Electronic Supplementary Information (ESI)

Mechanically resilient electrospun TiC nanofibrous mats surface-decorated with Pt nanoparticles for oxygen reduction reaction with enhanced electrocatalytic activities

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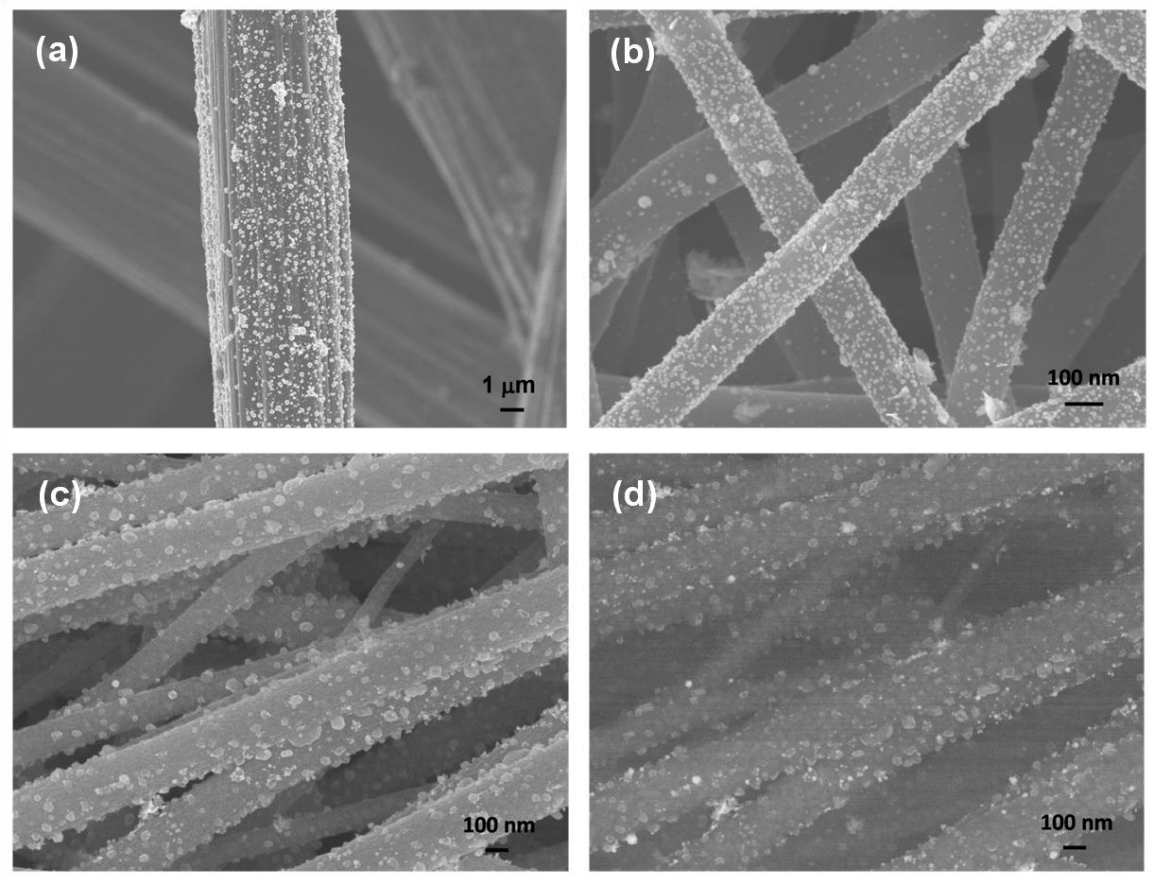

Figure S1. Representative SEM images of Pt NPs decorated on the surfaces of (a) carbon paper, (b) ECNF mat, and (c) TiC mat; (d) back-scattered electron image of (c).

