu/C-20	10.9	1.8	12.7	66.5	33.5
PtCu/C-30	10.0	1.7	11.7	65.9	34.1
PtCu/C-50	9.8	1.6	11.4	66.8	33.2
PtCu/C-100	10.9	1.6	12.5	69.1	30.9
PtCu/C-10 after 5K	11.5	1.6	13.1	70.2	29.8
PtCu/C-10 after 15K	10.9	1.3	12.2	73.3	26.7
PtCu/C-10 after 30K	11.6	1.4	13.0	73.1	26.9

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