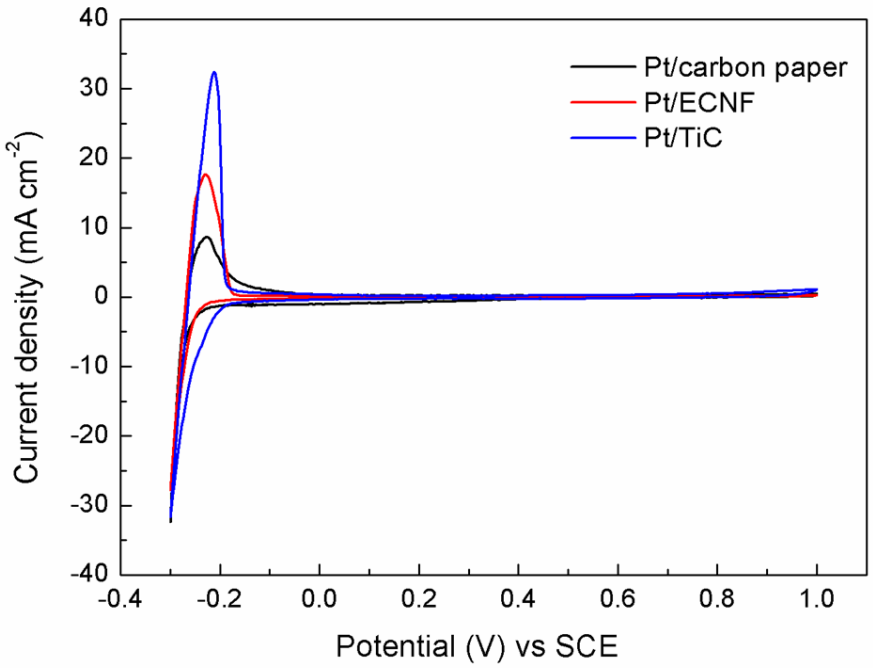

Figure S2. Cyclic voltammograms of the electrocatalytic systems of Pt/carbon paper, Pt/ECNF, and Pt/TiC in 0.5 M H_2SO_4 solution at the scan rate of 50 mV/s.

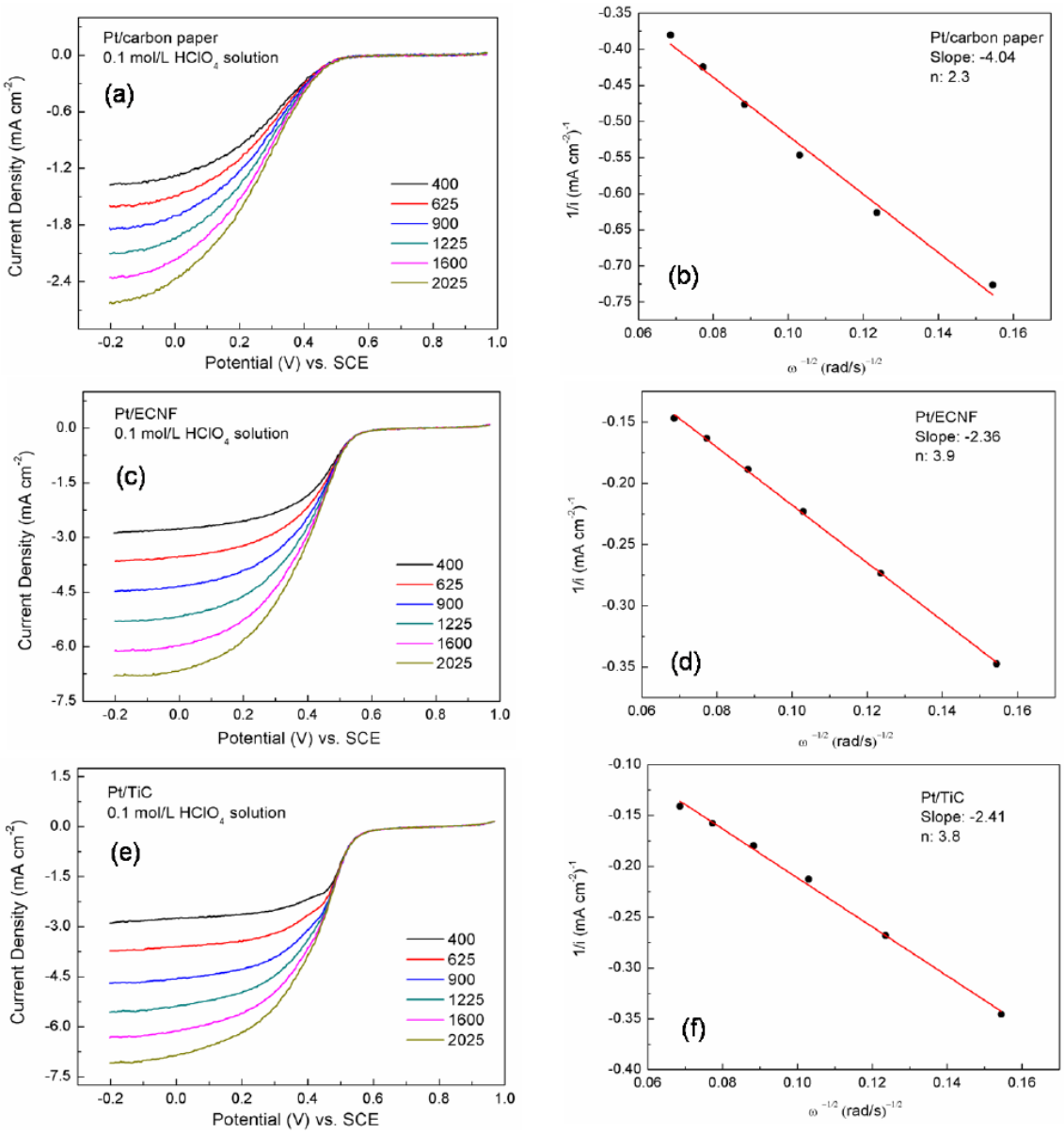

Figure S3. Polarization curves for the electrocatalytic systems of (a) Pt/carbon paper, (c) Pt/ECNF, and (e) Pt/TiC for ORR in 0.1 M $HClO_4$ scanned at 5 mV/s with different rotating rates, and the corresponding Koutecky-Levich plots of (b), (d), and (f).

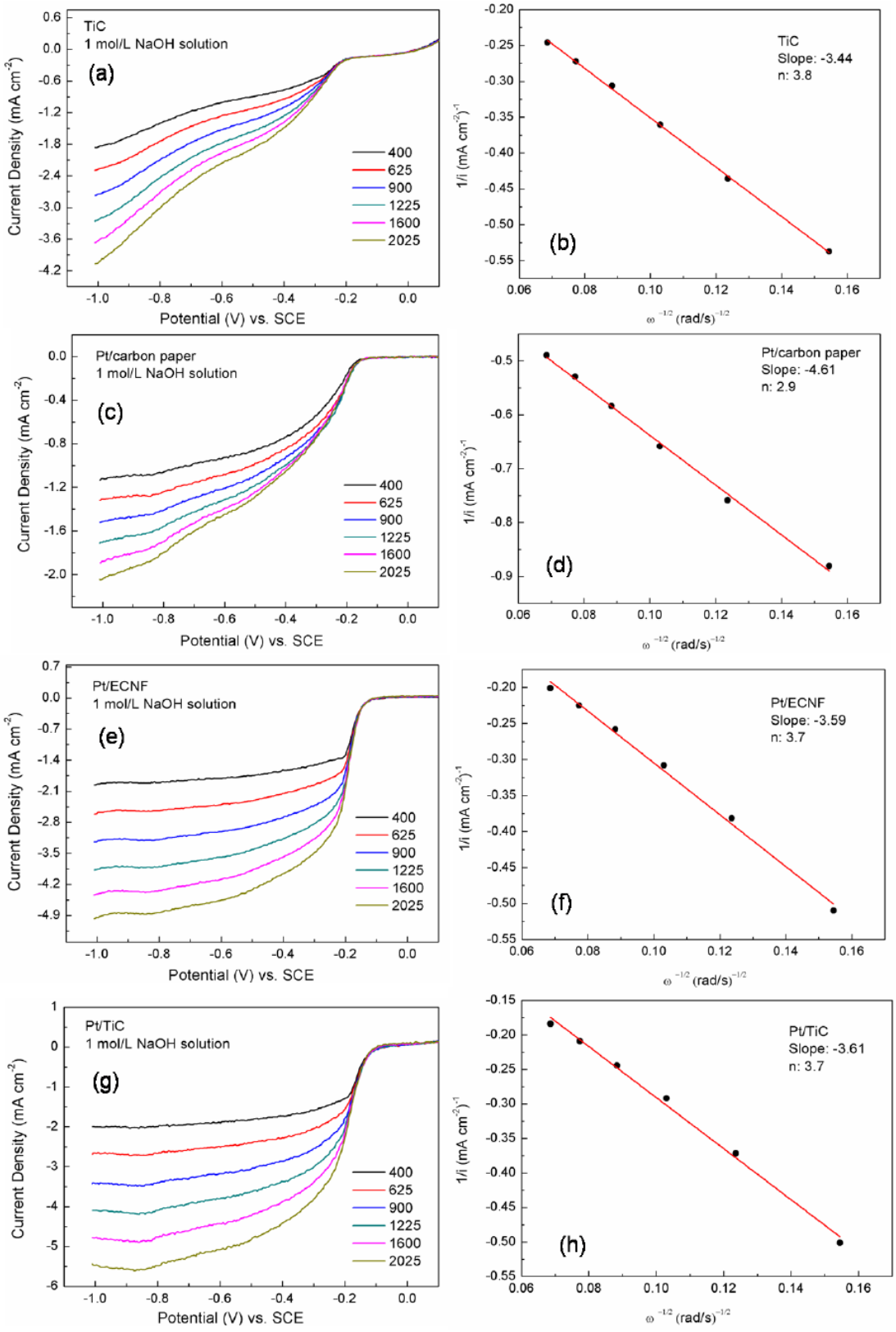

Figure S4. Polarization curves for the electrocatalytic systems of (a) TiC, (c) Pt/carbon paper, (e) Pt/ECNF, and (g) Pt/TiC for ORR in 1.0 M NaOH scanned at 5 mV/s with different rotating rates, and the corresponding Koutecky-Levich plots of (b), (d), (f), and (h).

Table S1. Electrochemical parameters for ORR obtained from polarization curves at 1600 rpm in 0.1 M $HClO_4$ solution.

	On-set potential [V vs. SCE]	Half-wave potential [V vs. SCE]	Current density (at $E_{half\text{-}wave}$) [mA/cm^2]	Transferred electron number	Tafel slope [mV/dec]
Pt/carbon paper	0.46	0.26	-1.05	2.3	-108/-137
Pt/ECNF	0.56	0.39	-2.74	3.9	-76/-122
Pt/TiC	0.62	0.44	-2.77	3.8	-74/-120

Table S2. Electrochemical parameters for ORR obtained from polarization curves at 1600 rpm in 1.0 M NaOH solution.

	On-set potential [V vs. SCE]	Half-wave potential [V vs. SCE]	Current density (at $E_{half\text{-}wave}$) [mA/cm^2]	Transferred electron number	Tafel slope [mV/dec]
TiC nanofiber	-0.20	-	-	3.8	-61
Pt/carbon paper	-0.16	-0.32	-0.82	2.9	-46
Pt/ECNF	-0.14	-0.20	-1.99	3.7	-39
Pt/TiC	-0.11	-0.19	-2.07	3.7	-46